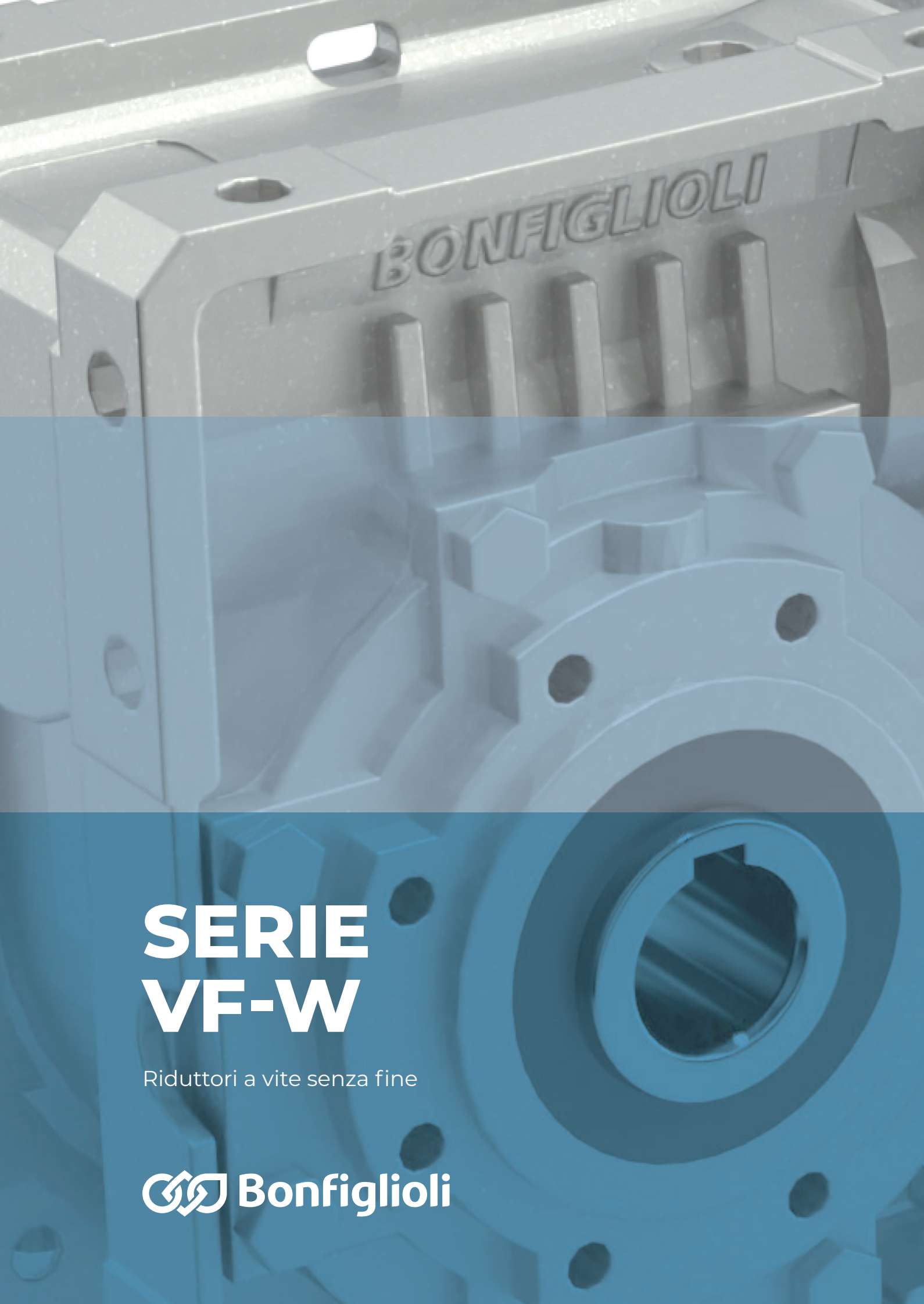




BONFIGLIOLI

# SERIE VF-W

Riduttori a vite senza fine

 **Bonfiglioli**





| Parag.                                | Descrizione                                                               | Pagina | Parag.                                                                                | Descrizione                                        | Pagina |
|---------------------------------------|---------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------|----------------------------------------------------|--------|
| <b>INFORMAZIONI GENERALI</b> 2        |                                                                           |        | <b>VF-EP / W-EP - RIDUTTORI E MOTORIDUTTORI PER AMBIENTI CORROSIVI E ASETTICI</b> 187 |                                                    |        |
| 1                                     | Simbologia e unità di misura                                              | 2      | 33                                                                                    | I vantaggi dell'esecuzione EP per l'industria      | 187    |
| 2                                     | Definizioni                                                               | 3      | 34                                                                                    | Designazione                                       | 190    |
| 3                                     | Temperature limite ammesse                                                | 6      | 35                                                                                    | Opzioni riduttore                                  | 192    |
| 4                                     | Selezione                                                                 | 7      | 36                                                                                    | Opzioni motori                                     | 192    |
| 5                                     | Verifiche                                                                 | 9      | 37                                                                                    | Altre informazioni sui riduttori e i motoriduttori | 193    |
| 6                                     | Installazione                                                             | 9      | 38                                                                                    | Gli accessori della serie EP                       | 193    |
| 7                                     | Lubrificazione                                                            | 11     |                                                                                       |                                                    |        |
| 8                                     | Stoccaggio                                                                | 12     |                                                                                       |                                                    |        |
| 9                                     | Condizioni di fornitura                                                   | 12     |                                                                                       |                                                    |        |
|                                       |                                                                           |        | <b>DISPOSITIVO FINE-CORSA RVS</b> 195                                                 |                                                    |        |
| <b>RIDUTTORI A VITE SENZA FINE</b> 13 |                                                                           |        | 39                                                                                    | Informazioni generali                              | 195    |
| 10                                    | Caratteristiche costruttive                                               | 13     | 40                                                                                    | Codici per l'ordinamento                           | 196    |
| 11                                    | Forme costruttive                                                         | 14     | 41                                                                                    | Designazione                                       | 197    |
| 12                                    | Esecuzione di montaggio                                                   | 15     | 42                                                                                    | Tabelle di selezione motoriduttore                 | 198    |
| 13                                    | Designazione                                                              | 18     | 43                                                                                    | Dimensioni                                         | 201    |
| 14                                    | Opzioni riduttore                                                         | 20     | 44                                                                                    | Opzioni                                            | 205    |
| 15                                    | Posizioni di montaggio e orientamento morsettiera                         | 26     |                                                                                       |                                                    |        |
| 16                                    | Carichi radiali                                                           | 35     | <b>MOTORI ELETTRICI</b> 206                                                           |                                                    |        |
| 17                                    | Carichi assiali                                                           | 36     | M1                                                                                    | Simbologia e unità di misura                       | 206    |
| 18                                    | Rendimento                                                                | 39     | M2                                                                                    | Caratteristiche generali                           | 207    |
| 19                                    | Irreversibilità                                                           | 39     | M3                                                                                    | Caratteristiche meccaniche                         | 210    |
| 20                                    | Giochi angolari                                                           | 41     | M4                                                                                    | Caratteristiche elettriche                         | 214    |
| 21                                    | Dati tecnici motoriduttori                                                | 42     | M5                                                                                    | Motori asincroni autofrenanti                      | 221    |
| 22                                    | Tabelle dati tecnici riduttori                                            | 73     | M6                                                                                    | Motori autofrenanti in c.c., tipo BN e M_FD        | 222    |
| 23                                    | Combinazioni dei rapporti nei riduttori combinati serie VF/VF, VF/W, W/VF | 95     | M7                                                                                    | Motori autofrenanti in c.a., tipo BN e M_FA        | 226    |
| 24                                    | Predisposizioni motore                                                    | 96     | M8                                                                                    | Sistemi di sblocco freno                           | 229    |
| 25                                    | Momento d'inerzia                                                         | 99     | M9                                                                                    | Opzioni                                            | 231    |
| 26                                    | Dimensioni motoriduttori e riduttori predisposti IEC                      | 111    | M10                                                                                   | Dati tecnici motori                                | 244    |
| 27                                    | Dimensioni riduttori con ingresso HS                                      | 177    | M11                                                                                   | Dimensioni                                         | 261    |
| 28                                    | Dimensioni riduttori con braccio di reazione                              | 181    |                                                                                       |                                                    |        |
| 29                                    | Dimensioni riduttori con cappellotto di protezione                        | 181    |                                                                                       |                                                    |        |
| 30                                    | Accessori                                                                 | 182    |                                                                                       |                                                    |        |
| 31                                    | Albero cliente                                                            | 183    |                                                                                       |                                                    |        |
| 32                                    | Limitatore di coppia                                                      | 184    |                                                                                       |                                                    |        |

#### Revisioni

L'indice di revisione del catalogo è riportato a pag. 270 Al sito [www.bonfiglioli.com](http://www.bonfiglioli.com) sono disponibili i cataloghi con le revisioni aggiornate.



## INFORMAZIONI GENERALI

### 1 SIMBOLOGIA E UNITÀ DI MISURA

| Simbolo      | Unità di misura     | Descrizione                          | Simbolo                                | Unità di misura      | Descrizione                              |
|--------------|---------------------|--------------------------------------|----------------------------------------|----------------------|------------------------------------------|
| $A_{N\ 1,2}$ | [N]                 | Carico assiale nominale              | $n_{1,2}$                              | [min <sup>-1</sup> ] | Velocità                                 |
| $f_s$        | —                   | Fattore di servizio                  | $P_{1,2}$                              | [kW]                 | Potenza                                  |
| $f_T$        | —                   | Fattore termico                      | $P_{N\ 1,2}$                           | [kW]                 | Potenza nominale                         |
| $f_{TP}$     | —                   | Fattore di temperatura               | $P_{R\ 1,2}$                           | [kW]                 | Potenza richiesta                        |
| $i$          | —                   | Rapporto di trasmissione             | $R_{C\ 1,2}$                           | [N]                  | Carico radiale di calcolo                |
| $I$          | —                   | Rapporto di intermittenza            | $R_{N\ 1,2}$                           | [N]                  | Carico radiale nominale                  |
| $J_C$        | [Kgm <sup>2</sup> ] | Momento di inerzia carico            | $S$                                    | —                    | Fattore di sicurezza                     |
| $J_M$        | [Kgm <sup>2</sup> ] | Momento di inerzia motore            | $t_a$                                  | [°C]                 | Temperatura ambiente                     |
| $J_R$        | [Kgm <sup>2</sup> ] | Momento di inerzia riduttore         | $t_s$                                  | [°C]                 | Temperatura superficiale                 |
| $K$          | —                   | Fattore di accelerazione delle masse | $t_o$                                  | [°C]                 | Temperatura dell'olio                    |
| $K_r$        | —                   | Costante di trasmissione             | $t_f$                                  | [min]                | Tempo di funzionamento a carico costante |
| $M_{1,2}$    | [Nm]                | Coppia                               | $t_r$                                  | [min]                | Tempo di riposo                          |
| $M_{c\ 1,2}$ | [Nm]                | Coppia di calcolo                    | $\eta_d$                               | —                    | Rendimento dinamico                      |
| $M_{n\ 1,2}$ | [Nm]                | Coppia nominale                      | $\eta_s$                               | —                    | Rendimento statico                       |
| $M_{r\ 1,2}$ | [Nm]                | Coppia richiesta                     | $_1$ valore riferito all'albero veloce |                      |                                          |
|              |                     |                                      | $_2$ valore riferito all'albero lento  |                      |                                          |



Questo simbolo indica informazioni tecniche di particolare importanza da non trascurare.



Questo simbolo riporta i riferimenti angolari per l'indicazione della direzione del carico radiale (l'albero è visto di fronte).



Questo simbolo indica situazioni di grave pericolo che, se trascurate, possono mettere seriamente a rischio la salute e la sicurezza delle persone.



Simbolo riferito al peso dei riduttori e dei motoriduttori.  
I valori riportati nelle tabelle dei motoriduttori sono comprensivi sia del peso del motore a 4 poli sia del peso del lubrificante contenuto, qualora previsto da BONFIGLIOLI RIDUTTORI.



Il simbolo identifica la pagina alla quale può essere reperita l'informazione.

## 2 DEFINIZIONI

### 2.1 COPPIA

#### Coppia nominale $M_{n2}$ [Nm]

È la coppia trasmissibile in uscita con carico continuo uniforme, riferita alla velocità in ingresso  $n_1$  e a quella corrispondente in uscita  $n_2$ .

È calcolata in base ad un fattore di servizio  $f_s = 1$ .

#### Coppia richiesta $M_{r2}$ [Nm]

Rappresenta la coppia richiesta dall'applicazione e dovrà sempre essere uguale o inferiore alla coppia in uscita nominale  $M_{n2}$  del riduttore.

#### Coppia di calcolo $M_{c2}$ [Nm]

È il valore di coppia da utilizzare per la selezione del riduttore considerando la coppia richiesta  $M_{r2}$  e il fattore di servizio  $f_s$  ed è dato dalla formula:

$$M_{c2} = M_{r2} \times f_s \leq M_{n2} \quad (1)$$

### 2.2 POTENZA

#### Potenza nominale in entrata $P_{n1}$ [kW]

Il parametro è riscontrabile nelle tabelle dei dati tecnici nominali e rappresenta la potenza applicabile al riduttore in relazione alla velocità di comando  $n_1$  e al fattore di servizio  $f_s = 1$ .



## 2.3 RENDIMENTO

### Rendimento dinamico [ $\eta_d$ ]

Si definisce come il rapporto fra la potenza in uscita  $P_2$  e quella in entrata  $P_1$ :

$$\eta_d = \frac{P_2}{P_1} \quad (2)$$

È opportuno evidenziare che i valori di coppia nominale  $M_{n2}$  sono calcolati tenendo conto del rendimento dinamico  $\eta_d$  che si produce al termine della fase di rodaggio dei riduttori.

Dopo il rodaggio si ha anche una riduzione e infine una stabilizzazione della temperatura di funzionamento. La temperatura sotto carico è influenzata dal tipo di servizio e dalla temperatura ambiente, riferirsi al capitolo “TEMPERATURE LIMITE AMMESSE” per indicazioni sui valori consentiti. Se c'è motivo di attendersi temperature di funzionamento vicine al limite massimo consentito, è opportuno equipaggiare il riduttore di anelli di tenuta in fluoro-elastomero, specificando nell'ordinativo l'opzione **PV**.

### Rendimento statico [ $\eta_s$ ]

È il rendimento applicabile all'avviamento del riduttore. Il parametro non è generalmente rilevante nel caso di ingranaggi elicoidali, ma deve essere tenuto in particolare considerazione nella scelta di motorizzazioni a vite senza fine, quando questi operano con un tipo di servizio intermittente (es. Sollevamenti).

## 2.4 RAPPORTO DI RIDUZIONE [ $i$ ]

Il valore del rapporto di riduzione della velocità, identificato con il simbolo [  $i$  ], è espresso tramite il rapporto fra le velocità all'albero veloce e lento del riduttore e riassunto nell'espressione:

$$i = \frac{n_1}{n_2} \quad (3)$$

## 2.5 MOMENTO D'INERZIA $J_r$ [kgm<sup>2</sup>]

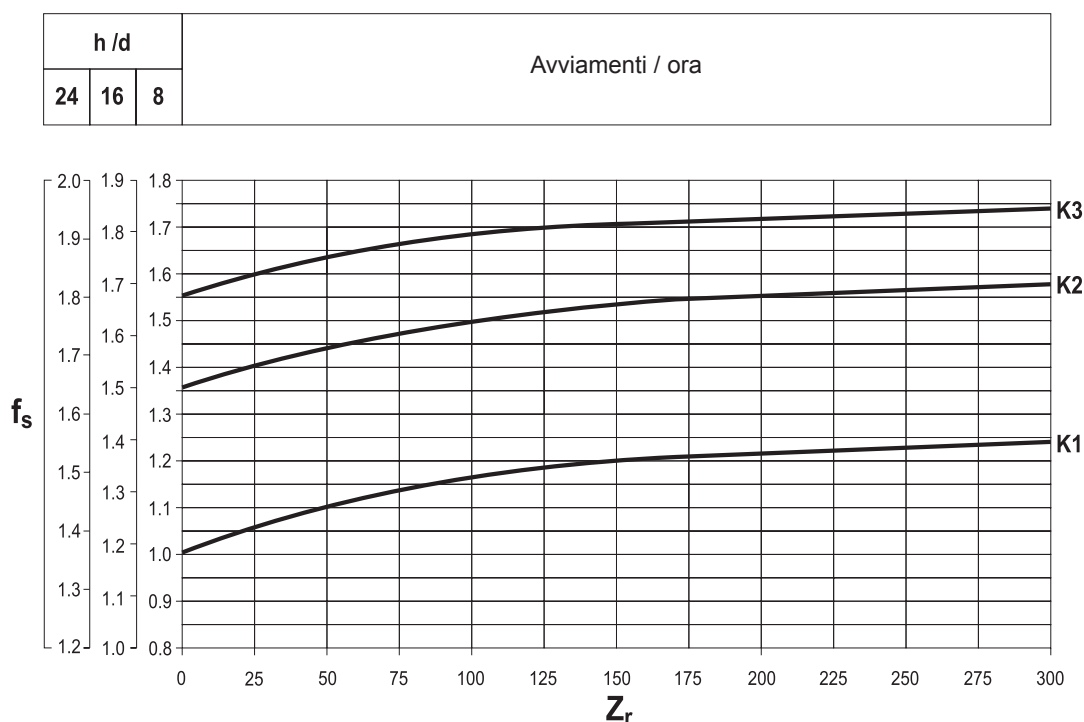
I momenti d'inerzia indicati a catalogo sono riferiti all'albero veloce del riduttore e pertanto, nell'accoppiamento con un motore elettrico, il loro valore si somma semplicemente a quello del motore stesso.



## 2.6 FATTORE DI SERVIZIO [ $f_s$ ]

Il fattore di servizio è il parametro che traduce in un valore numerico la gravosità del servizio che il riduttore è chiamato a svolgere, tenendo conto, benché con inevitabile approssimazione, del funzionamento giornaliero, della variabilità del carico e di eventuali sovraccarichi, connessi con la specifica applicazione del riduttore. Nel grafico seguente riportato il fattore di servizio si ricava, dopo aver selezionato la colonna relativa alle ore di funzionamento giornaliere, per intersezione fra il numero di avviamenti orari e una fra le curve K1, K2 e K3.

Le curve K\_ sono associate alla natura del servizio (approssimativamente: uniforme, medio e pesante) tramite il fattore di accelerazione delle masse K, legato al rapporto fra le inerzie delle masse condotte e del motore. Indipendentemente dal valore così ricavato del fattore di servizio, segnaliamo che esistono applicazioni fra le quali, a puro titolo di esempio i sollevamenti, per le quali il cedimento di un organo del riduttore potrebbe esporre il personale che opera nelle immediate vicinanze a rischio di ferimento. Se esistono dubbi che l'applicazione possa presentare questa criticità vi invitiamo a consultare preventivamente il ns. Servizio Tecnico.



### Fattore di accelerazione delle masse, [ K ]

Il parametro serve a selezionare la curva relativa al particolare tipo di carico. Il valore è dato dal rapporto:

$$K = \frac{J_c}{J_m} \quad (4)$$

|                       |   |                                                                             |
|-----------------------|---|-----------------------------------------------------------------------------|
| $K = \frac{J_c}{J_m}$ | → | $J_c =$ Momento d'inerzia delle masse comandate, riferito all'albero motore |
|                       |   | $J_m =$ Momento d'inerzia del motore                                        |

|                   |      |                                               |
|-------------------|------|-----------------------------------------------|
| $K \leq 0,25$     | → K1 | Carico uniforme                               |
| $0,25 < K \leq 3$ | → K2 | Carico con urti moderati                      |
| $3 < K \leq 10$   | → K3 | Carico con forti urti                         |
| $K > 10$          | →    | Consultare il Servizio Tecnico di Bonfiglioli |



### 3 TEMPERATURE LIMITE AMMESSE

| Simbolo       | Descrizione / Condizione                                                                                                                                       | Valore (*)     |               |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------|
|               |                                                                                                                                                                | Olio Sintetico | Olio Minerale |
| $t_a$         | Temperatura ambiente                                                                                                                                           |                |               |
| $t_{au \min}$ | Temperatura ambiente minima di utilizzo                                                                                                                        | -30°C          | -10°C         |
| $t_{au \max}$ | Temperatura ambiente massima di utilizzo                                                                                                                       | +50°C          | +40°C         |
| $t_{as \min}$ | Temperatura ambiente minima di stoccaggio                                                                                                                      | -40°C          | -10°C         |
| $t_{as \max}$ | Temperatura ambiente massima di stoccaggio                                                                                                                     | +50°C          | +50°C         |
| $t_s$         | Temperatura superficiale                                                                                                                                       |                |               |
| $t_{s \min}$  | Temperatura minima superficiale del riduttore per avviamento con carico parziale (#)                                                                           | -25°C          | -10°C         |
| $t_{sc \min}$ | Temperatura minima superficiale del riduttore per avviamento a pieno carico                                                                                    | -10°C          | -5°C          |
| $t_{s \max}$  | Temperatura massima superficiale della cassa per utilizzo in modalità di funzionamento continuo a regime (rilevata in prossimità della zona veloce in entrata) | +100°C         | +100°C (@)    |
| $t_o$         | Temperatura dell'olio                                                                                                                                          |                |               |
| $t_{o \max}$  | Temperatura massima dell'olio per utilizzo in modalità di funzionamento continuo a regime                                                                      | +95°C          | +95°C (@)     |

(\*) = Per i valori minimi e massimi specifici per le diverse viscosità d'olio riferirsi alla tabella "Scelta della viscosità ottimale dell'olio". Per i valori di  $t_a < -20^\circ\text{C}$  e  $t_s, t_o > 80^\circ\text{C}$ , scegliere (per quanto consentito in fase di configurazione prodotto) la tipologia di tenuta nel materiale più idoneo al tipo di applicazione. Se necessario contattare il Servizio Tecnico Bonfiglioli.

(@) = Per i valori di  $t_s, t_o > 80^\circ\text{C}$  e  $< 95^\circ\text{C}$ , è sconsigliato l'utilizzo per funzionamenti in continuo.

(#) = Per l'avviamento a pieno carico è consigliabile l'uso di una rampa graduale e prevedere un maggior assorbimento del motore. Se necessario contattare il Servizio Tecnico Bonfiglioli.



## 4 SELEZIONE

### 4.1 Selezione di un motoriduttore

a) Determinare il fattore di servizio  $f_s$  come precedentemente Descritto.

b) Ricavare la potenza richiesta all'albero veloce del riduttore.

$$P_{r1} = \frac{M_{r2} \times n_2}{9550 \times \eta_d} \quad [\text{kW}] \quad (5)$$

c) Nel capitolo: «Dati tecnici motoriduttori» individuare la tabella relativa ad una potenza motore normalizzata  $P_n$  tale che:

$$P_n \geq P_{r1} \quad (6)$$

Se non diversamente indicato, la potenza  $P_n$  dei motori riportata a catalogo si riferisce al servizio continuo S1. Per i motori utilizzati in condizioni diverse da S1, sarà necessario identificare il tipo di servizio previsto con riferimento alle Norme CEI 2-3/IEC 34-1. In particolare, per i servizi da S2 a S8 e per le grandezze motore uguali o inferiori a 132, è possibile ottenere una maggiorazione della potenza rispetto a quella prevista per il servizio continuo, pertanto la condizione da soddisfare sarà:

$$P_n \geq \frac{P_{r1}}{f_m} \quad (7)$$

Il fattore di maggiorazione  $f_m$  è ricavabile dalla tabella che segue.

#### Rapporto di intermittenza

$$I = \frac{t_f}{t_f + t_r} \times 100 \quad (8)$$

$t_f$  = tempo di funzionamento a carico costante

$t_r$  = tempo di riposo

|       | SERVIZIO                  |      |      |                                  |      |     |
|-------|---------------------------|------|------|----------------------------------|------|-----|
|       | S2                        |      |      | S3*                              |      |     |
|       | Durata del ciclo<br>[min] |      |      | Rapporto di intermittenza<br>(I) |      |     |
|       | 10                        | 30   | 60   | 25%                              | 40%  | 70% |
| $f_m$ | 1.35                      | 1.15 | 1.05 | 1.25                             | 1.15 | 1.1 |

\* La durata del ciclo dovrà comunque essere uguale o inferiore a 10 minuti; se superiore interpellare il Servizio Tecnico di Bonfiglioli Riduttori.



Nella sezione relativa alla potenza installata  $P_n$  selezionare infine il motoriduttore che sviluppa la velocità di funzionamento più prossima alla velocità  $n_2$  desiderata e per il quale il fattore di sicurezza  $S$  sia uguale, o superiore, al fattore di servizio  $f_s$ .

$$S \geq f_s \quad (9)$$

Il fattore di sicurezza è così definito:

$$S = \frac{M_{n2}}{M_2} = \frac{P_{n1}}{P_1} \quad (10)$$

Nelle tabelle di selezione motoriduttori gli abbinamenti sono sviluppati con motori a 2, 4 e 6 poli alimentati a 50 Hz.

Per velocità di comando diverse da queste, effettuare la selezione con riferimento ai dati nominali forniti per i riduttori.

## 4.2 Selezione di un riduttore

a) Determinare il fattore di servizio  $f_s$ .

b) Determinare la coppia di calcolo  $M_{c2}$  dalla relazione:

$$M_{c2} = M_{r2} \times f_s \quad (11)$$

c) Ricavare il rapporto di trasmissione:

$$i = \frac{n_1}{n_2} \quad (12)$$

d) Nel capitolo: «Dati tecnici riduttori» individuare la grandezza di riduttore il quale, per la velocità di comando  $n_1$  e per il rapporto  $[i]$  più prossimo a quello calcolato, offra una coppia nominale che soddisfi la seguente condizione:

$$M_{n2} \geq M_{c2} \quad (13)$$

Verificare l'applicabilità del motore selezionato al paragrafo: «Predisposizioni motore».



## 5 VERIFICHE

Effettuata la selezione del riduttore, o motoriduttore, è opportuno procedere alle seguenti Verifiche:

### a) Coppia massima

Generalmente la coppia massima (intesa come punta di carico istantaneo) applicabile al riduttore non deve superare il 150% della coppia nominale  $M_{n2}$ ; sono ammessi valori di picco fino al 300% previa valutazione ed approvazione del Servizio Tecnico Bonfiglioli.

Per i motori trifase a doppia polarità è necessario rivolgere particolare attenzione alla coppia di commutazione istantanea che viene generata durante la commutazione dall'alta velocità alla bassa in quanto può essere decisamente più elevata della coppia massima stessa.

Un metodo semplice ed economico per ridurre tale coppia è quello di alimentare solo due fasi del motore durante la commutazione (il tempo di alimentazione a due fasi può essere regolato mediante un relè a tempo):

| Coppia di commutazione   |                                           |
|--------------------------|-------------------------------------------|
| $Mg_2 = 0.5 \times Mg_3$ |                                           |
| $Mg_2$                   | Coppia di commutazione alimentando 2 fasi |
| $Mg_3$                   | Coppia di commutazione alimentando 3 fasi |

### b) Carichi radiali

Verificare che i carichi radiali Agenti sugli alberi di entrata e/o uscita rientrino nei valori di catalogo ammessi. Se superiori, aumentare la grandezza del riduttore oppure modificare la supportazione del carico.

Ricordiamo che tutti i valori indicati nel catalogo si riferiscono a carichi agenti sulla mezzeria della sporgenza dell'albero in esame per cui, in fase di verifica, è indispensabile tenere conto di questa condizione provvedendo, se necessario, a determinare con le apposite formule il carico ammissibile alla distanza  $x$  a cui si applica la risultante del carico radiale.

### c) Carichi assiali

Anche gli eventuali carichi assiali dovranno essere confrontati con i valori ammissibili.

Se si è in presenza di carichi assiali molto elevati o combinati con carichi radiali, si consiglia di interpellare il ns. Servizio Tecnico.

### d) Avviamenti orari

Per servizi diversi da S1, con un numero rilevante di inserzioni/ora si dovrà tener conto di un fattore  $Z$  (determinabile con le indicazioni riportate nel capitolo dei motori) il quale definisce il numero max. di avviamenti specifico per l'applicazione in oggetto.

## 6 INSTALLAZIONE

### 6.1 Specifiche di carattere Generale

a) Assicurarsi che il fissaggio del riduttore sia stabile onde evitare qualsiasi vibrazione.

Se si prevedono urti, sovraccarichi prolungati o possibili bloccaggi installare giunti idraulici, frizioni, limitatori di coppia, ecc.



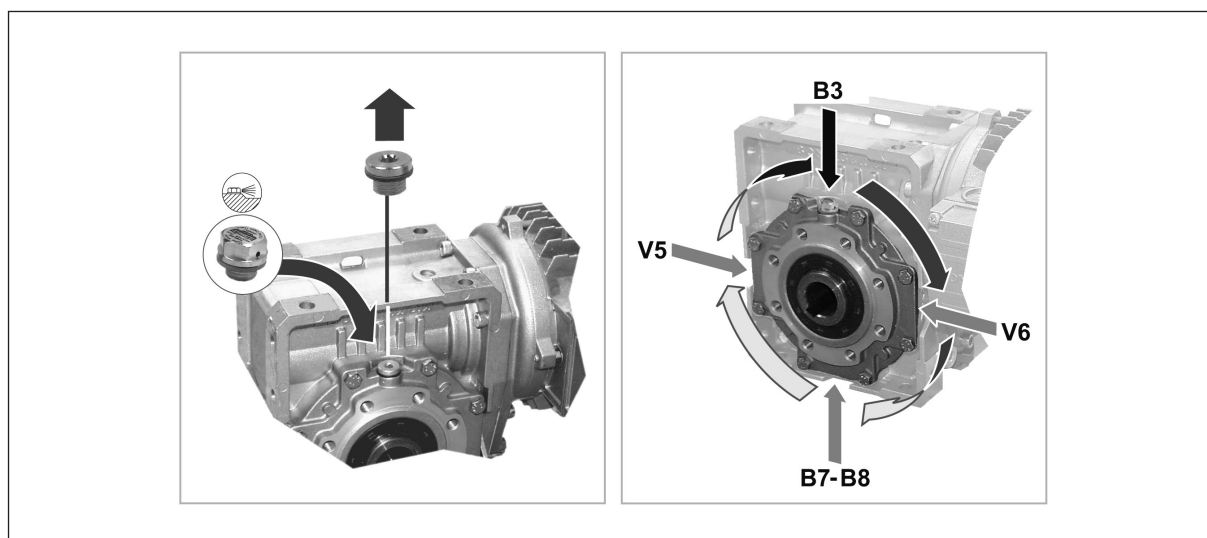
- b) Prima della eventuale verniciatura proteggere le superfici lavorate e il bordo degli anelli di tenuta per evitare che il solvente venga a contatto con la gomma, pregiudicando l'integrità del paraolio stesso.
- c) Gli organi che vanno calettati sugli alberi di uscita del riduttore devono essere lavorati con tolleranza ISO H7 per evitare accoppiamenti troppo bloccati che, in fase di montaggio potrebbero danneggiare irreparabilmente il riduttore stesso. Inoltre, per il montaggio e lo smontaggio di tali organi si consiglia l'uso di adeguati tiranti ed estrattori utilizzando il foro filettato posto in testa alle estremità degli alberi.
- d) Le superfici di contatto dovranno essere pulite e trattate con adeguati protettivi prima del montaggio, onde evitare l'ossidazione e il conseguente bloccaggio delle parti.
- e) Prima della messa in servizio del riduttore accertarsi che la macchina che lo incorpora sia in regola con le disposizioni della Direttiva Macchine 2006/42/CE, e successivi aggiornamenti.
- f) Prima della messa in funzione della macchina, accertarsi che la posizione del livello del lubrificante sia conforme alla posizione di montaggio del riduttore e che la viscosità sia adeguata.
- g) Nel caso di installazione all'aperto prevedere adeguate protezioni e/o carterature allo scopo di evitare l'esposizione diretta agli agenti atmosferici e alla radiazione solare.

## 6.2 Messa in servizio riduttori serie W

I gruppi W 63, W 75 e W 86 sono forniti di un coperchio laterale orientabile, dotato di un tappo cieco per esigenze di trasporto.

Prima della messa in servizio dell'apparecchiatura questo deve essere sostituito con il tappo di sfiato che è fornito a corredo.

Vedi figura:



**Nell'orientamento B6 invece il tappo chiuso NON dovrà essere sostituito con il tappo di sfiato.**



## 7 LUBRIFICAZIONE

I riduttori forniti con lubrificazione permanente non necessitano di sostituzioni periodiche dell'olio. Per gli altri si consiglia di consultare il Manuale d'Uso e Manutenzione disponibile al sito [www.bonfiglioli.com](http://www.bonfiglioli.com) per le indicazioni sui controlli periodici del livello dell'olio e sulla sua sostituzione. Evitare di miscelare oli a base minerale con oli sintetici e/o marche differenti. È buona norma comunque controllare il livello una volta al mese per funzionamento intermittente, o più frequentemente, per funzionamento in continuo, e aggiungere olio se necessario.

### 7.1 Scelta della viscosità ottimale dell'olio (dati riferiti ad oli Shell)

| Lubrificazione per sbattimento |                       | Temperatura ambiente di lavoro [C°] |     |     |     |                                        |     |     |    |   |    |     |     |     |     |     |     |     |     |     |
|--------------------------------|-----------------------|-------------------------------------|-----|-----|-----|----------------------------------------|-----|-----|----|---|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                                |                       | -40                                 | -35 | -30 | -25 | -20                                    | -15 | -10 | -5 | 0 | +5 | +10 | +15 | +20 | +25 | +30 | +35 | +40 | +45 | +50 |
|                                |                       | controllo idoneità tenute           |     |     |     | con tenute standard fornite a catalogo |     |     |    |   |    |     |     |     |     |     |     |     |     |     |
| Olio sintetico (PAG)           | 150 VG                |                                     |     | *   | *   |                                        |     |     |    |   |    |     |     |     |     |     |     |     |     |     |
|                                | 220 VG                |                                     |     |     | *   | *                                      |     |     |    |   |    |     |     |     |     |     |     |     |     |     |
|                                | 320 VG <sup>[1]</sup> |                                     |     |     |     | *                                      |     |     |    |   |    |     |     |     |     |     |     |     |     |     |
|                                | 460 VG <sup>[2]</sup> |                                     |     |     |     |                                        | *   |     |    |   |    |     |     |     |     |     |     |     |     |     |

☐ Limiti di impiego consigliati.

☐ Limiti di impiego consentiti. ☎

☐ Limiti di impiego non consentiti.

\* = Si suggerisce un avviamento graduale e prevedere un maggior assorbimento del motore.

Se necessario e/o nel caso di carichi impulsivi, contattare il Servizio Tecnico Bonfiglioli ☎

[1] Per i riduttori tipo VF - VFR - VF\_EP - W - WR - W\_EP si suggerisce la viscosità 320. Per differenti esigenze contattare il servizio tecnico Bonfiglioli.

[2] Per i riduttori VFL - WL è obbligatorio l'uso della viscosità 460.

### 7.2 Lubrificazione riduttori W e VF

I gruppi VF 27 ... VF 49, W 63 ... W 86 sono normalmente consegnati con carica di lubrificante del tipo "long life" dalla fabbrica, o dalla rete di vendita ufficiale. Su richiesta gli stessi riduttori possono essere forniti privi di lubrificante, specificando per questi l'opzione **SO**. L'applicabilità dell'opzione è descritta nel capitolo "OPZIONI RIDUTTORE". I gruppi VF 130 ... VF 250 e W 110 sono normalmente forniti privi di lubrificante e sarà cura dell'utilizzatore riempirli di olio prima della messa in servizio. Per questi stessi gruppi è disponibile l'opzione **LUBRIFICAZIONE** che, qualora specificata in fase di ordinativo, garantisce il primo riempimento in fabbrica con differenti tipi di lubrificante sintetico (PAG o ad uso alimentare), in quantità dipendente dalla posizione di montaggio. L'applicabilità dell'opzione è descritta nel capitolo "OPZIONI RIDUTTORE". I riduttori combinati serie VF/VF, VF/W e W/VF sono costituiti da due unità distinte lubrificate autonomamente. Per le tavole di riferimento della collocazione dei tappi di servizio e delle quantità di lubrificante, riferirsi al Manuale Uso e Manutenzione (disponibile su [www.bonfiglioli.com](http://www.bonfiglioli.com)). Il lubrificante "long life" fornito di serie è di natura sintetica (OMALA S4 WE 320) e, a meno di contaminazione dall'esterno, non richiede sostituzioni periodiche per tutto l'arco di vita del riduttore.



## 8 STOCCAGGIO

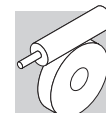
Il corretto stoccaggio dei prodotti richiede l'esecuzione delle seguenti attività:

- a) Escludere aree all'aperto, zone esposte alle intemperie o con eccessiva umidità.
- b) Interporre sempre tra il pavimento ed i prodotti, pianali lignei o di altra natura, atti ad impedire il diretto contatto col suolo.
- c) Per periodi di stoccaggio e soste prolungate le superfici interessate agli accoppiamenti quali flange, alberi e giunti devono essere protette con idoneo prodotto antiossidante (Mobilarma 248 o equivalente). In questo caso i riduttori dovranno essere posizionati con il tappo di sfiato nella posizione più alta e riempiti interamente d'olio. Prima della loro messa in servizio nei riduttori dovrà essere ripristinata la corretta quantità, e il tipo di lubrificante.

## 9 CONDIZIONI DI FORNITURA

I riduttori vengono forniti come segue:

- a) predisposti per essere installati nella posizione di montaggio come specificato in fase di ordine;
- b) collaudati secondo specifiche Interne;
- c) superfici di accoppiamento non verniciate;
- d) esecuzioni predisposte per l'attacco motore complete di viti e dadi per il fissaggio del motore stesso;
- e) alberi protetti da guaine o cappellotti in plastica per le esigenze del trasporto;
- f) provvisti di golfare di sollevamento (dove previsto).



## RIDUTTORI A VITE SENZA FINE

### 10 CARATTERISTICHE COSTRUTTIVE

#### 10.1 Caratteristiche salienti comuni a tutti i riduttori a vite Bonfiglioli

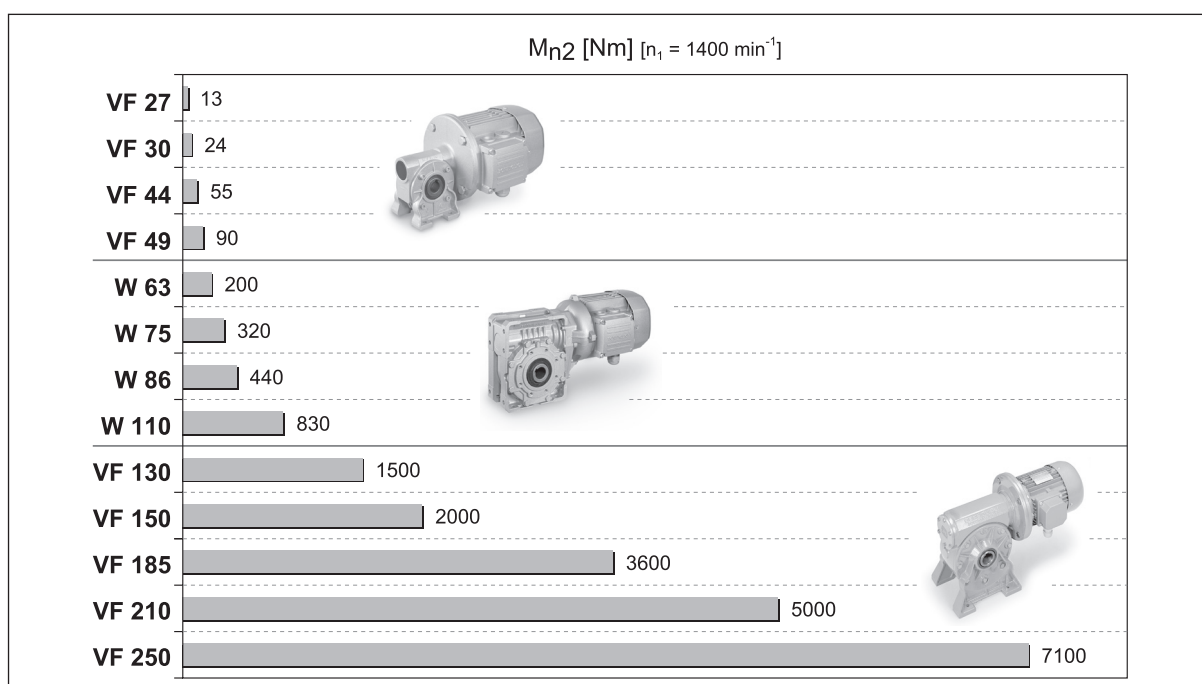
- Albero lento cavo simmetrico per fissaggio bilaterale del riduttore e degli alberi lenti riportati (disponibili come accessorio).
- Ingranaggi a vite senza fine rettificati e lavorazioni meccaniche di precisione consentono elevati rendimenti e grande silenziosità nel funzionamento.
- Numerose opzioni per il fissaggio del riduttore sfruttando le configurazioni con piedi, con flangia, o pendolare (con braccio di reazione opzionale).
- Estesa possibilità di personalizzazione ricorrendo alla lista delle opzioni disponibili.

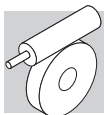
#### 10.2 Caratteristiche specifiche dei gruppi tipo VF

- Casse in Alluminio pressofuso per VF27, VF30, VF44 e VF49. Cassa in ghisa per gruppi da VF130 a VF250. Questi ultimi sono verniciati con polveri epossidiche termoindurenti.

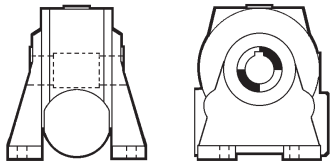
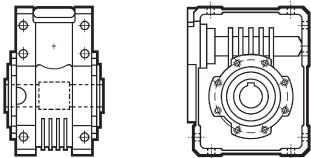
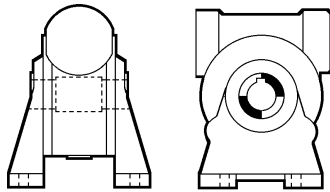
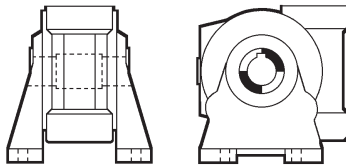
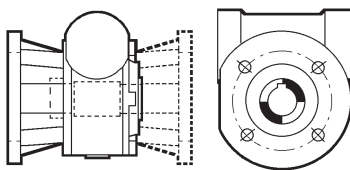
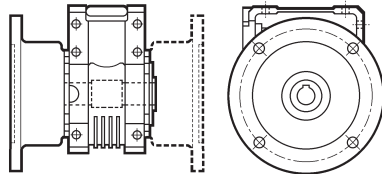
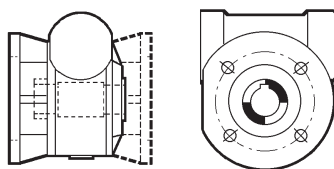
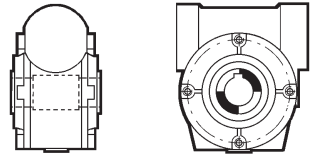
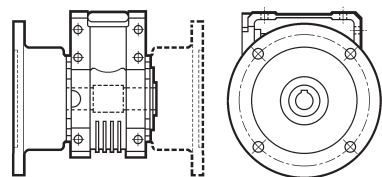
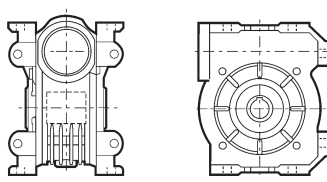
#### 10.3 Caratteristiche specifiche dei gruppi tipo W

- Cassa monoblocco in Alluminio, rigida e precisa.
- Grande versatilità e flessibilità nell'applicazione, data dalla forma cubica e dalle numerose superfici lavorate e disponibili per il fissaggio del riduttore, o di organi accessori.
- Configurazione motoriduttore integrale particolarmente compatta, leggera ed economica.
- Anello di tenuta su albero veloce dei gruppi W63, W75 e W86 collocato in posizione interna e con miscela in fluoro-elastomero per migliorate condizioni di funzionamento e durata.

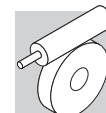




## 11 FORME COSTRUTTIVE

| VF_                                                                                                                                                                                                                                                                              | W_                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p><b>N</b> VF 27 ... VF 250<br/>Piedi e vite orizzontale in basso</p>                                                                                                                         |  <p><b>U</b> W 63 ... W 110<br/>Cassa montaggio universale</p>                                                                                                                                           |
|  <p><b>A</b> VF 27 ... VF 250<br/>Piedi e vite orizzontale in alto</p>                                                                                                                          |                                                                                                                                                                                                                                                                                             |
|  <p><b>V</b> VF 27 ... VF 250<br/>Piedi e vite verticale</p>                                                                                                                                    |                                                                                                                                                                                                                                                                                             |
|  <p><b>F</b> VF 27 ... VF 185<br/>Flangia standard</p> <p><b>F1</b> <b>F2</b><br/><b>FA1</b> <b>FA2</b></p> <p><b>FA</b> VF 44 ... VF 49<br/>Flangia alta</p>                                  |  <p><b>UF 1</b> <b>UF 2</b></p> <p><b>UF</b> W 63 ... W 110<br/>Flangia di montaggio standard</p>                                                                                                        |
|  <p><b>FC</b> VF 130 ... VF 185<br/>Flangia corta</p> <p><b>FR</b> VF 130 ... VF 185<br/>Flangia corta e cuscinetti rinforzati</p> <p><b>FC 1</b> <b>FC 2</b><br/><b>FR 1</b> <b>FR 2</b></p> |                                                                                                                                                                                                                                                                                             |
|  <p><b>P</b> VF 30 ... VF 250<br/>Flangia pendolare</p> <p><b>P1 = P2</b> VF 30 ... VF 49<br/>VF 210, VF 250</p> <p><b>P1</b> <b>P2</b><br/>(VF 30...VF 250) (VF 130...VF 185)</p>            |  <p><b>UFC 1</b> <b>UFC 2</b><br/><b>UFCR 1</b> <b>UFCR 2</b></p> <p><b>UFC</b> W 63 ... W 110<br/>Flangia di lunghezza ridotta</p> <p><b>UFCR</b> W 75<br/>Flangia ridotta in lunghezza e diametro</p> |
|  <p><b>U</b> VF 30 ... VF 49<br/>Piedi integrati</p>                                                                                                                                          |                                                                                                                                                                                                                                                                                             |

Per i riduttori combinati tipo VF/VF, VF/W e W/VF le forme costruttive si riferiscono al secondo riduttore (lato macchina)

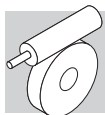


## 12 ESECUZIONE DI MONTAGGIO

Per i riduttori combinati, se non diversamente specificato in fase di ordinativo, verranno configurate le esecuzioni di montaggio evidenziate in grigio nello schema seguente.

|                         | CW1 | CCW1 | CW2 | CCW2 | CW3 | CCW3 | CW4 | CCW4 |
|-------------------------|-----|------|-----|------|-----|------|-----|------|
| U                       |     |      |     |      |     |      |     |      |
| UF_<br>UFC_<br>UFR1_    |     |      |     |      |     |      |     |      |
| N                       |     |      |     |      |     |      |     |      |
| A                       |     |      |     |      |     |      |     |      |
| V                       |     |      |     |      |     |      |     |      |
| F1<br>FA1<br>FC1<br>FR1 |     |      |     |      |     |      |     |      |
| F2<br>FA2<br>FC2<br>FR2 |     |      |     |      |     |      |     |      |
| P1                      |     |      |     |      |     |      |     |      |
| P2                      |     |      |     |      |     |      |     |      |

Coperchio per fissaggio pendolare

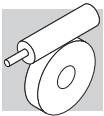


Nella configurazione HS (albero veloce cilindrico) è possibile ottenere tutte le esecuzioni di montaggio raffigurate.

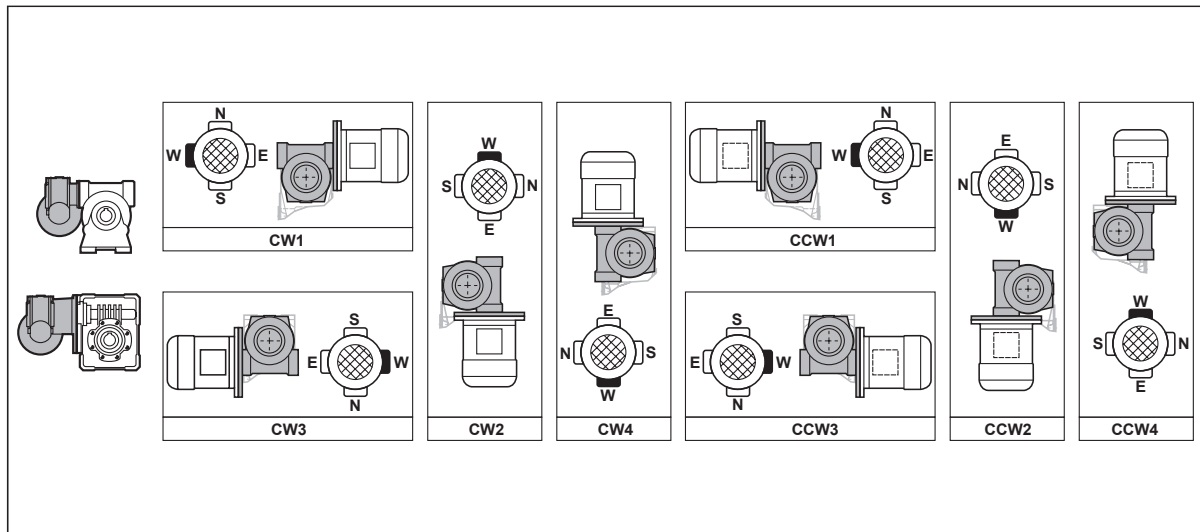
Nella configurazione P (IEC) determinate esecuzioni di montaggio possono essere ottenute solo utilizzando flange IEC (B5 o B14) di grandezza uguale o inferiore a quelle riportate nella tabella seguente.

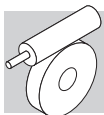
|              |                        | CW1<br>CCW1  | CW2<br>CCW2  | CW3          | CCW3         | CW4<br>CCW4  |  |  |
|--------------|------------------------|--------------|--------------|--------------|--------------|--------------|--|--|
| VF/VF30/44   | A, N, V, P1<br>F-FA,U  | 63B14        | 63B14        | 63B14        | 63B14        | 63B14        |  |  |
| VF/VF30/49   | A, N, V, P1,<br>F-FA,U | 63B14        | 63B14        | 63B14        | 63B14        | 63B14        |  |  |
| VF/W30/63    | U,<br>UF-UFC           | 63B5-63B14   | 63B5-63B14   | 63B5-63B14   | 63B5-63B14   | 63B5-63B14   |  |  |
| VF/W44/75    | U,<br>UF-UFC-UFCR      | 71B5-71B14   | 71B5-71B14   | 71B5-71B14   | 71B5-71B14   | 71B5-71B14   |  |  |
| VF/W44/86    | U,<br>UF-UFC           | 71B5-71B14   | 71B5-71B14   | 71B5-71B14   | 71B5-71B14   | 71B5-71B14   |  |  |
| VF/W49/110   | U,<br>UF-UFC           | 80B5-80B14   | 80B5-80B14   | 80B5-80B14   | 80B5-80B14   | 80B5-80B14   |  |  |
| W/VF63/130   | N                      | 71B5-90B14   | 90B5-90B14   | 71B5-90B14   | 71B5-90B14   | 71B5-90B14   |  |  |
|              | A                      | 90B5-90B14   | 71B5-90B14   | 90B5-90B14   | 90B5-90B14   | 90B5-90B14   |  |  |
|              | V                      |              | 90B5-90B14   |              |              | —            |  |  |
|              | F1                     | 90B5-90B14   | 71B5-90B14   | 90B5-90B14   | 71B5-90B14   | 90B5-90B14   |  |  |
|              | FC1-FR1                |              |              |              | 90B5-90B14   |              |  |  |
|              | P1                     |              |              |              | 90B5-90B14   |              |  |  |
|              | F2                     | 90B5-90B14   | 71B5-90B14   | 71B5-90B14   | 90B5-90B14   | 90B5-90B14   |  |  |
|              | FC2-FR2                |              |              |              |              |              |  |  |
| P2           |                        | 90B5-90B14   |              |              |              |              |  |  |
| W/VF86/150   | N                      | 112B5-112B14 | 112B5-112B14 | 71B5-112B14  | 71B5-112B14  | 71B5-112B14  |  |  |
|              | A                      | 112B5-112B14 | 90B5-112B14  | 112B5-112B14 | 112B5-112B14 | 112B5-112B14 |  |  |
|              | V                      | 112B5-90B14  | 112B5-90B14  |              |              | 71B5-112B14  |  |  |
|              | F1                     | 112B5-112B14 | 71B5-90B14   | 112B5-112B14 | 71B5-90B14   | 112B5-112B14 |  |  |
|              | FC1-FR1                |              | 90B5-112B14  |              | 112B5-112B14 |              |  |  |
|              | P1                     |              |              |              |              |              |  |  |
|              | F2                     | 112B5-112B14 | 71B5-90B14   | 71B5-90B14   | 112B5-112B14 | 112B5-112B14 |  |  |
|              | FC2-FR2                |              | 90B5-112B14  |              |              |              |  |  |
| P2           |                        | 90B5-112B14  | 112B5-112B14 |              |              |              |  |  |
| W/VF86/185   | N                      | 112B5-112B14 | 112B5-112B14 | 90B5-112B14  | 90B5-112B14  | 90B5-112B14  |  |  |
|              | A                      | 90B5-112B14  |              | 112B5-112B14 | 112B5-112B14 | 112B5-112B14 |  |  |
|              | V                      | 112B5-90B14  | 90B5-112B14  |              |              | 90B5-112B14  |  |  |
|              | F1                     | 112B5-112B14 | 90B5-112B14  | 112B5-112B14 | 90B5-112B14  | 112B5-112B14 |  |  |
|              | FC1-FR1                |              |              |              | 112B5-112B14 |              |  |  |
|              | P1                     |              |              |              |              |              |  |  |
|              | F2                     | 112B5-112B14 | 90B5-112B14  | 90B5-112B14  | 112B5-112B14 | 112B5-112B14 |  |  |
|              | FC2-FR2                |              |              |              |              |              |  |  |
| P2           |                        | 112B5-112B14 |              |              |              |              |  |  |
| VF/VF130/210 | N                      | #            | 132B5        | #            | #            | #            |  |  |
|              | A                      |              | #            | 132B5        | 132B5        | 132B5        |  |  |
|              | V                      |              |              |              |              |              |  |  |
|              | P                      |              |              |              |              |              |  |  |
| VF/VF130/250 | N                      | #            | 132B5        | #            | #            | #            |  |  |
|              | A                      |              | 132B5        | #            | 132B5        | 132B5        |  |  |
|              | V                      |              |              | 132B5        |              |              |  |  |
|              | P                      |              |              | #            |              |              |  |  |

# Consultare il ns. servizio Tecnico Commerciale



## 12.1 Orientamento morsetti





## 13 DESIGNAZIONE

### RIDUTTORE

**W 63 L1 UF1 — 24 S2 — B3** .....

#### OPZIONI

#### ESECUZ. DI MONTAGGIO

|                   |                                                   |
|-------------------|---------------------------------------------------|
| VF/VF, VF/W, W/VF | <b>CW (1, 2, 3, 4)</b><br><b>CCW (1, 2, 3, 4)</b> |
|-------------------|---------------------------------------------------|

#### POSIZIONE DI MONTAGGIO

|                                               |                                         |
|-----------------------------------------------|-----------------------------------------|
| VF 27...VF 49<br>VFR 44, VFR 49               | <b>B3</b>                               |
| W, WR<br>VF 130...VF 250<br>VFR 130...VFR 250 | <b>B3 (default), B6, B7, B8, V5, V6</b> |
| VF/VF<br>VF/W<br>W/VF                         | <b>B3 (default), B6, B7, B8, V5, V6</b> |

#### INTERFACCIA MOTORE IEC

|            |                                           |
|------------|-------------------------------------------|
| <b>B5</b>  | (VF 30...VF 250, VFR 49...VFR 250, W, WR) |
| <b>B14</b> | (VF 30...VF 49, W)                        |

#### DESIGNAZIONE INGRESSO

|               | VF                                  | VFR                    | W              | WR             | VF/VF                       | VF/W          | W/VF           |
|---------------|-------------------------------------|------------------------|----------------|----------------|-----------------------------|---------------|----------------|
| <b>P(IEC)</b> | <br>P27 (VF 27 only),<br>P56...P225 | <br>P63,<br>P80...P160 | <br>P71...P132 | <br>P63...P112 | <br>P56, P63,<br>P90...P132 | <br>P56...P80 | <br>P71...P112 |
| <b>S_</b>     | <br>-                               | <br>S44 (VFR 44 only)  | <br>S1...S3    | <br>-          | <br>-                       | <br>-         | <br>S1...S3    |
| <b>HS</b>     |                                     |                        |                |                |                             |               |                |

#### RAPPORTO DI RIDUZIONE

#### DIAMETRO ALBERO LENTO

|                    |                                          |
|--------------------|------------------------------------------|
| W 75<br>VF/W 44/75 | <b>D30 (default), D28 (Su richiesta)</b> |
|--------------------|------------------------------------------|

#### FORMA COSTRUTTIVA

#### LIMITATORE DI COPPIA

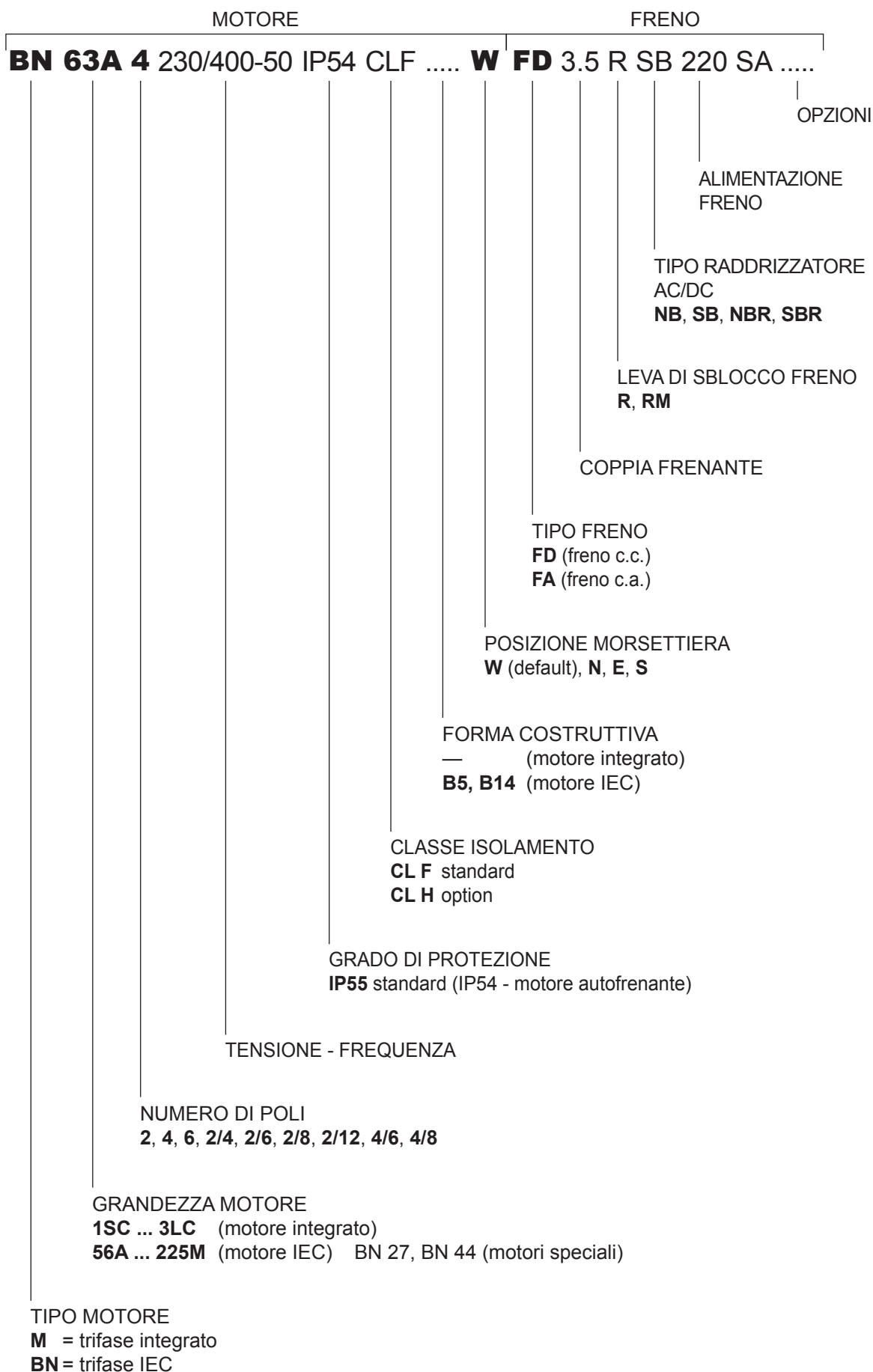
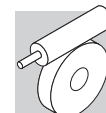
|                  |               |       |           |
|------------------|---------------|-------|-----------|
| VF, VFR<br>W, WR | <b>L1, L2</b> | VF/VF | <b>LF</b> |
|------------------|---------------|-------|-----------|

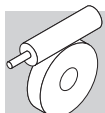
#### GRANDEZZA RIDUTTORE

|       |                                                |       |                                       |
|-------|------------------------------------------------|-------|---------------------------------------|
| VF    | <b>27, 30, 44, 49, 130, 150, 185, 210, 250</b> | VF/VF | <b>30/44, 30/49, 130/210, 130/250</b> |
| VFR   | <b>44, 49, 130, 150, 185, 210, 250</b>         | VF/W  | <b>30/63, 44/75, 44/86, 49/110</b>    |
| W, WR | <b>63, 75, 86, 110</b>                         | W/VF  | <b>63/130, 86/150, 86/185</b>         |

#### TIPO RIDUTTORE

|                          |                                    |
|--------------------------|------------------------------------|
| <b>VF, W</b>             | Riduttore a vite senza fine        |
| <b>VFR, WR</b>           | Riduttore con precoppia elicoidale |
| <b>VF/VF, VF/W, W/VF</b> | Riduttore combinato                |





## 14 OPZIONI RIDUTTORE

### LUBRIFICAZIONE

I riduttori VF 27, VF 30, VF 44, VF 49 e W 63, W 75, W 86 in configurazione standard, sono forniti provvisti di carica di lubrificante. I riduttori VF 130, VF 150, VF 185, VF 210, VF 250 e W 110, in configurazione standard, sono forniti privi di lubrificante.

È possibile comunque, per tutte le taglie di riduttori provviste di carica di lubrificante, richiedere fornitura con ulteriori tipologie di olio, selezionabile in accordo a quanto definito nella tabella (LUB. 01)

L'applicabilità dell'opzione LUBRIFICAZIONE è descritta nella tabella (LUB. 02).

| LUBRIFICAZIONE | Tipo              | Designazione          | Produttore                                                                          |
|----------------|-------------------|-----------------------|-------------------------------------------------------------------------------------|
| LH             | Poliglicole (PAG) | OMALA S4 WE 150       |  |
| LS             | Poliglicole (PAG) | OMALA S4 WE 220       |                                                                                     |
| LO* [1]        | Poliglicole (PAG) | OMALA S4 WE 320       |                                                                                     |
| LK* [2]        | Poliglicole (PAG) | OMALA S4 WE 460       |                                                                                     |
| LA             | Uso alimentare    | KLUBERSYNTH UH1 6-150 |  |
| LB             | Uso alimentare    | KLUBERSYNTH UH1 6-220 |                                                                                     |
| LC [1]         | Uso alimentare    | KLUBERSYNTH UH1 6-320 |                                                                                     |
| LD [1]         | Uso alimentare    | KLUBERSYNTH UH1 6-460 |                                                                                     |

\* Se non diversamente specificato, i riduttori VF 27, VF 30, VF 44 e VF 49 forniti con carica di lubrificante "a vita" utilizzano olio OMALA S WE 320.

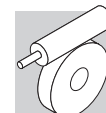
[1] Impiego suggerito per i riduttori tipo VF, VFR, VF\_EP, W, WR, W\_EP.

[2] Impiego obbligatorio per i riduttori tipo VFL, WL.

|                   | LUBRIFICAZIONE         |    |    |    |    |    |
|-------------------|------------------------|----|----|----|----|----|
|                   | Posizione di montaggio |    |    |    |    |    |
|                   | B3                     | B6 | B7 | B8 | V5 | V6 |
| W 110 U-UF-UFC    | X                      | X  | X  | X  | ⊖  | ⊖  |
| VF 130 A-N-P-F-FC | X                      | X  | X  | X  | ⊖  | ⊖  |
| VF 130 V          | ⊖                      | X  | X  | ⊖  | X  | X  |
| VF 130 FR         | X                      | ⊖  | ⊖  | X  | ⊖  | ⊖  |
| VF 150 A-N-P-F-FC | X                      | X  | X  | X  | ⊖  | ⊖  |
| VF 150 V          | ⊖                      | X  | X  | ⊖  | X  | X  |
| VF 150 FR         | X                      | ⊖  | ⊖  | X  | ⊖  | ⊖  |
| VF 185 A-N-P-F-FC | X                      | X  | X  | X  | ⊖  | ⊖  |
| VF 185 V          | ⊖                      | X  | X  | ⊖  | X  | X  |
| VF 185 FR         | X                      | ⊖  | ⊖  | X  | ⊖  | ⊖  |
| VF 210 A-N-P      | X                      | ⊖  | ⊖  | X  | ⊖  | ⊖  |
| VF 210 V          | ⊖                      | ⊖  | ⊖  | ⊖  | X  | X  |
| VF 250 A-N-P      | X                      | ⊖  | ⊖  | X  | ⊖  | ⊖  |
| VF 250 V          | ⊖                      | ⊖  | ⊖  | ⊖  | X  | X  |

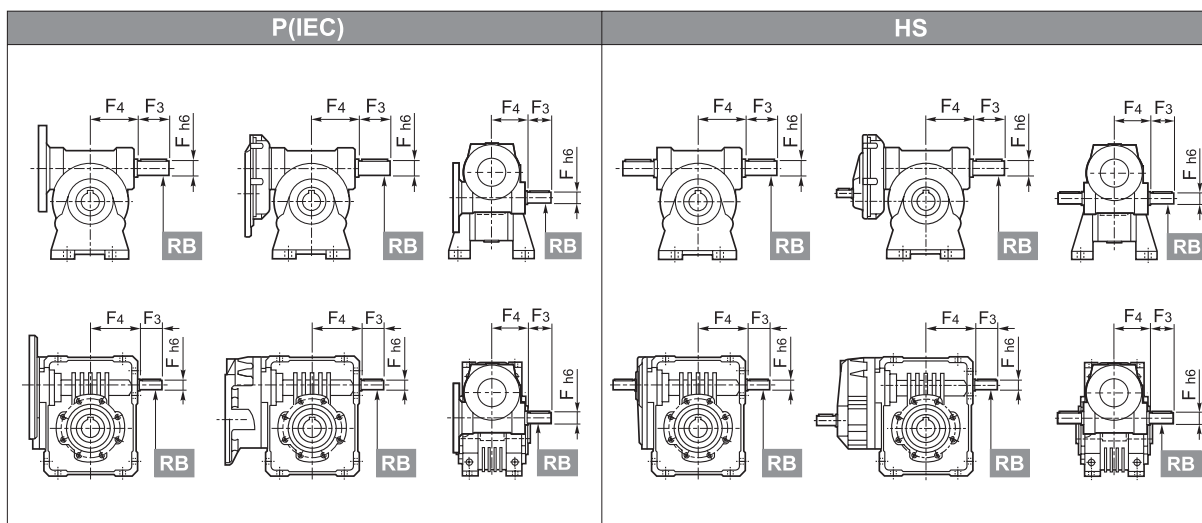
### SO

I riduttori tipo VF 27 ... VF 49, W 63 ... W 86, solitamente riempiti in fabbrica di lubrificante, sono in questo caso forniti privi di olio.



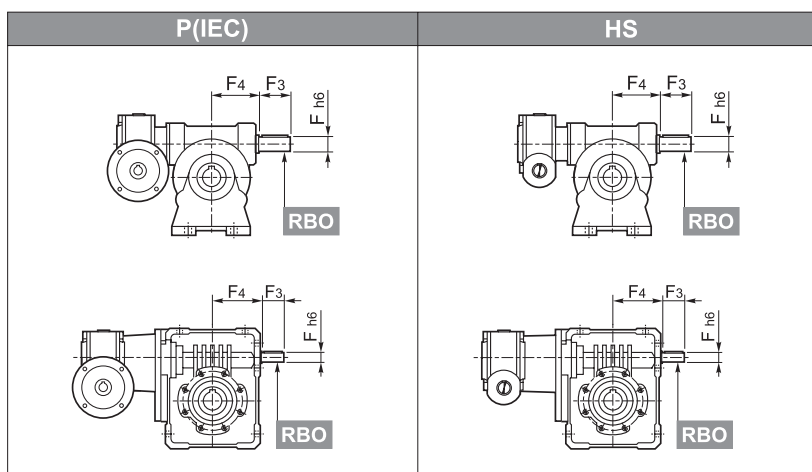
## RB

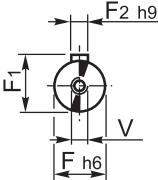
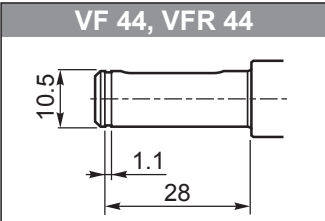
Albero veloce sporgente sul lato opposto comando (escluso VF 27).



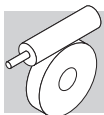
## RBO

Albero veloce sporgente sul 2° riduttore (solo per esecuzioni combinate).



| Dimensioni albero sporgente (opzioni RB e RBO)                                      |       |     |     |      |    |    |       |        |
|-------------------------------------------------------------------------------------|-------|-----|-----|------|----|----|-------|--------|
|  |       | F   | F1  | F2   | F3 | F4 | V     |        |
|  | VF    | 30  | 9   | 10.2 | 3  | 20 | 50    | —      |
|                                                                                     | VFR   | 44  | 11  | 12.5 | 4  | 30 | 56    | —      |
|                                                                                     | VF/VF | 49  | 16  | 18   | 5  | 40 | 65    | M6     |
|                                                                                     | W     | 63  | 18  | 20.5 | 6  | 40 | 74    | M6     |
|                                                                                     | WR    | 75  | 19  | 21.5 | 6  | 40 | 88.5  | M6     |
|                                                                                     | VF/W  | 86  | 25  | 28   | 8  | 50 | 101.5 | M8     |
|                                                                                     |       | 110 | 25  | 28   | 8  | 60 | 127.5 | M8     |
|                                                                                     |       | VF  | 130 | 30   | 33 | 8  | 60    | 160    |
| VFR                                                                                 |       | 150 | 35  | 38   | 10 | 65 | 185   | M8     |
| W/VF                                                                                |       | 185 | 40  | 43   | 12 | 70 | 214.5 | M8     |
|                                                                                     |       | 210 | 48  | 51.5 | 14 | 82 | 185   | M16x40 |
|                                                                                     |       | 250 | 55  | 59   | 16 | 82 | 228   | M16x40 |

Per VF 210 e VF 250, nelle forme costruttive **A** e **P**, normalmente viene montata la ventola di raffreddamento; con l'opzione **RB** non è possibile applicarla.



## VV

Anello di tenuta in fluoro-elastomero sull'albero veloce. Disponibile per W110 e per gruppi serie VF, ad esclusione di VF 30 con opzione RB e VF 30\_HS.

## PV

Fornitura di anelli di tenuta in fluoro-elastomero sia sull'albero lento sia sull'albero veloce, ad esclusione di VF 30 con opzione RB, e VF 30\_HS.

## KA

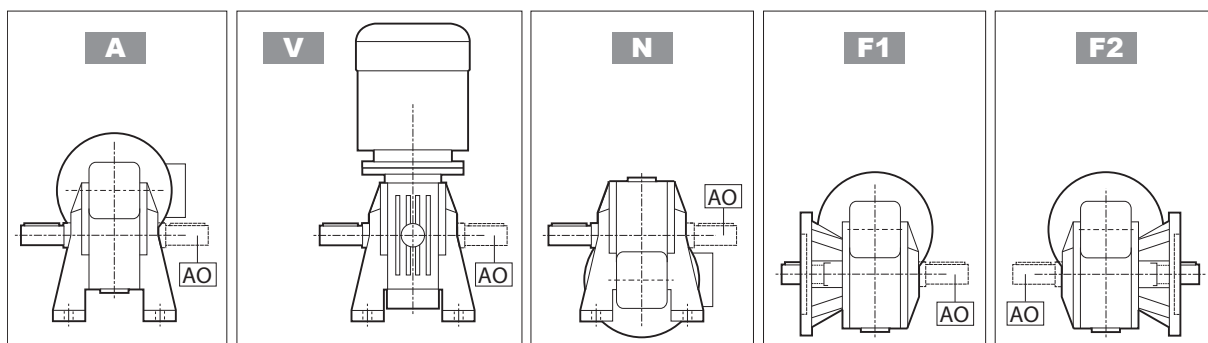
Kit piedi W 63...W 110 per intercambiabilità con gruppi equivalenti VF\_A.

## KV

Kit piedi W 63...W 110 per intercambiabilità con gruppi equivalenti VF\_V (esclusi W con opzione RB e W 110 in posizione di montaggio B6).

## AO

Albero su lato opposto a standard (VF 27).



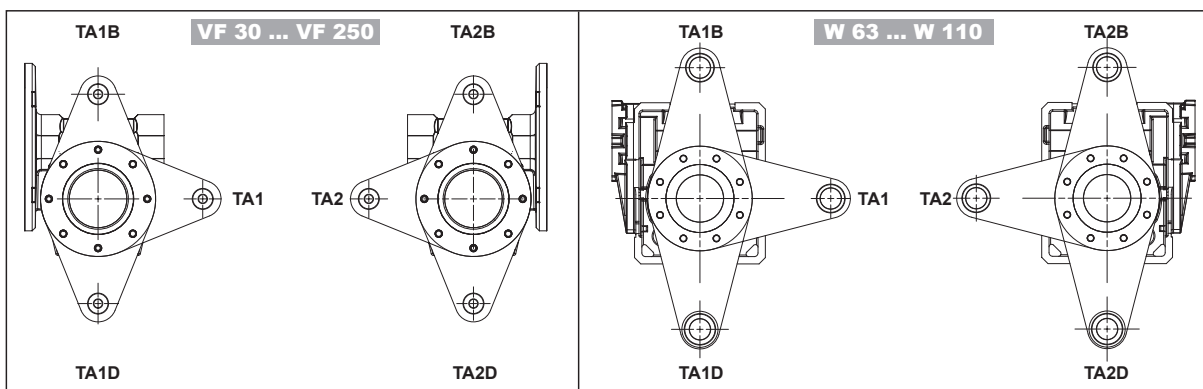
## BP

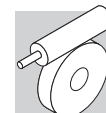
I riduttori, solitamente forniti con tappo di sfiato aperto, sono forniti con tappo di sfiato a valvola. La taratura della valvola in funzione delle tipologie può variare da 0,10 a 0,15 bar. La valvola si apre ad intervalli e permette l'uscita delle pressioni interne senza permettere l'ingresso di corpi estranei. Per la disponibilità dell'opzione vedere il capitolo "Posizioni di montaggio e tappi di servizio" del Manuale d'Uso e Manutenzione (disponibile su [www.bonfiglioli.com](http://www.bonfiglioli.com)).

Se necessario contattare il Servizio Tecnico Bonfiglioli.

## BRACCIO DI REAZIONE

I riduttori VF 30...VF 250 e W 63... W 110 vengono forniti con il braccio di reazione assemblato. È possibile richiedere il braccio di reazione in diverse posizioni di montaggio (TA1, TA2, TA1B, TA2B, TA1D, TA2D) come illustrato.





L'applicabilità dell'opzione BRACCIO DI REAZIONE è descritta nella tabella seguente.

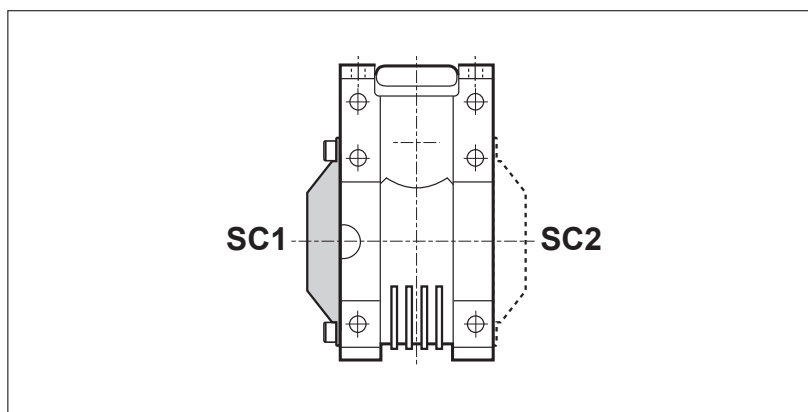
|                            |                           | BRACCIO DI REAZIONE |                   |
|----------------------------|---------------------------|---------------------|-------------------|
|                            |                           | TA1 - TA1B - TA1D   | TA2 - TA2B - TA2D |
| VF<br>VFR<br>VF/VF<br>W/VF | VF 30 ... VF 49 F1        | ⊖                   | X                 |
|                            | VF 30 ... VF 49 F2        | X                   | ⊖                 |
|                            | VF 44 - VF 49 FA1         | ⊖                   | X                 |
|                            | VF 44 - VF 49 FA2         | X                   | ⊖                 |
|                            | VF 30 ... VF 49 P1        | X                   | X                 |
|                            | VF 210 - VF 250 P1        | X                   | X                 |
|                            | VF 130 ... VF 185 P1      | X                   | ⊖                 |
|                            | VF 130 ... VF 185 P2      | ⊖                   | X                 |
| W<br>WR<br>VF/W            | W 63 ... W 110 U          | X                   | X                 |
|                            | W 63 ... W 110 UF1 - UFC1 | ⊖                   | X                 |
|                            | W 63 ... W 110 UF2 - UFC2 | X                   | ⊖                 |
|                            | W 75 UFCR1                | ⊖                   | X                 |
|                            | W 75 UFCR2                | X                   | ⊖                 |

L'opzione non è assemblabile nei riduttori VFL-WL nel lato dove è previsto il limitatore di coppia.  
L'opzione non è compatibile con il CAPPELOTTO DI PROTEZIONE se previsto dallo stesso lato.

### CAPPELOTTO DI PROTEZIONE

I riduttori W-WR 63-75-86-110 vengono forniti con un cappellotto di protezione dell'asse lento (in materiale plastico).

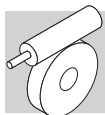
È possibile indicare il lato su cui prevedere la protezione (SC1, SC2) come illustrato.



L'applicabilità dell'opzione CAPPELOTTO DI PROTEZIONE è descritta nella tabella seguente.

|                 |                           | CAPPELOTTO DI PROTEZIONE |     |
|-----------------|---------------------------|--------------------------|-----|
|                 |                           | SC1                      | SC2 |
| W<br>WR<br>VF/W | W 63 ... W 110 U          | X                        | X   |
|                 | W 63 ... W 110 UF1 - UFC1 | ⊖                        | X   |
|                 | W 63 ... W 110 UF2 - UFC2 | X                        | ⊖   |
|                 | W 75 UFCR1                | ⊖                        | X   |
|                 | W 75 UFCR2                | X                        | ⊖   |

L'opzione non è assemblabile nei riduttori VFL-WL nel lato dove è previsto il limitatore di coppia.  
L'opzione non è compatibile con il BRACCIO DI REAZIONE se previsto dallo stesso lato.



## PROTEZIONE SUPERFICIALE

I riduttori, che laddove non viene richiesta una classe di protezione specifica, nelle zone verniciate (ferrose) rispettano come requisito minimo la classe di protezione C2 (UNI EN ISO 12944-2), sono forniti con protezione superficiale **C3** e **C4** per una migliore resistenza alla corrosione atmosferica, ottenute mediante verniciatura del gruppo completo.

| PROTEZIONE SUPERFICIALE | Ambienti tipici                                                                                                           | Temperatura superficiale max. | Classe di corrosività secondo UNI EN ISO 12944-2 |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------|
| <b>C3</b>               | Ambienti urbani ed industriali, con umidità relativa dell'aria max.100% (inquinamento ambientale medio)                   | 120°C                         | C3                                               |
| <b>C4</b>               | Aree industriali, zone costiere, impianti chimici, con umidità relativa dell'aria max.100% (inquinamento ambientale alto) | 120°C                         | C4                                               |

I riduttori previsti con le protezioni opzionali **C3** e **C4** sono disponibili in diverse tinte.

Se non specificata nessuna tinta (vedere opzione "VERNICIATURA") la fornitura viene eseguita con la tinta RAL7042.

A richiesta sono fornibili riduttori per classe di corrosività **C5** secondo UNI EN ISO 12944-2, contattando il ns. Servizio tecnico-Commerciale.

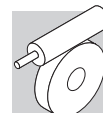
## VERNICIATURA

I riduttori previsti con le protezioni opzionali C3 e C4 sono disponibili in diverse tinte, secondo la tabella seguente.

| VERNICIATURA    | Colore              | Catalogazione RAL |
|-----------------|---------------------|-------------------|
| <b>RAL7042*</b> | Grigio traffico A   | 7042              |
| <b>RAL5010</b>  | Blu genziana        | 5010              |
| <b>RAL9005</b>  | Nero intenso        | 9005              |
| <b>RAL9006</b>  | Alluminio brillante | 9006              |
| <b>RAL9010</b>  | Bianco puro         | 9010              |
| <b>RAL7035</b>  | Grigio chiaro       | 7035              |
| <b>RAL7001</b>  | Grigio argento      | 7001              |
| <b>RAL5015</b>  | Blu cielo           | 5015              |
| <b>RAL7037</b>  | Grigio polvere      | 7037              |
| <b>RAL5024</b>  | Blu pastello        | 5024              |

\* Colore di fornitura standard se non specificato diversamente

NOTA - L'opzione "VERNICIATURA" è configurabile esclusivamente in abbinamento con l'opzione "PROTEZIONE SUPERFICIALE".



---

## PROVE DOCUMENTALI

### **AC - Attestato di conformità**

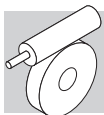
Documento il cui rilascio attesta la conformità del prodotto all'ordinativo e la costruzione dello stesso in conformità alle procedure standard di processo e di controllo previste dal sistema di Qualità Bonfiglioli Riduttori.

### **CC - Certificato di collaudo**

La specifica comporta la conduzione di verifiche di conformità all'ordine, controlli visivi generali e verifiche strumentali delle dimensioni di accoppiamento. Sono inoltre condotti controlli generali di funzionamento a vuoto e verifiche della funzionalità delle guarnizioni di tenuta in modalità statica e in funzionamento. Il collaudo si applica ad un campione statistico del lotto di spedizione.

### **Opzioni motori**

**Per informazioni sulle opzioni, consultare i relativi capitoli nella sezione Motori Elettrici.**



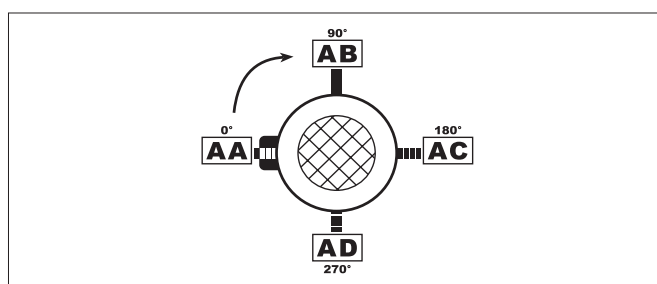
## 15 POSIZIONI DI MONTAGGIO E ORIENTAMENTO MORSETTIERA

Gli orientamenti delle morsettiere dei motori sono identificati osservando il motore dal lato ventola; l'orientamento pre-impostato in fabbrica è evidenziato in nero (W).

**Le posizioni morsettieria illustrate non sono valide per VFR 44. Fare riferimento alla pag. 19 e alle pag. 116-117 per la designazione e l'identificazione della forma costruttiva.**

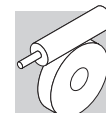
### Posizione angolare leva di sblocco freno.

Nei motori autofrenanti, la leva di sblocco freno (se richiesta) ha l'orientamento standard a 90° rispetto alla morsettieria (posizione AB); specificare con relative opzioni qualora l'orientamento desiderato sia diverso.



Nelle pagine seguenti sono descritte le posizioni di montaggio dei riduttori tipo VF e W.

Per i riduttori combinati tipo VF/VF, VF/W e W/VF le posizioni di montaggio si riferiscono al secondo riduttore (lato macchina), per il primo riduttore (lato ingresso) fare riferimento al capitolo "Esecuzione di montaggio".



VF 27 \_ ... VF 49 \_

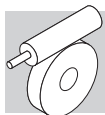
VFR 44 \_ , VFR 49 \_

|   |    |    |    | _HS     | _S - _P (IEC)          |
|---|----|----|----|---------|------------------------|
| A | B3 | B7 | V5 |         | <br>W N E<br>S<br>VF   |
|   | B6 | B8 | V6 |         | <br>W N<br>S E<br>VFR* |
| N | B3 | B7 | V5 |         | <br>W N E<br>S<br>VF   |
|   | B6 | B8 | V6 |         | <br>W N<br>S E<br>VFR* |
| V | B3 | B7 | V5 | <br>VF  | <br>VF                 |
|   | B6 | B8 | V6 | <br>VFR | <br>VFR*               |
| P | B3 | B7 | V5 |         | <br>E N S<br>W<br>VF   |
|   | B6 | B8 | V6 |         | <br>W N<br>S E<br>VFR* |
| F | B3 | B7 | V5 |         | <br>E N S<br>W<br>VF   |
|   | B6 | B8 | V6 |         | <br>W N<br>S E<br>VFR* |
| U | B3 | B7 | V5 |         | <br>W N E<br>S<br>VF   |
|   | B6 | B8 | V6 |         | <br>W N<br>S E<br>VFR* |

Posizione di montaggio base.

I riduttori sono targati esclusivamente nella posizione di montaggio base (B3) ma possono essere installati anche nelle posizioni derivate (B6, B7, B8, V5, V6). Dopo l'installazione la posizione di montaggio non può essere variata.

\* Le posizioni morsetteria illustrate non sono valide per VFR 44. Fare riferimento alla pag. 19 e alle pag. 116-117 per la designazione e l'identificazione della forma costruttiva.



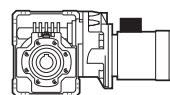
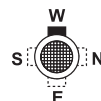
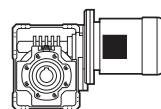
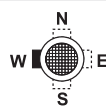
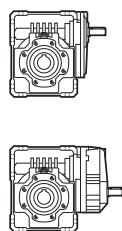
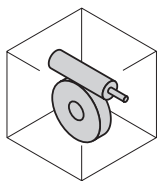
W 63 U ... W 110 U

WR 63 U ... WR 110 U

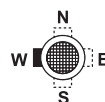
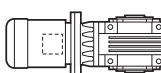
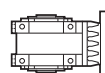
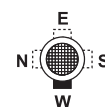
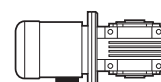
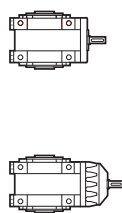
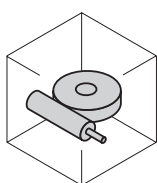
\_HS

\_S - \_P (IEC)

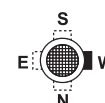
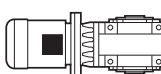
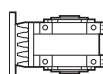
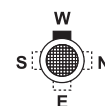
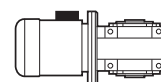
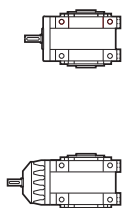
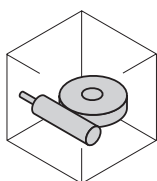
B3



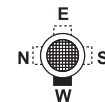
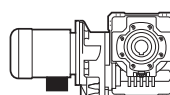
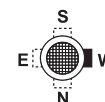
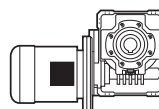
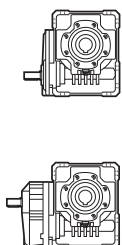
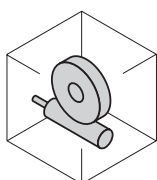
B6



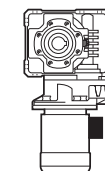
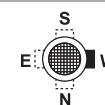
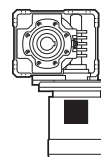
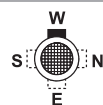
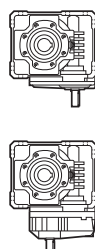
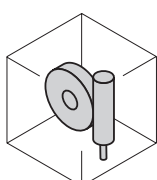
B7



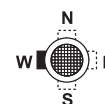
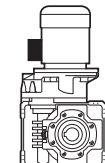
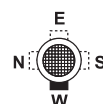
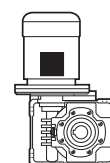
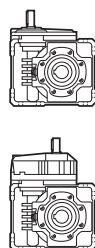
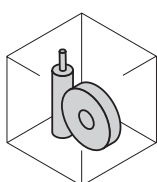
B8

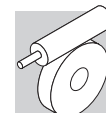


V5



V6



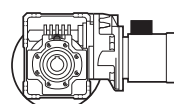
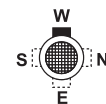
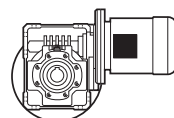
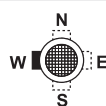
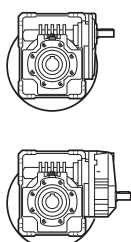
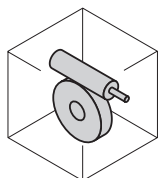


# W 63 UF/UFC ... W 110 UF/UFC    WR 63 UF/UFC ... WR 110 UF/UFC

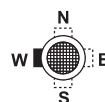
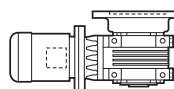
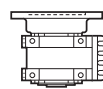
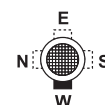
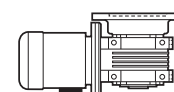
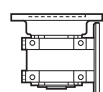
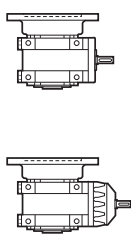
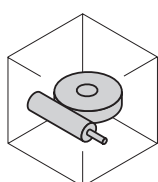
\_HS

\_S - \_P (IEC)

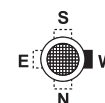
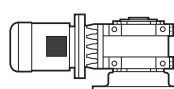
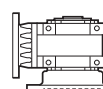
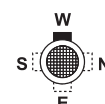
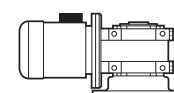
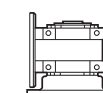
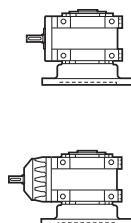
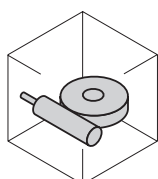
B3



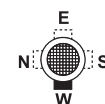
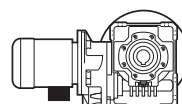
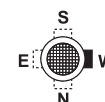
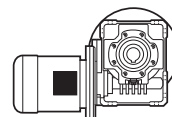
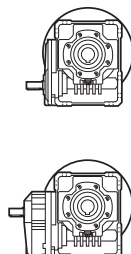
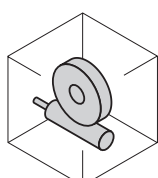
B6



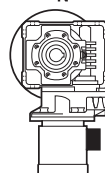
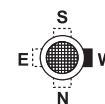
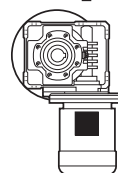
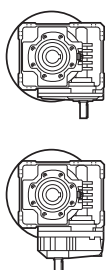
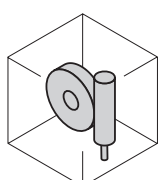
B7



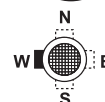
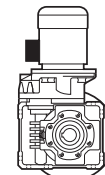
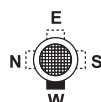
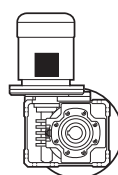
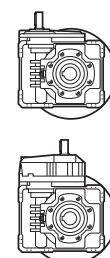
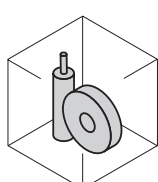
B8

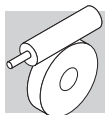


V5



V6





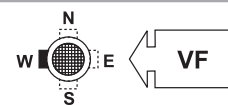
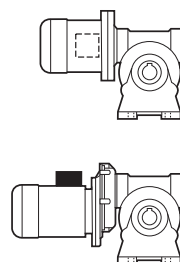
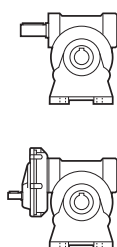
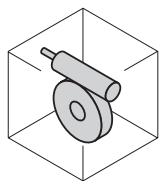
# VF 130 A ... VF 250 A

# VFR 130 A ... VFR 250 A

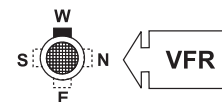
\_HS

\_P (IEC)

B3

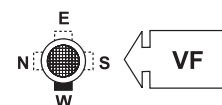
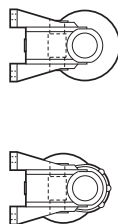
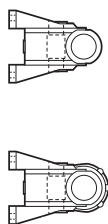
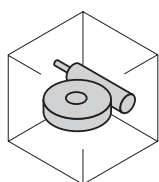


VF

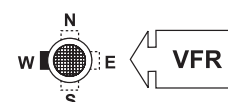


VFR

B6

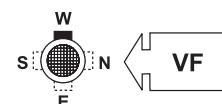
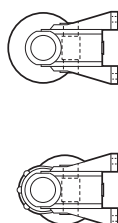
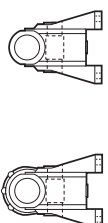
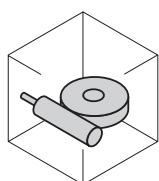


VF

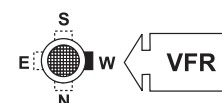


VFR

B7

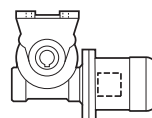
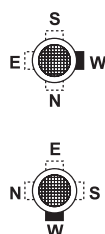
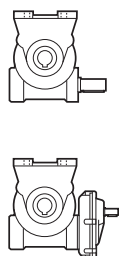
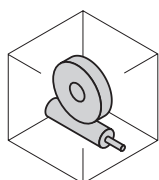


VF

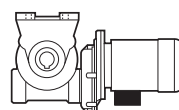


VFR

B8

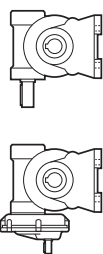
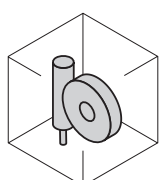


VF



VFR

V5



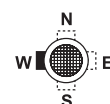
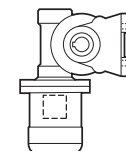
VF



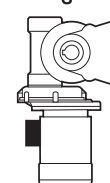
VFR



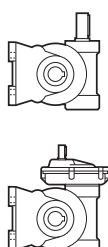
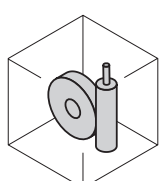
VF



VFR



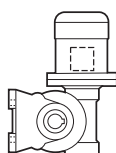
V6



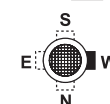
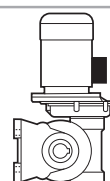
VF



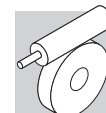
VFR



VF



VFR



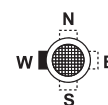
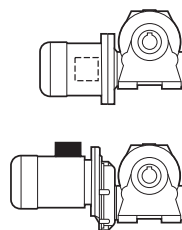
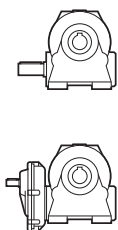
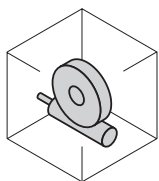
# VF 130 N ... VF 250 N

# VFR 130 N ... VFR 250 N

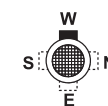
\_HS

\_P (IEC)

B3

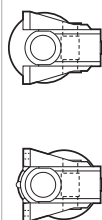
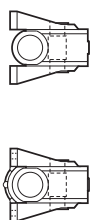
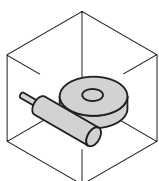


VF

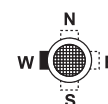
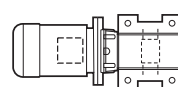


VFR

B6

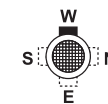
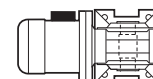
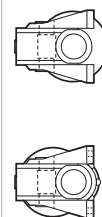
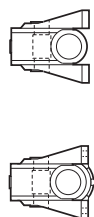
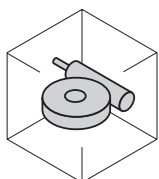


VF

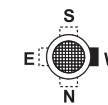
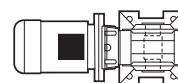


VFR

B7

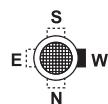
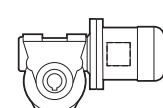
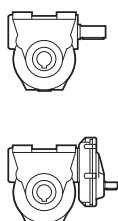
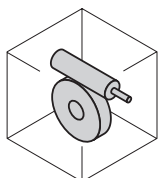


VF

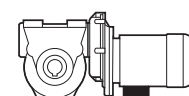


VFR

B8

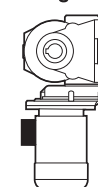
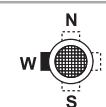
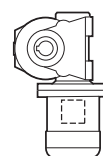
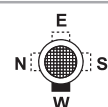
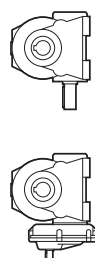
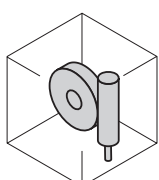


VF



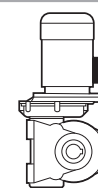
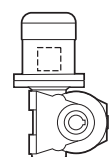
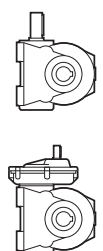
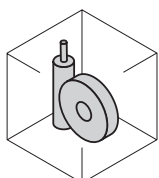
VFR

V5

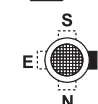
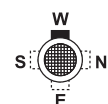


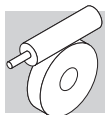
VFR

V6



VFR





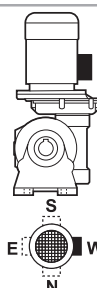
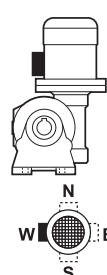
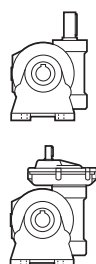
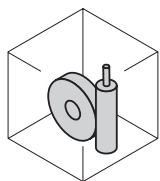
## VF 130 V ... VF 250 V

## VFR 130 V ... VFR 250 V

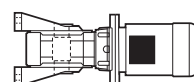
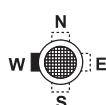
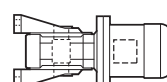
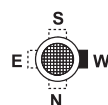
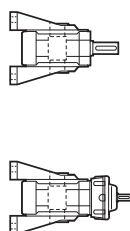
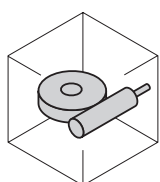
\_HS

\_P (IEC)

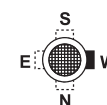
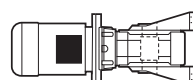
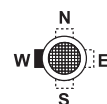
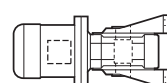
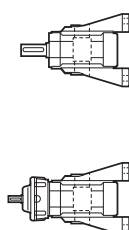
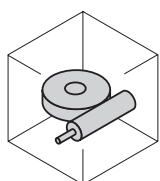
B3



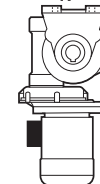
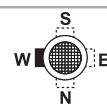
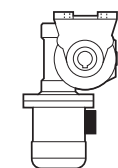
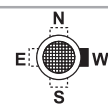
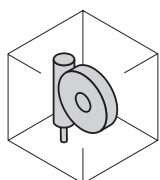
B6



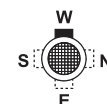
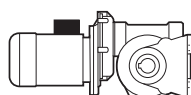
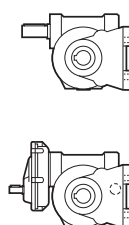
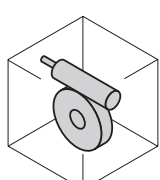
B7



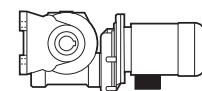
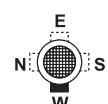
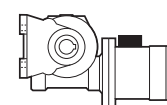
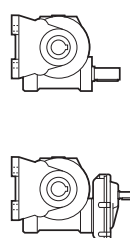
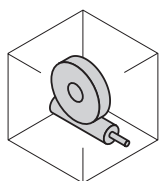
B8

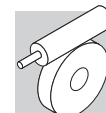


V5



V6





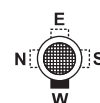
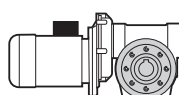
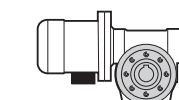
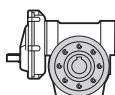
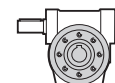
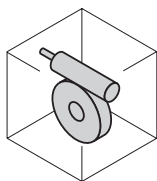
## VF 130 P ... VF 250 P

## VFR 130 P ... VFR 250 P

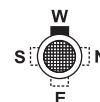
\_HS

\_P (IEC)

B3

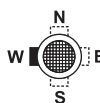
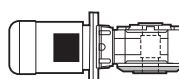
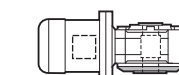
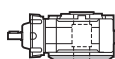
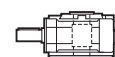
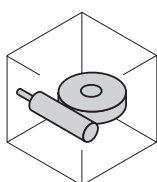


VF

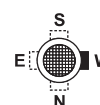


VFR

B6

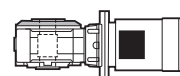
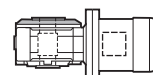
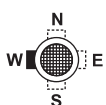
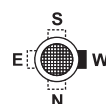
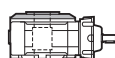
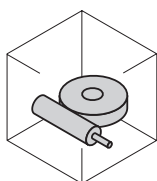


VF



VFR

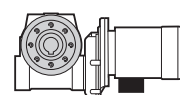
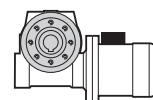
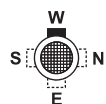
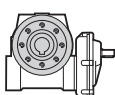
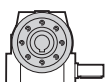
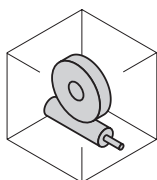
B7



VF

VFR

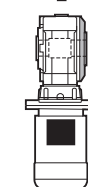
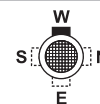
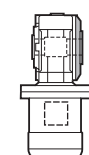
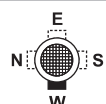
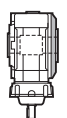
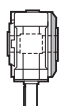
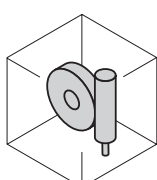
B8



VF

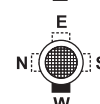
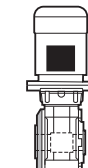
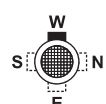
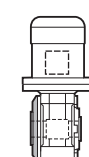
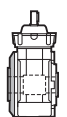
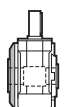
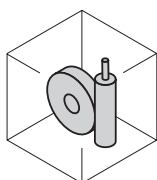
VFR

V5

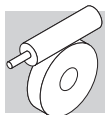


VFR

V6



VFR



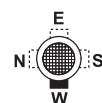
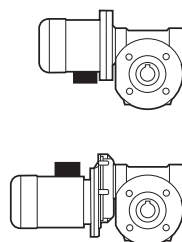
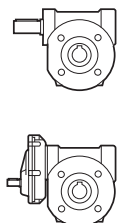
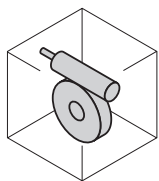
# VF 130 F ... VF 250 F

# VFR 130 F ... VFR 250 F

\_HS

\_P (IEC)

B3

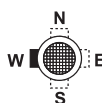
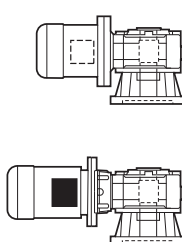
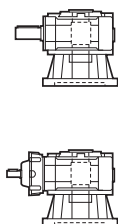
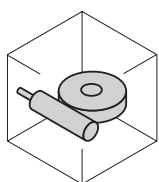


VF

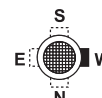


VFR

B6

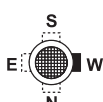
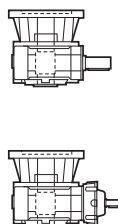
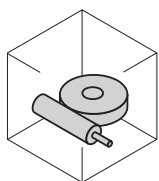


VF



VFR

B7

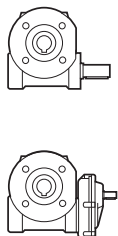
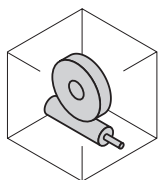


VF



VFR

B8

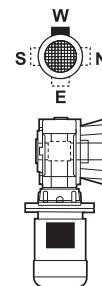
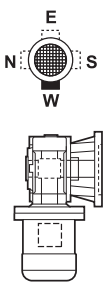
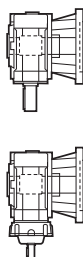
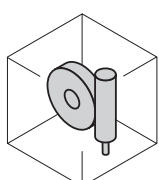


VF

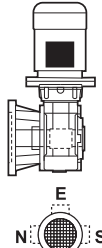
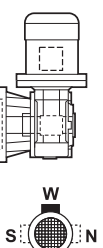
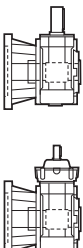
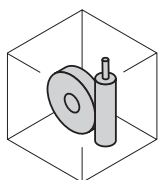


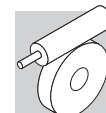
VFR

V5



V6





## 16 CARICHI RADIALI

### 16.1 Forza risultante sull'albero

Organi di trasmissione calettati sugli alberi di ingresso e/o di uscita del riduttore generano forze la cui risultante agisce in senso radiale sull'albero stesso.

L'entità di questi carichi deve essere compatibile con la capacità di sopportazione del sistema albero-cuscinetti del riduttore, in particolare il valore assoluto del carico applicato ( $R_{c1}$  per albero di ingresso,  $R_{c2}$  per albero di uscita) deve essere inferiore al valore nominale ( $R_{n1}$  per albero di ingresso,  $R_{n2}$  per albero di uscita) riportato nelle tabelle dati tecnici.

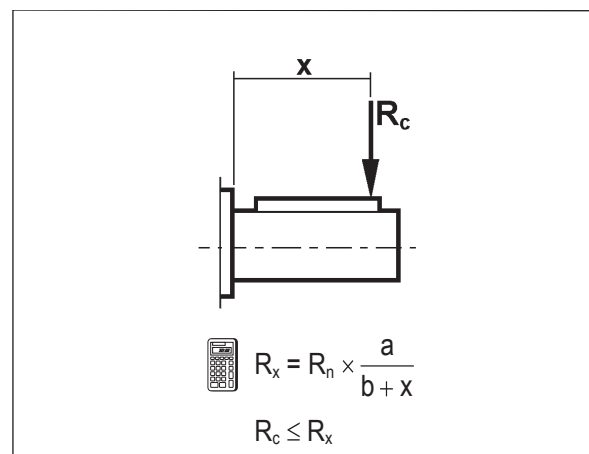
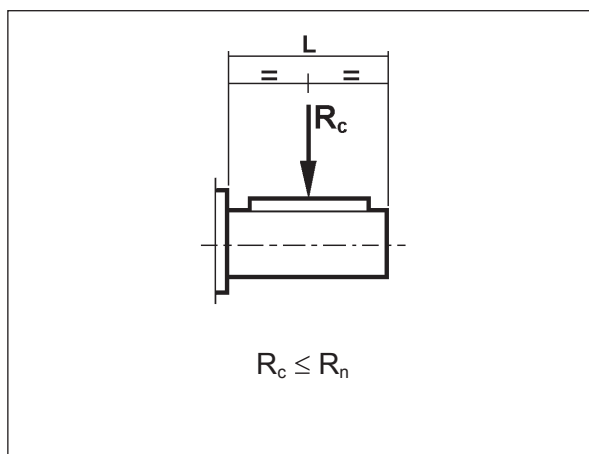
Il procedimento sotto descritto si applica indifferentemente all'albero veloce o all'albero lento avendo l'avvertenza di utilizzare le costanti relative all'albero interessato dal calcolo.

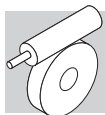
Il carico generato da una trasmissione esterna può essere calcolato, con buona approssimazione, tramite la formula seguente:

$$R_c = \frac{2000 \times M \times K_r}{d}$$

|                   |  |          |  |
|-------------------|--|----------|--|
| $K_r = 1$         |  | $M$ [Nm] |  |
| $K_r = 1.25$      |  | $d$ [mm] |  |
| $K_r = 1.5 - 2.0$ |  |          |  |

### 16.2 Verifica sopportazione radiale





### 16.3 Costanti del riduttore

|                                        | Albero lento |     | $R_{n2} \text{ max}$<br>[N] |
|----------------------------------------|--------------|-----|-----------------------------|
|                                        | a            | b   |                             |
| <b>VF 27</b>                           | 56           | 44  | 600                         |
| <b>VF 30</b>                           | 60           | 45  | 1700                        |
| <b>VF 44 - VFR 44 - VF/VF 30/44</b>    | 71           | 51  | 2500                        |
| <b>VF 49 - VFR 49 - VF/VF 30/49</b>    | 99           | 69  | 3450                        |
| <b>W 63 - WR 63 - VF/W 30/63</b>       | 132          | 102 | 5000                        |
| <b>W 75 - WR 75 - VF/W 44/75</b>       | 139          | 109 | 6200                        |
| <b>W 86 - WR 86 - VF/W 44/86</b>       | 149          | 119 | 7000                        |
| <b>W 110 - WR 110 - VF/W 49/110</b>    | 173          | 136 | 8000                        |
| <b>VF 130 - VFR 130 - W/VF 63/130</b>  | 182          | 142 | 13800                       |
| <b>VF 150 - VFR 150 - W/VF 86/150</b>  | 198          | 155 | 16000                       |
| <b>VF 185 - VFR 185 - W/VF 86/185</b>  | 220          | 170 | 19500                       |
| <b>VF 210 - VFR 210 - W/VF 130/210</b> | 268          | 203 | 34500                       |
| <b>VF 250 - VFR 250 - W/VF 130/250</b> | 334          | 252 | 52000                       |

## 17 CARICHI ASSIALI

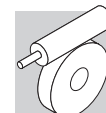
I valori di carico assiale ammissibile sugli alberi veloce  $[A_{n1}]$  e lento  $[A_{n2}]$  si possono ricavare con riferimento al corrispondente valore di carico radiale  $[R_{n1}]$  e  $[R_{n2}]$  tramite le espressioni che seguono:

$$\begin{aligned} A_{n1} &= R_{n1} \times 0,2 \\ A_{n2} &= R_{n2} \times 0,2 \end{aligned} \quad (14)$$

I valori di carico assiale ammissibile così calcolati si riferiscono al caso di forze assiali agenti contemporaneamente ai carichi radiali nominali.

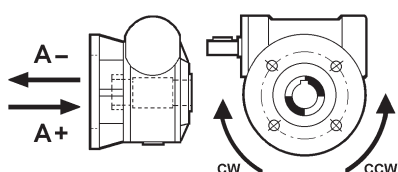
Nel solo caso in cui il valore del carico radiale agente sull'albero del riduttore sia nullo, si può considerare il carico assiale ammissibile  $[A_n]$  pari al 50% del valore di carico radiale ammissibile  $[R_n]$  sullo stesso albero.

In presenza di carichi assiali eccedenti il valore ammissibile, o di forze assiali fortemente prevalenti sui carichi radiali, è consigliabile contattare il Servizio Tecnico di Bonfiglioli Riduttori per una verifica puntuale.



## 17.1 Carichi assiali massimi ammissibili nella forma costruttiva FR

Per soddisfare le applicazioni che richiedono dei carichi assiali molto elevati, è disponibile la forma costruttiva FR prevista nelle grandezze VF 130, VF 150 e VF 185. Questa forma costruttiva, le cui dimensioni esterne sono identiche a quelle della forma FC, può sopportare i carichi assiali (notevolmente superiori a quelli ammessi dalle forme standard) riportati nella tabella seguente riferiti al rapporto di trasmissione  $[i]$  ed al senso di rotazione +/- dell'albero lento.

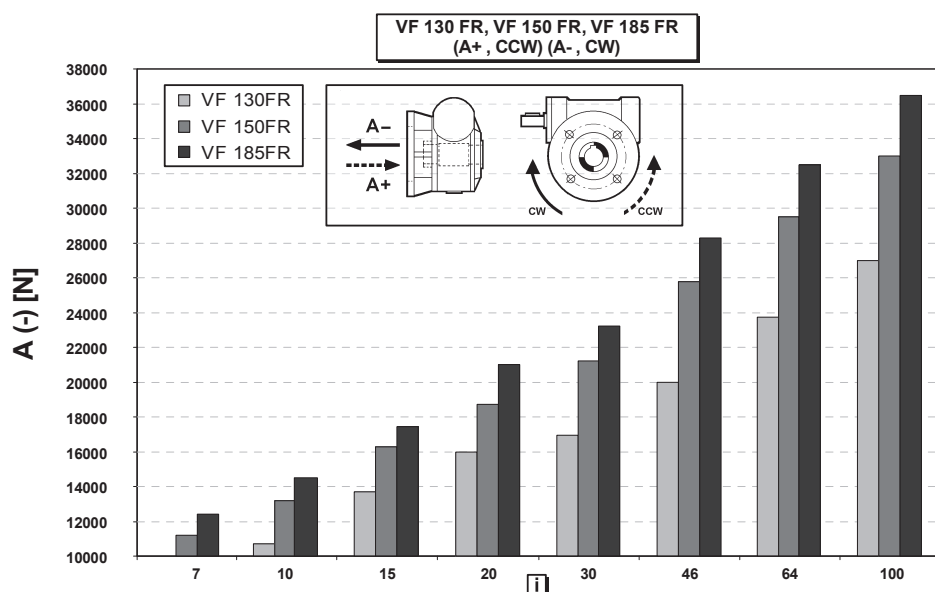
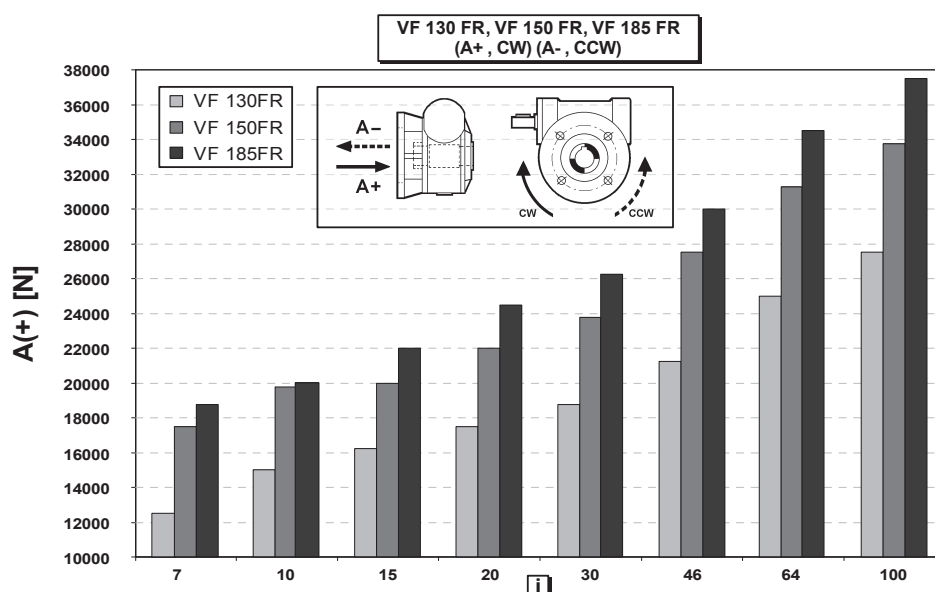


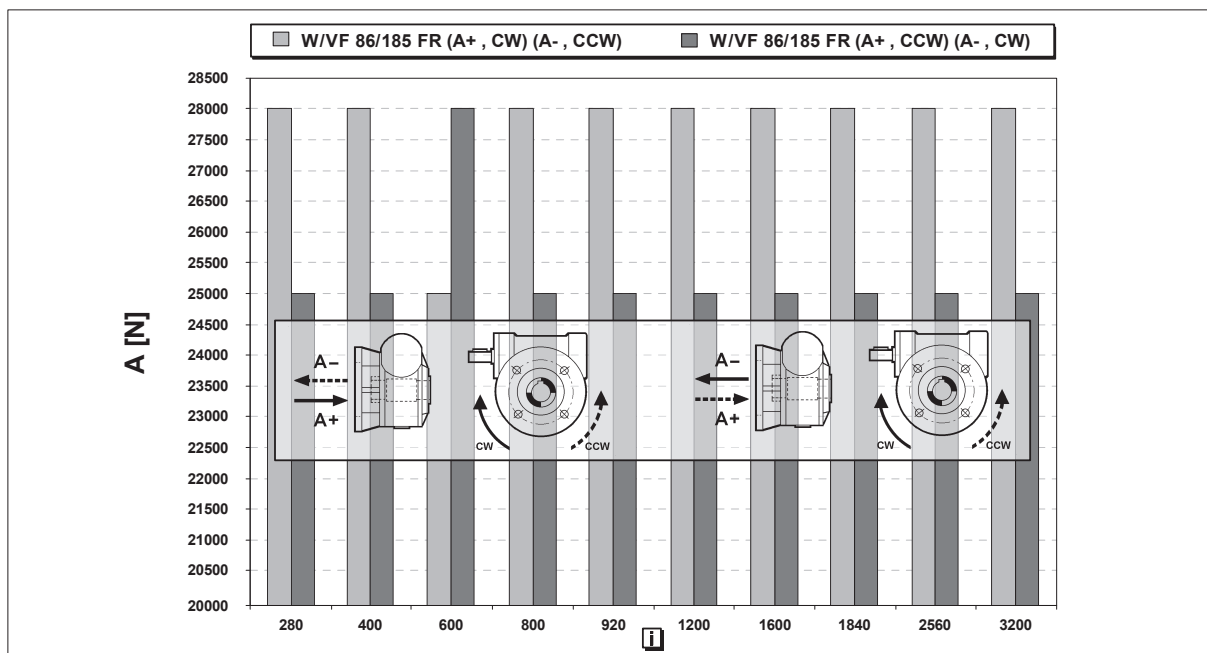
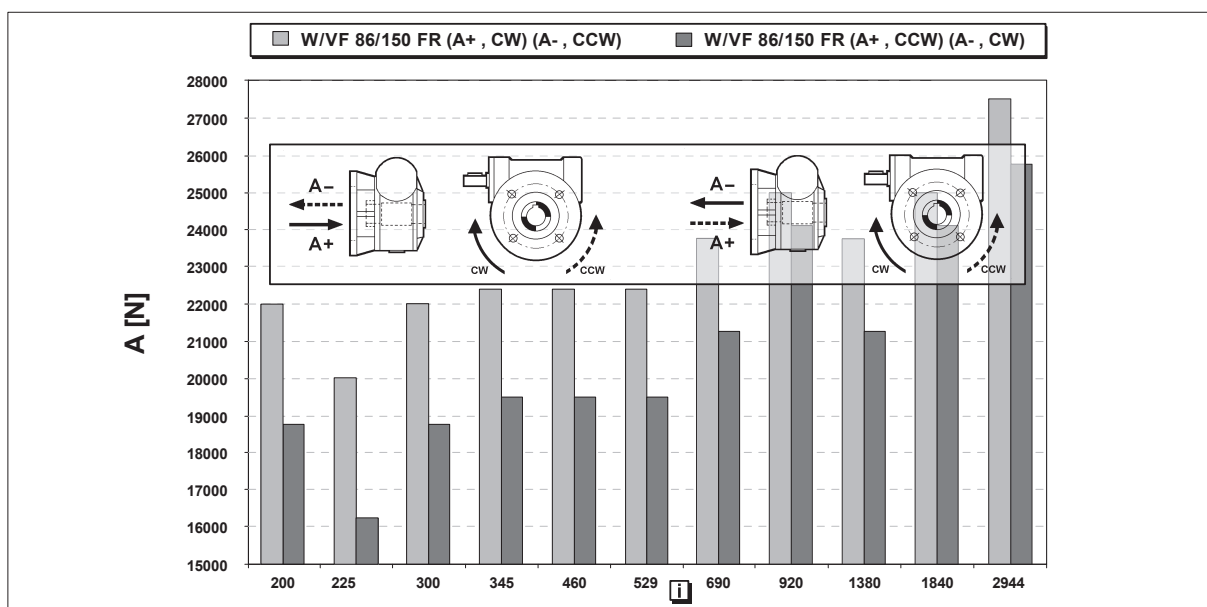
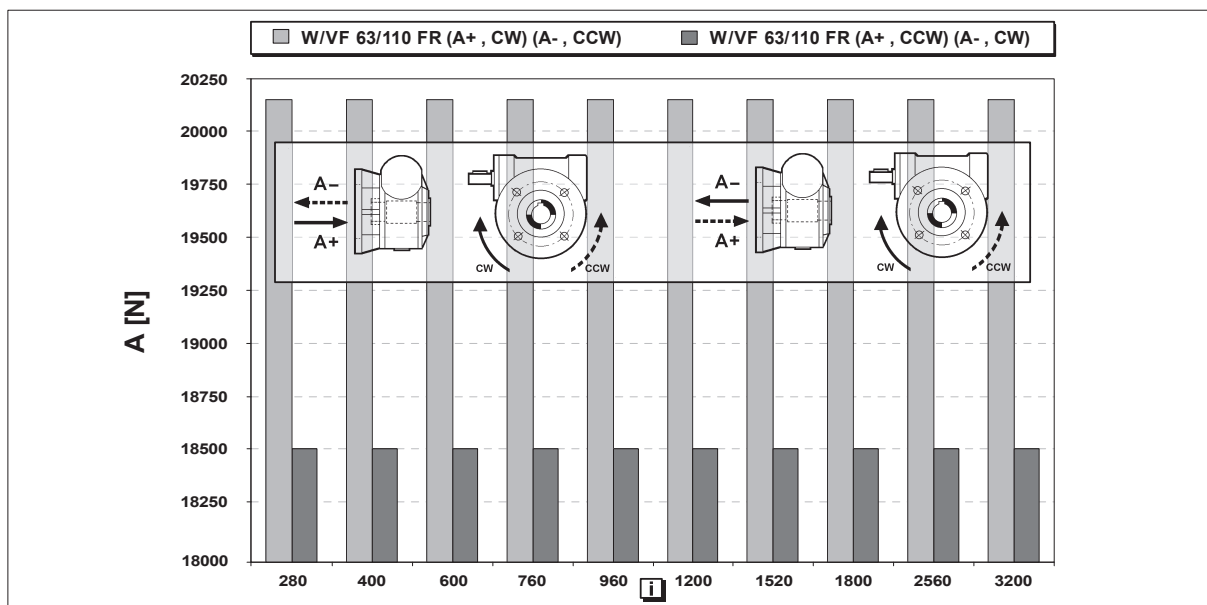
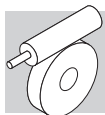
**A+** = Carico assiale in compressione

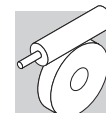
**A-** = Carico assiale in trazione

**CW** = Rotazione oraria

**CCW** = Rotazione antioraria







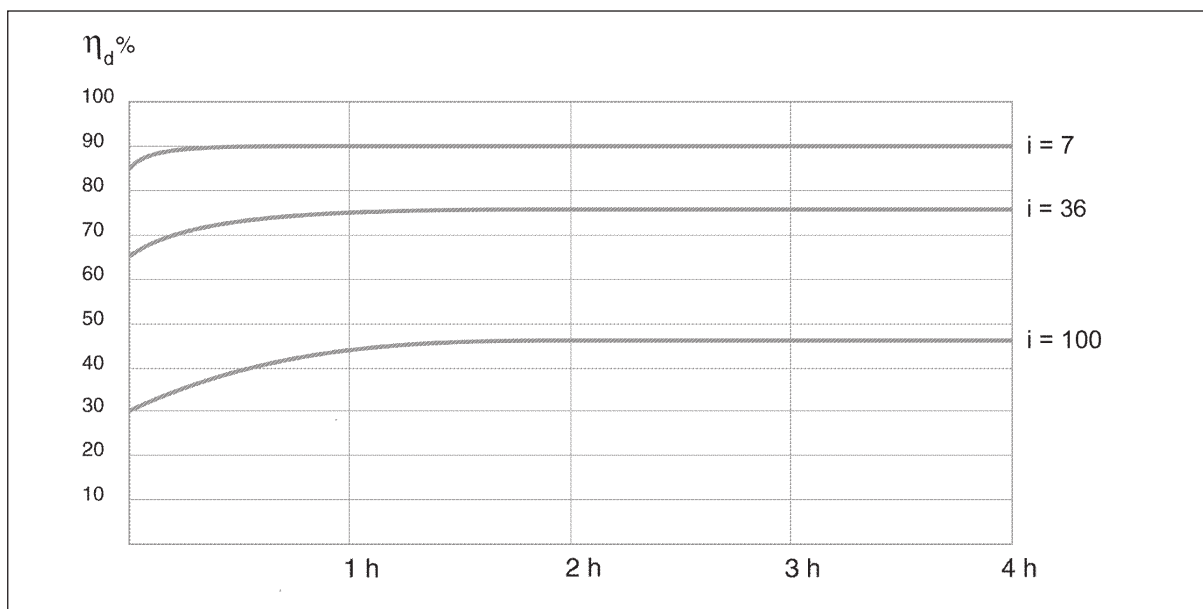
## 18 RENDIMENTO

Il rendimento  $[\eta]$  dipende dai seguenti parametri:

- angolo d'elica dell'ingranaggio
- velocità di comando
- rodaggio dell'ingranaggio

A tale proposito è utile ricordare che il valore ottimale si manifesta dopo alcune ore di rodaggio e viene raggiunto successivamente nei riduttori funzionanti a regime come illustrato nella tabella sotto riportata, per cui in determinate applicazioni dove è previsto un servizio intermittente (sollevamenti, azionamenti, ecc.) è necessario incrementare adeguatamente la potenza del motore al fine di compensare il basso rendimento che si ha nel riduttore all'avviamento.

I valori di coppia nominale  $M_{n2}$  riportati a catalogo sono riferiti al funzionamento a regime, dopo rodaggio. La tabella riporta, a titolo indicativo, il tempo necessario per raggiungere il massimo valore di rendimento dinamico.



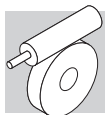
## 19 IRREVERSIBILITÀ

Alcune applicazioni possono comportare occasionalmente la trasmissione del moto retrogrado tramite l'albero lento, mentre altre impongono che il carico sia trattenuto in posizione dal motoriduttore, anche in assenza di alimentazione elettrica.

Alcuni gruppi a vite senza fine offrono la caratteristica di essere irreversibili e il parametro che ne influenza maggiormente questa prestazione è il rendimento.

In particolare il rendimento statico  $\eta_s$  è responsabile della irreversibilità statica (passaggio attraverso una posizione di sosta), mentre il rendimento dinamico  $\eta_d$  è responsabile della eventuale irreversibilità dinamica (moto continuato nella stessa direzione).

L'irreversibilità può esprimersi in misura diversa con i rapporti più lunghi ( $i=64$  e superiori) ad offrire una irreversibilità sempre maggiore.



## 19.1 Irreversibilità statica

Con questa condizione non si può avere la trasmissione del moto con comando dall'asse lento senza escludere però dei ritorni lenti nel caso in cui il gruppo sia sottoposto a vibrazioni. La condizione teorica perchè si verifichi la irreversibilità statica è la seguente:

$$\eta_s < 0.4 - 0.5 \quad (15)$$

dove  $\eta_s$  rappresenta il rendimento statico (valore riportato nelle tabelle dei dati tecnici dei riduttori). Ovviamente, per soddisfare la condizione inversa, cioè la reversibilità statica, si dovrà verificare che:

$$\eta_s > 0.5 \quad (16)$$

## 19.2 Irreversibilità dinamica

La condizione è influenzata direttamente dalla velocità di rotazione, dal rendimento e dalle vibrazioni continue del carico. È caratterizzata da un arresto quasi istantaneo della rotazione quando sull'asse della vite non ci sono più condizioni di moto. Essa è sottoposta alla condizione teorica:

$$\eta_d < 0.5 \quad (17)$$

dove  $\eta_d$  rappresenta il rendimento dinamico del riduttore nelle condizioni di esercizio (valore riportato nelle tabelle dei dati tecnici).

La condizione inversa, cioè di reversibilità dinamica, è fisicamente possibile quando:

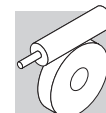
$$\eta_d > 0.5 \quad (18)$$

La tabella di seguito propone indicativamente i vari gradi di reversibilità in funzione del tipo di riduttore e del rapporto di riduzione (dati riferiti solo alla coppia vite-corona).

Ovviamente questi dati sono indicativi in quanto si può avere una irreversibilità più o meno accentuata a causa dell'influenza dei fattori citati precedentemente.



**Essendo praticamente impossibile realizzare e garantire una irreversibilità totale è necessario, dove esiste questa esigenza, prevedere un freno esterno sufficiente ad impedire l'avviamento per effetto delle vibrazioni.**



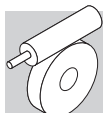
|                       |                        | Grado di reversibilità |                |                |                      |                      |                      |                      |                      |                            |                            |                      |                      |                      |
|-----------------------|------------------------|------------------------|----------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------------|----------------------------|----------------------|----------------------|----------------------|
|                       |                        | VF                     |                |                |                      | W                    |                      |                      |                      | VF                         |                            |                      |                      |                      |
| Reversibilità statica | Reversibilità dinamica | 27                     | 30             | 44             | 49                   | 63                   | 75                   | 86                   | 110                  | 130                        | 150                        | 185                  | 210                  | 250                  |
| <b>sì</b>             | <b>sì</b>              | —                      | —              | 7              | 7                    | 7                    | 7                    | 7                    | 7                    | 7                          | 7                          | 7                    | 7                    | 7                    |
| <b>sì</b>             | <b>sì</b>              | 7<br>10                | 7<br>10        | 10<br>14       | 10<br>14             | 10<br>12<br>15       | 10<br>15             | 10<br>15<br>20<br>23 | 10<br>15<br>20<br>23 | 10<br>15<br>20<br>23       | 10<br>15<br>20<br>23       | 10<br>15<br>20<br>23 | 10<br>15<br>20<br>23 | 10<br>15<br>20<br>23 |
| <b>incerta</b>        | <b>sì</b>              | 15<br>20<br>30         | 15<br>20<br>30 | 20<br>28<br>35 | 18<br>24<br>28<br>36 | 19<br>24<br>30<br>38 | 20<br>25<br>30<br>40 | 30<br>40<br>46<br>56 | 30<br>40<br>46<br>56 | 30<br>40<br>46<br>56<br>64 | 30<br>40<br>46<br>56<br>64 | 30<br>40<br>50<br>60 | 30<br>40<br>50<br>60 | 30<br>40<br>50<br>60 |
| <b>no</b>             | <b>bassa</b>           | 40<br>60               | 40<br>60       | 46<br>60<br>70 | 45<br>60<br>70       | 45<br>64<br>80       | 50<br>60<br>80       | 64<br>80<br>100      | 64<br>80<br>100      | 80<br>100                  | 80<br>100                  | 80<br>100            | 60<br>80<br>100      | 80<br>100            |
| <b>no</b>             | <b>no</b>              | 70                     | 70             | 100            | 80<br>100            | 100                  | 100                  | —                    | —                    | —                          | —                          | —                    | —                    | —                    |

## 20 GIOCHI ANGOLARI

La tabella seguente riporta i valori indicativi del gioco angolare riferito all'albero lento, con albero veloce quindi bloccato.

La misura avviene con l'applicazione di una coppia di 5 Nm all'albero lento.

| Giochi angolari (albero veloce bloccato) |                    |                      |
|------------------------------------------|--------------------|----------------------|
|                                          | $\Delta\gamma$ ['] | $\Delta\gamma$ [rad] |
| <b>VF 30</b>                             | 33' ± 10'          | 0.00873 ± 0.00291    |
| <b>VF 44</b>                             | 25' ± 7'           | 0.00728 ± 0.00145    |
| <b>VFR 44</b>                            | 30' ± 10'          | 0.00873 ± 0.00291    |
| <b>VF 49</b>                             | 22' ± 7'           | 0.00728 ± 0.00145    |
| <b>VFR 49</b>                            | 30' ± 10'          | 0.00873 ± 0.00291    |
| <b>W 63</b>                              | 20' ± 4'           | 0.00582 ± 0.00145    |
| <b>WR 63</b>                             | 25' ± 5'           | 0.00728 ± 0.00145    |
| <b>W 75</b>                              | 18' ± 4'           | 0.00582 ± 0.00145    |
| <b>WR 75</b>                             | 22' ± 5'           | 0.00640 ± 0.00145    |
| <b>W 86</b>                              | 15' ± 4'           | 0.00436 ± 0.00145    |
| <b>WR 86</b>                             | 20' ± 5'           | 0.00582 ± 0.00145    |
| <b>W 110</b>                             | 9' ± 2'            | 0.00436 ± 0.00145    |
| <b>WR 110</b>                            | 18' ± 5'           | 0.00524 ± 0.00145    |
| <b>VF 130</b>                            | 12' ± 3'           | 0.00349 ± 0.00087    |
| <b>VFR 130</b>                           | 15' ± 3'           | 0.00436 ± 0.00087    |
| <b>VF 150</b>                            | 12' ± 3'           | 0.00349 ± 0.00087    |
| <b>VFR 150</b>                           | 15' ± 3'           | 0.00436 ± 0.00087    |
| <b>VF 185</b>                            | 10' ± 3'           | 0.00291 ± 0.00087    |
| <b>VFR 185</b>                           | 13' ± 3'           | 0.00378 ± 0.00087    |
| <b>VF 210</b>                            | Interpellarci      |                      |
| <b>VFR 210</b>                           |                    |                      |
| <b>VF 250</b>                            |                    |                      |
| <b>VFR 250</b>                           |                    |                      |



## 21 DATI TECNICI MOTORIDUTTORI

### 0.04 kW

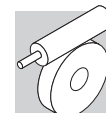
| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 19.3                                | 9                    | 1.0 | 70 | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_70                                                                            | P27                                                                                 | BN27A4                                                                                  | 111                                                                                 |
| 22.5                                | 8                    | 1.1 | 60 | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_60                                                                            | P27                                                                                 | BN27A4                                                                                  | 111                                                                                 |
| 34                                  | 6                    | 1.4 | 40 | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_40                                                                            | P27                                                                                 | BN27A4                                                                                  | 111                                                                                 |
| 45                                  | 5                    | 1.7 | 30 | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_30                                                                            | P27                                                                                 | BN27A4                                                                                  | 111                                                                                 |
| 68                                  | 4                    | 2.2 | 20 | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_20                                                                            | P27                                                                                 | BN27A4                                                                                  | 111                                                                                 |
| 90                                  | 3                    | 2.8 | 15 | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_15                                                                            | P27                                                                                 | BN27A4                                                                                  | 111                                                                                 |
| 135                                 | 2                    | 3.8 | 10 | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_10                                                                            | P27                                                                                 | BN27A4                                                                                  | 111                                                                                 |
| 193                                 | 2                    | 5.5 | 7  | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_7                                                                             | P27                                                                                 | BN27A4                                                                                  | 111                                                                                 |

### 0.06 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i    | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|------|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 0.59                                | 203                  | 1.0 | 2280 | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_2280                                                                     | P56                                                                                 | BN56A4                                                                                  | 129                                                                                 |
| 0.89                                | 155                  | 1.4 | 1520 | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_1520                                                                     | P56                                                                                 | BN56A4                                                                                  | 129                                                                                 |
| 1.1                                 | 122                  | 1.7 | 1200 | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_1200                                                                     | P56                                                                                 | BN56A4                                                                                  | 129                                                                                 |
| 1.5                                 | 115                  | 1.8 | 900  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_900                                                                      | P56                                                                                 | BN56A4                                                                                  | 129                                                                                 |
| 1.9                                 | 113                  | 1.9 | 720  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_720                                                                      | P56                                                                                 | BN56A4                                                                                  | 129                                                                                 |
| 2.5                                 | 85                   | 1.1 | 540  | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 30/49_540                                                                     | P56                                                                                 | BN56A4                                                                                  | 124                                                                                 |
| 2.8                                 | 50                   | 1.0 | 500  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 44_500                                                                          | S44                                                                                 | BN44B4                                                                                  | 116                                                                                 |
| 3.2                                 | 73                   | 1.3 | 420  | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 30/49_420                                                                     | P56                                                                                 | BN56A4                                                                                  | 124                                                                                 |
| 4.0                                 | 54                   | 1.0 | 350  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 44_350                                                                          | S44                                                                                 | BN44B4                                                                                  | 116                                                                                 |
| 4.3                                 | 53                   | 1.8 | 315  | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 30/49_315                                                                     | P56                                                                                 | BN56A4                                                                                  | 124                                                                                 |
| 4.5                                 | 59                   | 1.0 | 300  | 2500                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 44_300                                                                          | S44                                                                                 | BN44B4                                                                                  | 116                                                                                 |
| 5.8                                 | 50                   | 1.2 | 230  | 2500                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 44_230                                                                          | S44                                                                                 | BN44B4                                                                                  | 116                                                                                 |
| 7.7                                 | 42                   | 1.5 | 175  | 2500                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 44_175                                                                          | S44                                                                                 | BN44B4                                                                                  | 116                                                                                 |
| 9.6                                 | 36                   | 1.4 | 140  | 2500                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 44_140                                                                          | S44                                                                                 | BN44B4                                                                                  | 116                                                                                 |
| 13.4                                | 29                   | 1.8 | 100  | 2500                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 44_100                                                                          | S44                                                                                 | BN44B4                                                                                  | 116                                                                                 |
| 19.1                                | 22                   | 1.8 | 70   | 2500                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 44_70                                                                           | S44                                                                                 | BN44B4                                                                                  | 116                                                                                 |
| 19.3                                | 14                   | 1.1 | 70   | 1600                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_70                                                                            | P56                                                                                 | BN56A4                                                                                  | 112                                                                                 |
| 22.5                                | 13                   | 1.5 | 60   | 1600                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_60                                                                            | P56                                                                                 | BN56A4                                                                                  | 112                                                                                 |
| 34                                  | 10                   | 0.9 | 40   | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_40                                                                            | P27                                                                                 | BN27B4                                                                                  | 111                                                                                 |
| 34                                  | 10                   | 1.9 | 40   | 1650                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_40                                                                            | P56                                                                                 | BN56A4                                                                                  | 112                                                                                 |
| 45                                  | 8                    | 1.1 | 30   | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_30                                                                            | P27                                                                                 | BN27B4                                                                                  | 111                                                                                 |
| 45                                  | 8                    | 2.4 | 30   | 1340                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_30                                                                            | P56                                                                                 | BN56A4                                                                                  | 112                                                                                 |
| 68                                  | 6                    | 1.5 | 20   | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_20                                                                            | P27                                                                                 | BN27B4                                                                                  | 111                                                                                 |
| 68                                  | 6                    | 2.9 | 20   | 1180                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_20                                                                            | P56                                                                                 | BN56A4                                                                                  | 112                                                                                 |
| 90                                  | 5                    | 1.9 | 15   | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_15                                                                            | P27                                                                                 | BN27B4                                                                                  | 111                                                                                 |
| 90                                  | 5                    | 3.7 | 15   | 1080                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_15                                                                            | P56                                                                                 | BN56A4                                                                                  | 112                                                                                 |
| 135                                 | 4                    | 2.6 | 10   | 595                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_10                                                                            | P27                                                                                 | BN27B4                                                                                  | 111                                                                                 |
| 135                                 | 3                    | 4.7 | 10   | 950                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_10                                                                            | P56                                                                                 | BN56A4                                                                                  | 112                                                                                 |
| 193                                 | 2                    | 3.6 | 7    | 533                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_7                                                                             | P27                                                                                 | BN27B4                                                                                  | 111                                                                                 |
| 193                                 | 2                    | 6.4 | 7    | 840                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_7                                                                             | P56                                                                                 | BN56A4                                                                                  | 112                                                                                 |

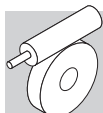
### 0.09 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i    | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|------|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 0.31                                | 574                  | 1.8 | 2800 | 8000                 | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 49/110_2800                                                                      | P63                                                                                   | BN63A6                                                                                    | 141                                                                                   |
| 0.42                                | 579                  | 1.0 | 2116 | 7000                 | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 44/86_2116                                                                       | P63                                                                                   | BN63A6                                                                                    | 137                                                                                   |
| 0.43                                | 505                  | 2.1 | 2070 | 8000                 | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 49/110_2070                                                                      | P63                                                                                   | BN63A6                                                                                    | 141                                                                                   |
| 0.48                                | 503                  | 1.1 | 1840 | 7000                 | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 44/86_1840                                                                       | P63                                                                                   | BN63A6                                                                                    | 137                                                                                   |
| 0.53                                | 485                  | 2.2 | 1656 | 8000                 | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 49/110_1656                                                                      | P63                                                                                   | BN63A6                                                                                    | 141                                                                                   |
| 0.64                                | 377                  | 1.5 | 1380 | 7000                 | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 44/86_1380                                                                       | P63                                                                                   | BN63A6                                                                                    | 137                                                                                   |
| 0.65                                | 369                  | 2.8 | 1350 | 8000                 | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 49/110_1350                                                                      | P63                                                                                   | BN63A6                                                                                    | 141                                                                                   |



## 0.09 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i    | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|------|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 0.73                    | 363                  | 1.1 | 1200 | 5750                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/75_1200                                                                     | P63                                                                                 | BN63A6                                                                                  | 133                                                                                 |
| 0.81                    | 316                  | 3.3 | 1080 | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_1080                                                                    | P63                                                                                 | BN63A6                                                                                  | 141                                                                                 |
| 0.89                    | 232                  | 0.9 | 1520 | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_1520                                                                     | P56                                                                                 | BN56B4                                                                                  | 129                                                                                 |
| 0.96                    | 323                  | 1.2 | 920  | 5750                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/75_920                                                                      | P63                                                                                 | BN63A6                                                                                  | 133                                                                                 |
| 0.96                    | 332                  | 1.7 | 920  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_920                                                                      | P63                                                                                 | BN63A6                                                                                  | 137                                                                                 |
| 0.98                    | 255                  | 0.9 | 900  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_900                                                                      | P63                                                                                 | BN63A6                                                                                  | 129                                                                                 |
| 1.1                     | 183                  | 1.1 | 1200 | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_1200                                                                     | P56                                                                                 | BN56B4                                                                                  | 129                                                                                 |
| 1.2                     | 225                  | 1.0 | 720  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_720                                                                      | P63                                                                                 | BN63A6                                                                                  | 129                                                                                 |
| 1.3                     | 267                  | 1.5 | 700  | 5750                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/75_700                                                                      | P63                                                                                 | BN63A6                                                                                  | 133                                                                                 |
| 1.3                     | 253                  | 2.2 | 700  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_700                                                                      | P63                                                                                 | BN63A6                                                                                  | 137                                                                                 |
| 1.5                     | 172                  | 1.2 | 900  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_900                                                                      | P56                                                                                 | BN56B4                                                                                  | 129                                                                                 |
| 1.7                     | 210                  | 1.9 | 525  | 5750                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/75_525                                                                      | P63                                                                                 | BN63A6                                                                                  | 133                                                                                 |
| 1.7                     | 200                  | 2.8 | 525  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_525                                                                      | P63                                                                                 | BN63A6                                                                                  | 137                                                                                 |
| 1.9                     | 170                  | 1.2 | 720  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_720                                                                      | P56                                                                                 | BN56B4                                                                                  | 129                                                                                 |
| 2.2                     | 164                  | 2.4 | 400  | 5750                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/75_400                                                                      | P63                                                                                 | BN63A6                                                                                  | 133                                                                                 |
| 2.2                     | 160                  | 3.4 | 400  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_400                                                                      | P63                                                                                 | BN63A6                                                                                  | 137                                                                                 |
| 2.4                     | 145                  | 1.4 | 570  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_570                                                                      | P56                                                                                 | BN56B4                                                                                  | 129                                                                                 |
| 2.9                     | 111                  | 1.2 | 300  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_300                                                                           | P63                                                                                 | BN63A6                                                                                  | 128                                                                                 |
| 2.9                     | 120                  | 1.7 | 300  | 6200                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 75_300                                                                           | P63                                                                                 | BN63A6                                                                                  | 132                                                                                 |
| 2.9                     | 132                  | 2.4 | 300  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_300                                                                           | P63                                                                                 | BN63A6                                                                                  | 136                                                                                 |
| 3.0                     | 117                  | 1.8 | 450  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_450                                                                      | P56                                                                                 | BN56B4                                                                                  | 129                                                                                 |
| 3.2                     | 110                  | 0.9 | 420  | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 30/49_420                                                                     | P56                                                                                 | BN56B4                                                                                  | 124                                                                                 |
| 3.7                     | 101                  | 1.4 | 240  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_240                                                                           | P63                                                                                 | BN63A6                                                                                  | 128                                                                                 |
| 3.7                     | 105                  | 2.1 | 240  | 6200                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 75_240                                                                           | P63                                                                                 | BN63A6                                                                                  | 132                                                                                 |
| 3.7                     | 117                  | 2.6 | 240  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_240                                                                           | P63                                                                                 | BN63A6                                                                                  | 136                                                                                 |
| 4.2                     | 84                   | 0.9 | 210  | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_210                                                                          | P63                                                                                 | BN63A6                                                                                  | 122                                                                                 |
| 4.3                     | 80                   | 1.2 | 315  | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 30/49_315                                                                     | P56                                                                                 | BN56B4                                                                                  | 124                                                                                 |
| 4.3                     | 84                   | 2.5 | 315  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_315                                                                      | P56                                                                                 | BN56B4                                                                                  | 129                                                                                 |
| 4.6                     | 88                   | 1.7 | 192  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_192                                                                           | P63                                                                                 | BN63A6                                                                                  | 128                                                                                 |
| 4.9                     | 79                   | 0.9 | 180  | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_180                                                                          | P63                                                                                 | BN63A6                                                                                  | 122                                                                                 |
| 4.9                     | 90                   | 3.1 | 180  | 6200                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 75_180                                                                           | P63                                                                                 | BN63A6                                                                                  | 132                                                                                 |
| 5.2                     | 94                   | 4.2 | 168  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_168                                                                           | P63                                                                                 | BN63A6                                                                                  | 136                                                                                 |
| 5.5                     | 62                   | 1.0 | 245  | 2500                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 30/44_245                                                                     | P56                                                                                 | BN56B4                                                                                  | 118                                                                                 |
| 6.5                     | 66                   | 1.2 | 135  | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_135                                                                          | P63                                                                                 | BN63A6                                                                                  | 122                                                                                 |
| 6.5                     | 71                   | 2.5 | 135  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_135                                                                           | P63                                                                                 | BN63A6                                                                                  | 128                                                                                 |
| 7.7                     | 63                   | 1.0 | 175  | 2900                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 44_175                                                                          | S44                                                                                 | BN44C4                                                                                  | 116                                                                                 |
| 7.7                     | 65                   | 3.1 | 114  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_114                                                                           | P63                                                                                 | BN63A6                                                                                  | 128                                                                                 |
| 8.1                     | 58                   | 1.4 | 108  | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_108                                                                          | P63                                                                                 | BN63A6                                                                                  | 122                                                                                 |
| 8.8                     | 41                   | 1.3 | 100  | 3300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_100                                                                           | P63                                                                                 | BN63A6                                                                                  | 120                                                                                 |
| 9.6                     | 54                   | 0.9 | 140  | 2900                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 44_140                                                                          | S44                                                                                 | BN44C4                                                                                  | 116                                                                                 |
| 9.8                     | 55                   | 3.8 | 90   | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_90                                                                            | P63                                                                                 | BN63A6                                                                                  | 128                                                                                 |
| 10.5                    | 48                   | 1.9 | 84   | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_84                                                                           | P63                                                                                 | BN63A6                                                                                  | 122                                                                                 |
| 11.0                    | 37                   | 1.6 | 80   | 3300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_80                                                                            | P63                                                                                 | BN63A6                                                                                  | 120                                                                                 |
| 12.2                    | 45                   | 1.8 | 72   | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_72                                                                           | P63                                                                                 | BN63A6                                                                                  | 122                                                                                 |
| 12.2                    | 48                   | 4.0 | 72   | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_72                                                                            | P63                                                                                 | BN63A6                                                                                  | 128                                                                                 |
| 12.6                    | 35                   | 1.1 | 70   | 2300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_70                                                                            | P63                                                                                 | BN63A6                                                                                  | 114                                                                                 |
| 12.6                    | 34                   | 1.8 | 70   | 3300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_70                                                                            | P63                                                                                 | BN63A6                                                                                  | 120                                                                                 |
| 13.4                    | 43                   | 1.2 | 100  | 2900                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 44_100                                                                          | S44                                                                                 | BN44C4                                                                                  | 116                                                                                 |
| 14.7                    | 32                   | 1.4 | 60   | 2300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_60                                                                            | P63                                                                                 | BN63A6                                                                                  | 114                                                                                 |
| 14.7                    | 34                   | 1.7 | 60   | 3300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_60                                                                            | P63                                                                                 | BN63A6                                                                                  | 120                                                                                 |
| 16.3                    | 36                   | 2.2 | 54   | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_54                                                                           | P63                                                                                 | BN63A6                                                                                  | 122                                                                                 |
| 19.1                    | 33                   | 1.2 | 70   | 2900                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 44_70                                                                           | S44                                                                                 | BN44C4                                                                                  | 116                                                                                 |
| 19.1                    | 27                   | 1.8 | 46   | 2300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_46                                                                            | P63                                                                                 | BN63A6                                                                                  | 114                                                                                 |
| 19.6                    | 26                   | 2.7 | 45   | 3300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_45                                                                            | P63                                                                                 | BN63A6                                                                                  | 120                                                                                 |
| 21.0                    | 30                   | 2.8 | 42   | 3360                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_42                                                                           | P63                                                                                 | BN63A6                                                                                  | 122                                                                                 |
| 22.0                    | 22                   | 0.9 | 40   | 1560                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_40                                                                            | P63                                                                                 | BN63A6                                                                                  | 112                                                                                 |
| 22.5                    | 19                   | 1.0 | 60   | 1600                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_60                                                                            | P56                                                                                 | BN56B4                                                                                  | 112                                                                                 |
| 24.4                    | 22                   | 3.4 | 36   | 3300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_36                                                                            | P63                                                                                 | BN63A6                                                                                  | 120                                                                                 |
| 25.1                    | 22                   | 2.2 | 35   | 2300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_35                                                                            | P63                                                                                 | BN63A6                                                                                  | 114                                                                                 |
| 29.3                    | 18                   | 1.2 | 30   | 1440                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_30                                                                            | P63                                                                                 | BN63A6                                                                                  | 112                                                                                 |
| 31                      | 18                   | 2.7 | 28   | 2300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_28                                                                            | P63                                                                                 | BN63A6                                                                                  | 114                                                                                 |
| 34                      | 15                   | 1.2 | 40   | 1410                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_40                                                                            | P56                                                                                 | BN56B4                                                                                  | 112                                                                                 |
| 44                      | 14                   | 1.5 | 20   | 1230                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_20                                                                            | P63                                                                                 | BN63A6                                                                                  | 112                                                                                 |
| 44                      | 14                   | 3.1 | 20   | 2300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_20                                                                            | P63                                                                                 | BN63A6                                                                                  | 114                                                                                 |
| 45                      | 12                   | 1.6 | 30   | 1290                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_30                                                                            | P56                                                                                 | BN56B4                                                                                  | 112                                                                                 |
| 59                      | 11                   | 1.8 | 15   | 1170                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_15                                                                            | P63                                                                                 | BN63A6                                                                                  | 112                                                                                 |
| 68                      | 9                    | 1.9 | 20   | 1140                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_20                                                                            | P56                                                                                 | BN56B4                                                                                  | 112                                                                                 |
| 69                      | 9                    | 1.0 | 20   | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_20                                                                            | P27                                                                                 | BN27C4                                                                                  | 111                                                                                 |
| 88                      | 8                    | 2.3 | 10   | 1050                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_10                                                                            | P63                                                                                 | BN63A6                                                                                  | 112                                                                                 |
| 90                      | 7                    | 2.5 | 15   | 1050                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_15                                                                            | P56                                                                                 | BN56B4                                                                                  | 112                                                                                 |
| 92                      | 7                    | 1.3 | 15   | 600                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_15                                                                            | P27                                                                                 | BN27C4                                                                                  | 111                                                                                 |

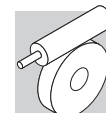


## 0.09 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 126                                 | 6                    | 3.2 | 7  | 920                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_7                                                                             | P63                                                                                 | BN63A6                                                                                  | 112                                                                                 |
| 135                                 | 5                    | 3.1 | 10 | 920                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_10                                                                            | P56                                                                                 | BN56B4                                                                                  | 112                                                                                 |
| 138                                 | 5                    | 1.7 | 10 | 565                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_10                                                                            | P27                                                                                 | BN27C4                                                                                  | 111                                                                                 |
| 193                                 | 4                    | 4.3 | 7  | 820                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_7                                                                             | P56                                                                                 | BN56B4                                                                                  | 112                                                                                 |
| 197                                 | 4                    | 2.5 | 7  | 510                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_7                                                                             | P27                                                                                 | BN27C4                                                                                  | 111                                                                                 |

## 0.12 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i    | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|------|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 0.31                                | 775                  | 1.4 | 2800 | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_2800                                                                    | P63                                                                                 | BN63B6                                                                                  | 141                                                                                 |
| 0.47                                | 588                  | 1.7 | 2800 | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_2800                                                                    | P63                                                                                 | BN63A4                                                                                  | 141                                                                                 |
| 0.53                                | 654                  | 1.6 | 1656 | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_1656                                                                    | P63                                                                                 | BN63B6                                                                                  | 141                                                                                 |
| 0.62                                | 518                  | 1.0 | 2116 | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_2116                                                                     | P63                                                                                 | BN63A4                                                                                  | 137                                                                                 |
| 0.63                                | 507                  | 2.0 | 2070 | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_2070                                                                    | P63                                                                                 | BN63A4                                                                                  | 141                                                                                 |
| 0.71                                | 483                  | 1.0 | 1840 | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_1840                                                                     | P63                                                                                 | BN63A4                                                                                  | 137                                                                                 |
| 0.79                                | 435                  | 2.3 | 1656 | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_1656                                                                    | P63                                                                                 | BN63A4                                                                                  | 141                                                                                 |
| 0.95                                | 386                  | 1.3 | 1380 | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_1380                                                                     | P63                                                                                 | BN63A4                                                                                  | 137                                                                                 |
| 0.97                                | 354                  | 2.8 | 1350 | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_1350                                                                    | P63                                                                                 | BN63A4                                                                                  | 141                                                                                 |
| 1.2                                 | 293                  | 3.4 | 1080 | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_1080                                                                    | P63                                                                                 | BN63A4                                                                                  | 141                                                                                 |
| 1.4                                 | 322                  | 1.1 | 920  | 5750                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/75_920                                                                      | P63                                                                                 | BN63A4                                                                                  | 133                                                                                 |
| 1.4                                 | 322                  | 1.6 | 920  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_920                                                                      | P63                                                                                 | BN63A4                                                                                  | 137                                                                                 |
| 1.5                                 | 236                  | 0.9 | 900  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_900                                                                      | P63                                                                                 | BN63A4                                                                                  | 129                                                                                 |
| 1.8                                 | 233                  | 0.9 | 720  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_720                                                                      | P63                                                                                 | BN63A4                                                                                  | 129                                                                                 |
| 1.9                                 | 257                  | 1.4 | 700  | 5750                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/75_700                                                                      | P63                                                                                 | BN63A4                                                                                  | 133                                                                                 |
| 1.9                                 | 239                  | 2.1 | 700  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_700                                                                      | P63                                                                                 | BN63A4                                                                                  | 137                                                                                 |
| 2.3                                 | 199                  | 1.1 | 570  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_570                                                                      | P63                                                                                 | BN63A4                                                                                  | 129                                                                                 |
| 2.5                                 | 202                  | 1.8 | 525  | 5750                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/75_525                                                                      | P63                                                                                 | BN63A4                                                                                  | 133                                                                                 |
| 2.5                                 | 193                  | 2.6 | 525  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_525                                                                      | P63                                                                                 | BN63A4                                                                                  | 137                                                                                 |
| 2.9                                 | 150                  | 0.9 | 300  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_300                                                                           | P63                                                                                 | BN63B6                                                                                  | 128                                                                                 |
| 2.9                                 | 162                  | 1.2 | 300  | 6200                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 75_300                                                                           | P63                                                                                 | BN63B6                                                                                  | 132                                                                                 |
| 2.9                                 | 178                  | 1.7 | 300  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_300                                                                           | P63                                                                                 | BN63B6                                                                                  | 136                                                                                 |
| 2.9                                 | 161                  | 1.3 | 450  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_450                                                                      | P63                                                                                 | BN63A4                                                                                  | 129                                                                                 |
| 3.3                                 | 161                  | 2.3 | 400  | 5750                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/75_400                                                                      | P63                                                                                 | BN63A4                                                                                  | 133                                                                                 |
| 3.3                                 | 143                  | 3.5 | 400  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_400                                                                      | P63                                                                                 | BN63A4                                                                                  | 137                                                                                 |
| 3.6                                 | 136                  | 1.0 | 240  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_240                                                                           | P63                                                                                 | BN63B6                                                                                  | 128                                                                                 |
| 3.6                                 | 142                  | 1.5 | 240  | 6200                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 75_240                                                                           | P63                                                                                 | BN63B6                                                                                  | 132                                                                                 |
| 3.6                                 | 142                  | 1.6 | 240  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_240                                                                      | P63                                                                                 | BN63B6                                                                                  | 129                                                                                 |
| 3.6                                 | 158                  | 2.0 | 240  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_240                                                                           | P63                                                                                 | BN63B6                                                                                  | 136                                                                                 |
| 4.2                                 | 110                  | 0.9 | 315  | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 30/49_315                                                                     | P63                                                                                 | BN63A4                                                                                  | 124                                                                                 |
| 4.2                                 | 116                  | 1.8 | 315  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_315                                                                      | P63                                                                                 | BN63A4                                                                                  | 129                                                                                 |
| 4.4                                 | 108                  | 1.2 | 300  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_300                                                                           | P63                                                                                 | BN63A4                                                                                  | 128                                                                                 |
| 4.4                                 | 115                  | 1.6 | 300  | 6200                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 75_300                                                                           | P63                                                                                 | BN63A4                                                                                  | 132                                                                                 |
| 4.4                                 | 129                  | 2.1 | 300  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_300                                                                           | P63                                                                                 | BN63A4                                                                                  | 136                                                                                 |
| 4.4                                 | 134                  | 2.8 | 300  | 5750                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/75_300                                                                      | P63                                                                                 | BN63A4                                                                                  | 133                                                                                 |
| 4.8                                 | 121                  | 2.3 | 180  | 6200                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 75_180                                                                           | P63                                                                                 | BN63B6                                                                                  | 132                                                                                 |
| 5.2                                 | 126                  | 3.1 | 168  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_168                                                                           | P63                                                                                 | BN63B6                                                                                  | 136                                                                                 |
| 5.2                                 | 125                  | 3.0 | 250  | 5750                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/75_250                                                                      | P63                                                                                 | BN63A4                                                                                  | 133                                                                                 |
| 5.5                                 | 94                   | 1.0 | 240  | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 30/49_240                                                                     | P63                                                                                 | BN63A4                                                                                  | 124                                                                                 |
| 5.5                                 | 97                   | 1.4 | 240  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_240                                                                           | P63                                                                                 | BN63A4                                                                                  | 128                                                                                 |
| 5.5                                 | 103                  | 2.1 | 240  | 6200                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 75_240                                                                           | P63                                                                                 | BN63A4                                                                                  | 132                                                                                 |
| 5.5                                 | 99                   | 2.1 | 240  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 30/63_240                                                                      | P63                                                                                 | BN63A4                                                                                  | 129                                                                                 |
| 5.5                                 | 111                  | 2.7 | 240  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_240                                                                           | P63                                                                                 | BN63A4                                                                                  | 136                                                                                 |
| 5.8                                 | 109                  | 2.9 | 150  | 6200                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 75_150                                                                           | P63                                                                                 | BN63B6                                                                                  | 132                                                                                 |
| 6.4                                 | 89                   | 0.9 | 135  | 3300                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_135                                                                          | P63                                                                                 | BN63B6                                                                                  | 122                                                                                 |
| 6.4                                 | 96                   | 1.9 | 135  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_135                                                                           | P63                                                                                 | BN63B6                                                                                  | 128                                                                                 |
| 6.8                                 | 86                   | 1.8 | 192  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_192                                                                           | P63                                                                                 | BN63A4                                                                                  | 128                                                                                 |
| 7.3                                 | 76                   | 0.9 | 180  | 3300                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_180                                                                          | P63                                                                                 | BN63A4                                                                                  | 122                                                                                 |
| 7.3                                 | 87                   | 2.7 | 180  | 6200                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 75_180                                                                           | P63                                                                                 | BN63A4                                                                                  | 132                                                                                 |
| 8.7                                 | 55                   | 0.9 | 100  | 3300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_100                                                                           | P63                                                                                 | BN63B6                                                                                  | 120                                                                                 |
| 9.7                                 | 64                   | 1.4 | 135  | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_135                                                                          | P63                                                                                 | BN63A4                                                                                  | 122                                                                                 |
| 9.7                                 | 68                   | 2.5 | 135  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_135                                                                           | P63                                                                                 | BN63A4                                                                                  | 128                                                                                 |
| 10.9                                | 50                   | 1.2 | 80   | 3300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_80                                                                            | P63                                                                                 | BN63B6                                                                                  | 120                                                                                 |
| 11.5                                | 61                   | 3.0 | 114  | 5000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_114                                                                           | P63                                                                                 | BN63A4                                                                                  | 128                                                                                 |
| 12.1                                | 55                   | 1.5 | 108  | 3450                 | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_108                                                                          | P63                                                                                 | BN63A4                                                                                  | 122                                                                                 |
| 13.1                                | 41                   | 1.2 | 100  | 3150                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_100                                                                           | P63                                                                                 | BN63A4                                                                                  | 120                                                                                 |
| 14.5                                | 43                   | 1.1 | 60   | 2300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_60                                                                            | P63                                                                                 | BN63B6                                                                                  | 114                                                                                 |

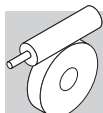


## 0.12 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i  | Rn2<br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|----|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 15.3                    | 53                   | 3.6 | 57 | 5000     | —                                                                                 | —                                                                                 | —                                                                                 | WR 63_57                                                                            | P63                                                                                 | BN63B6                                                                                  | 128                                                                                 |
| 15.6                    | 46                   | 1.9 | 84 | 3450     | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_84                                                                           | P63                                                                                 | BN63A4                                                                                  | 122                                                                                 |
| 16.4                    | 36                   | 1.5 | 80 | 3150     | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_80                                                                            | P63                                                                                 | BN63A4                                                                                  | 120                                                                                 |
| 18.2                    | 42                   | 1.8 | 72 | 3430     | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_72                                                                           | P63                                                                                 | BN63A4                                                                                  | 122                                                                                 |
| 18.7                    | 34                   | 0.9 | 70 | 3300     | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_70                                                                            | P63                                                                                 | BN63A4                                                                                  | 114                                                                                 |
| 18.7                    | 33                   | 1.7 | 70 | 3150     | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_70                                                                            | P63                                                                                 | BN63A4                                                                                  | 120                                                                                 |
| 21.8                    | 30                   | 1.3 | 60 | 2300     | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_60                                                                            | P63                                                                                 | BN63A4                                                                                  | 114                                                                                 |
| 21.8                    | 30                   | 1.9 | 60 | 3150     | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_60                                                                            | P63                                                                                 | BN63A4                                                                                  | 120                                                                                 |
| 24.3                    | 34                   | 2.2 | 54 | 3140     | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_54                                                                           | P63                                                                                 | BN63A4                                                                                  | 122                                                                                 |
| 28.5                    | 25                   | 1.5 | 46 | 2300     | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_46                                                                            | P63                                                                                 | BN63A4                                                                                  | 114                                                                                 |
| 29.0                    | 24                   | 0.9 | 30 | 1360     | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_30                                                                            | P63                                                                                 | BN63B6                                                                                  | 112                                                                                 |
| 29.1                    | 25                   | 2.6 | 45 | 3040     | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_45                                                                            | P63                                                                                 | BN63A4                                                                                  | 120                                                                                 |
| 31                      | 27                   | 2.9 | 42 | 2920     | —                                                                                 | —                                                                                 | —                                                                                 | VFR 49_42                                                                           | P63                                                                                 | BN63A4                                                                                  | 122                                                                                 |
| 33                      | 21                   | 0.9 | 40 | 1360     | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_40                                                                            | P63                                                                                 | BN63A4                                                                                  | 112                                                                                 |
| 36                      | 21                   | 3.3 | 36 | 2830     | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_36                                                                            | P63                                                                                 | BN63A4                                                                                  | 120                                                                                 |
| 37                      | 21                   | 1.9 | 35 | 2300     | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_35                                                                            | P63                                                                                 | BN63A4                                                                                  | 114                                                                                 |
| 44                      | 17                   | 1.2 | 30 | 1250     | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_30                                                                            | P63                                                                                 | BN63A4                                                                                  | 112                                                                                 |
| 47                      | 17                   | 2.2 | 28 | 2300     | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_28                                                                            | P63                                                                                 | BN63A4                                                                                  | 114                                                                                 |
| 58                      | 15                   | 1.4 | 15 | 1130     | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_15                                                                            | P63                                                                                 | BN63B6                                                                                  | 112                                                                                 |
| 62                      | 14                   | 2.7 | 14 | 2150     | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_14                                                                            | P63                                                                                 | BN63B6                                                                                  | 114                                                                                 |
| 66                      | 13                   | 1.4 | 20 | 1110     | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_20                                                                            | P63                                                                                 | BN63A4                                                                                  | 112                                                                                 |
| 66                      | 13                   | 2.9 | 20 | 2100     | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_20                                                                            | P63                                                                                 | BN63A4                                                                                  | 114                                                                                 |
| 87                      | 10                   | 1.8 | 15 | 1020     | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_15                                                                            | P63                                                                                 | BN63A4                                                                                  | 112                                                                                 |
| 94                      | 10                   | 2.9 | 14 | 1870     | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_14                                                                            | P63                                                                                 | BN63A4                                                                                  | 114                                                                                 |
| 124                     | 8                    | 2.4 | 7  | 900      | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_7                                                                             | P63                                                                                 | BN63B6                                                                                  | 112                                                                                 |
| 131                     | 7                    | 2.3 | 10 | 900      | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_10                                                                            | P63                                                                                 | BN63A4                                                                                  | 112                                                                                 |
| 138                     | 6                    | 1.1 | 20 | 560      | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_20                                                                            | P27                                                                                 | BN27C2                                                                                  | 111                                                                                 |
| 138                     | 7                    | 2.2 | 20 | 840      | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_20                                                                            | P56                                                                                 | BN56B2                                                                                  | 112                                                                                 |
| 183                     | 5                    | 1.4 | 15 | 520      | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_15                                                                            | P27                                                                                 | BN27C2                                                                                  | 111                                                                                 |
| 187                     | 5                    | 3.1 | 7  | 810      | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_7                                                                             | P63                                                                                 | BN63A4                                                                                  | 112                                                                                 |
| 275                     | 4                    | 2.0 | 10 | 460      | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_10                                                                            | P27                                                                                 | BN27C2                                                                                  | 111                                                                                 |
| 275                     | 4                    | 3.4 | 10 | 740      | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_10                                                                            | P56                                                                                 | BN56B2                                                                                  | 112                                                                                 |
| 393                     | 3                    | 2.8 | 7  | 410      | —                                                                                 | —                                                                                 | —                                                                                 | VF 27_7                                                                             | P27                                                                                 | BN27C2                                                                                  | 111                                                                                 |
| 393                     | 3                    | 4.7 | 7  | 660      | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_7                                                                             | P56                                                                                 | BN56B2                                                                                  | 112                                                                                 |

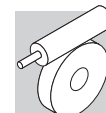
## 0.18 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i    | Rn2<br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|------|----------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 0.28                    | 978                  | 1.9 | 3200 | 13800    | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 63/130_3200                                                                      | P71                                                                                   | BN71A6                                                                                    | 146                                                                                   |
| 0.28                    | 1345                 | 3.3 | 3200 | 19500    | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 86/185_3200                                                                      | P71                                                                                   | BN71A6                                                                                    | 162                                                                                   |
| 0.31                    | 1406                 | 1.9 | 2944 | 16000    | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 86/150_2944                                                                      | P71                                                                                   | BN71A6                                                                                    | 154                                                                                   |
| 0.35                    | 1027                 | 1.8 | 2560 | 13800    | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 63/130_2560                                                                      | P71                                                                                   | BN71A6                                                                                    | 146                                                                                   |
| 0.35                    | 1320                 | 3.3 | 2560 | 19500    | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 86/185_2560                                                                      | P71                                                                                   | BN71A6                                                                                    | 162                                                                                   |
| 0.47                    | 875                  | 1.1 | 2800 | 8000     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 49/110_2800                                                                      | P63                                                                                   | BN63B4                                                                                    | 141                                                                                   |
| 0.49                    | 1265                 | 2.1 | 1840 | 16000    | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 86/150_1840                                                                      | P71                                                                                   | BN71A6                                                                                    | 154                                                                                   |
| 0.50                    | 894                  | 2.1 | 1800 | 13800    | —                                                                                   | —                                                                                   | —                                                                                   | W /VF 63/130_1800                                                                     | P71                                                                                   | BN71A6                                                                                    | 146                                                                                   |
| 0.54                    | 949                  | 1.1 | 1656 | 8000     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 49/110_1656                                                                      | P71                                                                                   | BN71A6                                                                                    | 141                                                                                   |
| 0.59                    | 871                  | 2.1 | 1520 | 13800    | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 63/130_1520                                                                      | P71                                                                                   | BN71A6                                                                                    | 146                                                                                   |
| 0.64                    | 755                  | 1.3 | 2070 | 8000     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 49/110_2070                                                                      | P63                                                                                   | BN63B4                                                                                    | 141                                                                                   |
| 0.65                    | 1054                 | 2.6 | 1380 | 16000    | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 86/150_1380                                                                      | P71                                                                                   | BN71A6                                                                                    | 154                                                                                   |
| 0.75                    | 733                  | 2.5 | 1200 | 13800    | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 63/130_1200                                                                      | P71                                                                                   | BN71A6                                                                                    | 146                                                                                   |
| 0.80                    | 647                  | 1.5 | 1656 | 8000     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 49/110_1656                                                                      | P63                                                                                   | BN63B4                                                                                    | 141                                                                                   |
| 0.94                    | 642                  | 2.9 | 960  | 13800    | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 63/130_960                                                                       | P71                                                                                   | BN71A6                                                                                    | 146                                                                                   |
| 0.98                    | 527                  | 1.9 | 1350 | 8000     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 49/110_1350                                                                      | P63                                                                                   | BN63B4                                                                                    | 141                                                                                   |
| 0.98                    | 756                  | 3.6 | 920  | 16000    | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 86/150_920                                                                       | P71                                                                                   | BN71A6                                                                                    | 154                                                                                   |
| 1.2                     | 537                  | 3.4 | 760  | 13800    | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 63/130_760                                                                       | P71                                                                                   | BN71A6                                                                                    | 146                                                                                   |
| 1.2                     | 436                  | 2.3 | 1080 | 8000     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 49/110_1080                                                                      | P63                                                                                   | BN63B4                                                                                    | 141                                                                                   |
| 1.4                     | 479                  | 1.0 | 920  | 7000     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 44/86_920                                                                        | P63                                                                                   | BN63B4                                                                                    | 137                                                                                   |
| 1.7                     | 391                  | 1.4 | 525  | 7000     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 44/86_525                                                                        | P71                                                                                   | BN71A6                                                                                    | 137                                                                                   |
| 1.8                     | 375                  | 2.7 | 720  | 8000     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 49/110_720                                                                       | P63                                                                                   | BN63B4                                                                                    | 141                                                                                   |
| 1.9                     | 356                  | 1.4 | 700  | 7000     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 44/86_700                                                                        | P63                                                                                   | BN63B4                                                                                    | 137                                                                                   |
| 2.3                     | 321                  | 1.2 | 400  | 5750     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 44/75_400                                                                        | P71                                                                                   | BN71A6                                                                                    | 133                                                                                   |
| 2.3                     | 313                  | 1.8 | 400  | 7000     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 44/86_400                                                                        | P71                                                                                   | BN71A6                                                                                    | 137                                                                                   |
| 2.3                     | 344                  | 3.1 | 400  | 8000     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 49/110_400                                                                       | P71                                                                                   | BN71A6                                                                                    | 141                                                                                   |
| 2.4                     | 288                  | 3.5 | 540  | 8000     | —                                                                                   | —                                                                                   | —                                                                                   | VF/W 49/110_540                                                                       | P63                                                                                   | BN63B4                                                                                    | 141                                                                                   |



## 0.18 kW

| n2<br>min-1 | M2<br>Nm | S   | i   | Rn2<br>N |  |  |  |  |  | IEC  |  |          |        |        |     |
|-------------|----------|-----|-----|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------|--------|--------|-----|
| 2.5         | 301      | 1.2 | 525 | 5750     | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/75_525                                                                      | P63                                                                                 | BN63B4                                                                                  | 133                                                                                 |          |        |        |     |
| 2.5         | 287      | 1.7 | 525 | 7000     |                                                                                   |                                                                                   |                                                                                   | VF/W 44/86_525                                                                      | P63                                                                                 | BN63B4                                                                                  | 137                                                                                 |          |        |        |     |
| 3.0         | 258      | 1.2 | 300 | 7000     |                                                                                   |                                                                                   |                                                                                   | WR 86_300                                                                           | P71                                                                                 | BN71A6                                                                                  | 136                                                                                 |          |        |        |     |
| 3.0         | 264      | 1.5 | 300 | 5750     | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/75_300                                                                      | P71                                                                                 | BN71A6                                                                                  | 133                                                                                 |          |        |        |     |
| 3.0         | 275      | 2.1 | 300 | 8000     |                                                                                   |                                                                                   |                                                                                   | WR 110_300                                                                          | P71                                                                                 | BN71A6                                                                                  | 140                                                                                 |          |        |        |     |
| 3.0         | 241      | 2.3 | 300 | 7000     |                                                                                   |                                                                                   |                                                                                   | VF/W 44/86_300                                                                      | P71                                                                                 | BN71A6                                                                                  | 137                                                                                 |          |        |        |     |
| 3.0         | 269      | 3.9 | 300 | 8000     |                                                                                   |                                                                                   |                                                                                   | VF/W 49/110_300                                                                     | P71                                                                                 | BN71A6                                                                                  | 141                                                                                 |          |        |        |     |
| 3.3         | 240      | 1.5 | 400 | 5750     |                                                                                   |                                                                                   |                                                                                   | VF/W 44/75_400                                                                      | P63                                                                                 | BN63B4                                                                                  | 133                                                                                 |          |        |        |     |
| 3.3         | 214      | 2.3 | 400 | 7000     |                                                                                   |                                                                                   |                                                                                   | VF/W 44/86_400                                                                      | P63                                                                                 | BN63B4                                                                                  | 137                                                                                 |          |        |        |     |
| 3.8         | 206      | 1.1 | 240 | 6200     |                                                                                   |                                                                                   |                                                                                   | WR 75_240                                                                           | P71                                                                                 | BN71A6                                                                                  | 132                                                                                 |          |        |        |     |
| 3.8         | 229      | 1.4 | 240 | 7000     | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_240                                                                           | P71                                                                                 | BN71A6                                                                                  | 136                                                                                 |          |        |        |     |
| 3.8         | 243      | 2.4 | 240 | 8000     |                                                                                   |                                                                                   |                                                                                   | WR 110_240                                                                          | P71                                                                                 | BN71A6                                                                                  | 140                                                                                 |          |        |        |     |
| 3.9         | 233      | 2.4 | 230 | 7000     |                                                                                   |                                                                                   |                                                                                   | VF/W 44/86_230                                                                      | P71                                                                                 | BN71A6                                                                                  | 137                                                                                 |          |        |        |     |
| 4.2         | 172      | 1.2 | 315 | 5000     |                                                                                   |                                                                                   |                                                                                   | VF/W 30/63_315                                                                      | P63                                                                                 | BN63B4                                                                                  | 129                                                                                 |          |        |        |     |
| 4.4         | 172      | 1.0 | 300 | 6200     |                                                                                   |                                                                                   |                                                                                   | WR 75_300                                                                           | P63                                                                                 | BN63B4                                                                                  | 132                                                                                 |          |        |        |     |
| 4.4         | 191      | 1.4 | 300 | 7000     |                                                                                   |                                                                                   |                                                                                   | WR 86_300                                                                           | P63                                                                                 | BN63B4                                                                                  | 136                                                                                 |          |        |        |     |
| 4.4         | 199      | 1.9 | 300 | 5750     |                                                                                   |                                                                                   |                                                                                   | VF/W 44/75_300                                                                      | P63                                                                                 | BN63B4                                                                                  | 133                                                                                 |          |        |        |     |
| 4.4         | 176      | 2.8 | 300 | 7000     | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_300                                                                      | P63                                                                                 | BN63B4                                                                                  | 137                                                                                 |          |        |        |     |
| 4.7         | 202      | 1.9 | 192 | 7000     |                                                                                   |                                                                                   |                                                                                   | WR 86_192                                                                           | P71                                                                                 | BN71A6                                                                                  | 136                                                                                 |          |        |        |     |
| 5.0         | 175      | 1.6 | 180 | 6200     |                                                                                   |                                                                                   |                                                                                   | WR 75_180                                                                           | P71                                                                                 | BN71A6                                                                                  | 132                                                                                 |          |        |        |     |
| 5.3         | 186      | 2.0 | 250 | 5750     |                                                                                   |                                                                                   |                                                                                   | VF/W 44/75_250                                                                      | P63                                                                                 | BN63B4                                                                                  | 133                                                                                 |          |        |        |     |
| 5.4         | 183      | 2.1 | 168 | 7000     |                                                                                   |                                                                                   |                                                                                   | WR 86_168                                                                           | P71                                                                                 | BN71A6                                                                                  | 136                                                                                 |          |        |        |     |
| 5.5         | 144      | 0.9 | 240 | 5000     |                                                                                   |                                                                                   |                                                                                   | WR 63_240                                                                           | P63                                                                                 | BN63B4                                                                                  | 128                                                                                 |          |        |        |     |
| 5.5         | 153      | 1.4 | 240 | 6200     |                                                                                   |                                                                                   |                                                                                   | —                                                                                   | —                                                                                   | —                                                                                       | WR 75_240                                                                           | P63      | BN63B4 | 132    |     |
| 5.5         | 147      | 1.4 | 240 | 5000     | VF/W 30/63_240                                                                    | P63                                                                               | BN63B4                                                                            |                                                                                     |                                                                                     |                                                                                         | 129                                                                                 |          |        |        |     |
| 5.5         | 166      | 1.8 | 240 | 7000     | WR 86_240                                                                         | P63                                                                               | BN63B4                                                                            |                                                                                     |                                                                                     |                                                                                         | 136                                                                                 |          |        |        |     |
| 5.7         | 162      | 3.1 | 230 | 7000     | VF/W 44/86_230                                                                    | P63                                                                               | BN63B4                                                                            |                                                                                     |                                                                                     |                                                                                         | 137                                                                                 |          |        |        |     |
| 6.0         | 158      | 2.0 | 150 | 6200     | WR 75_150                                                                         | P71                                                                               | BN71A6                                                                            |                                                                                     |                                                                                     |                                                                                         | 132                                                                                 |          |        |        |     |
| 6.5         | 161      | 2.7 | 138 | 7000     | —                                                                                 | —                                                                                 | —                                                                                 |                                                                                     |                                                                                     |                                                                                         | WR 86_138                                                                           | P71      | BN71A6 | 136    |     |
| 6.9         | 128      | 1.2 | 192 | 5000     |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                         | WR 63_192                                                                           | P63      | BN63B4 | 128    |     |
| 6.9         | 145      | 2.3 | 192 | 7000     |                                                                                   |                                                                                   |                                                                                   | WR 86_192                                                                           | P63                                                                                 | BN63B4                                                                                  | 136                                                                                 |          |        |        |     |
| 7.3         | 129      | 1.8 | 180 | 6200     |                                                                                   |                                                                                   |                                                                                   | WR 75_180                                                                           | P63                                                                                 | BN63B4                                                                                  | 132                                                                                 |          |        |        |     |
| 7.5         | 138      | 2.4 | 120 | 6200     |                                                                                   |                                                                                   |                                                                                   | WR 75_120                                                                           | P71                                                                                 | BN71A6                                                                                  | 132                                                                                 |          |        |        |     |
| 7.9         | 131      | 2.7 | 168 | 7000     |                                                                                   |                                                                                   |                                                                                   | —                                                                                   | —                                                                                   | —                                                                                       | WR 86_168                                                                           | P63      | BN63B4 | 136    |     |
| 7.9         | 126      | 1.6 | 114 | 5000     |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                         | WR 63_114                                                                           | P71      | BN71A6 | 128    |     |
| 8.8         | 113      | 2.3 | 150 | 6200     | WR 75_150                                                                         | P63                                                                               | BN63B4                                                                            |                                                                                     |                                                                                     |                                                                                         | 132                                                                                 |          |        |        |     |
| 9.0         | 88       | 1.4 | 100 | 5000     | W 63_100                                                                          | S1                                                                                | M1SC6                                                                             |                                                                                     |                                                                                     |                                                                                         | 126                                                                                 | W 63_100 | P71    | BN71A6 | 127 |
| 9.0         | 96       | 1.7 | 100 | 6200     | W 75_100                                                                          | S1                                                                                | M1SC6                                                                             |                                                                                     |                                                                                     |                                                                                         | 130                                                                                 | W 75_100 | P71    | BN71A6 | 131 |
| 9.0         | 105      | 2.4 | 100 | 7000     | W 86_100                                                                          | S1                                                                                | M1SC6                                                                             |                                                                                     |                                                                                     |                                                                                         | 134                                                                                 | W 86_100 | P71    | BN71A6 | 135 |
| 9.8         | 102      | 1.7 | 135 | 5000     | —                                                                                 | —                                                                                 | —                                                                                 |                                                                                     |                                                                                     |                                                                                         | WR 63_135                                                                           | P63      | BN63B4 | 128    |     |
| 10.0        | 107      | 1.9 | 90  | 5000     |                                                                                   |                                                                                   |                                                                                   | WR 63_90                                                                            | P71                                                                                 | BN71A6                                                                                  | 128                                                                                 |          |        |        |     |
| 11.0        | 98       | 3.1 | 120 | 6200     |                                                                                   |                                                                                   |                                                                                   | WR 75_120                                                                           | P63                                                                                 | BN63B4                                                                                  | 132                                                                                 |          |        |        |     |
| 11.3        | 79       | 1.6 | 80  | 5000     |                                                                                   |                                                                                   |                                                                                   | W 63_80                                                                             | S1                                                                                  | M1SC6                                                                                   | 126                                                                                 | W 63_80  | P71    | BN71A6 | 127 |
| 11.3        | 83       | 2.4 | 80  | 6200     |                                                                                   |                                                                                   |                                                                                   | W 75_80                                                                             | S1                                                                                  | M1SC6                                                                                   | 130                                                                                 | W 75_80  | P71    | BN71A6 | 131 |
| 11.3        | 90       | 3.1 | 80  | 7000     |                                                                                   |                                                                                   |                                                                                   | W 86_80                                                                             | S1                                                                                  | M1SC6                                                                                   | 134                                                                                 | W 86_80  | P71    | BN71A6 | 135 |
| 11.6        | 91       | 2.0 | 114 | 5000     |                                                                                   |                                                                                   |                                                                                   | —                                                                                   | —                                                                                   | —                                                                                       | WR 63_114                                                                           | P63      | BN63B4 | 128    |     |
| 12.0        | 100      | 3.3 | 75  | 6200     | WR 75_75                                                                          | P71                                                                               | BN71A6                                                                            |                                                                                     |                                                                                     |                                                                                         | 132                                                                                 |          |        |        |     |
| 12.2        | 82       | 1.0 | 108 | 3450     | VFR 49_108                                                                        | P63                                                                               | BN63B4                                                                            |                                                                                     |                                                                                     |                                                                                         | 122                                                                                 |          |        |        |     |
| 14.7        | 75       | 2.5 | 90  | 5000     | —                                                                                 | —                                                                                 | —                                                                                 |                                                                                     |                                                                                     |                                                                                         | WR 63_90                                                                            | P63      | BN63B4 | 128    |     |
| 15.0        | 61       | 1.1 | 60  | 3000     |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                         | VF 49_60                                                                            | P71      | BN71A6 | 120    |     |
| 15.0        | 60       | 1.1 | 180 | 3300     |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                         | VFR 49_180                                                                          | P63      | BN63A2 | 122    |     |
| 15.7        | 68       | 1.3 | 84  | 3420     |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                         | VFR 49_84                                                                           | P63      | BN63B4 | 122    |     |
| 16.5        | 54       | 1.0 | 80  | 3150     |                                                                                   |                                                                                   |                                                                                   | VF 49_80                                                                            | P63                                                                                 | BN63B4                                                                                  | 120                                                                                 |          |        |        |     |
| 18.3        | 63       | 1.2 | 72  | 3270     |                                                                                   |                                                                                   |                                                                                   | —                                                                                   | —                                                                                   | —                                                                                       | VFR 49_72                                                                           | P63      | BN63B4 | 122    |     |
| 18.3        | 66       | 2.8 | 72  | 5000     |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                         | WR 63_72                                                                            | P63      | BN63B4 | 128    |     |
| 18.9        | 49       | 1.1 | 70  | 3150     | VF 49_70                                                                          | P63                                                                               | BN63B4                                                                            |                                                                                     |                                                                                     |                                                                                         | 120                                                                                 |          |        |        |     |
| 20.0        | 50       | 1.4 | 135 | 3280     | VFR 49_135                                                                        | P63                                                                               | BN63A2                                                                            |                                                                                     |                                                                                     |                                                                                         | 122                                                                                 |          |        |        |     |
| 20.0        | 54       | 2.9 | 45  | 5000     | W 63_45                                                                           | S1                                                                                | M1SC6                                                                             |                                                                                     |                                                                                     |                                                                                         | 126                                                                                 | W 63_45  | P71    | BN71A6 | 127 |
| 22.0        | 45       | 0.9 | 60  | 2300     | —                                                                                 | —                                                                                 | —                                                                                 |                                                                                     |                                                                                     |                                                                                         | VF 44_60                                                                            | P63      | BN63B4 | 114    |     |
| 22.0        | 45       | 1.3 | 60  | 3150     |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                         | VF 49_60                                                                            | P63      | BN63B4 | 120    |     |
| 23.2        | 54       | 3.3 | 57  | 4910     |                                                                                   |                                                                                   |                                                                                   | WR 63_57                                                                            | P63                                                                                 | BN63B4                                                                                  | 128                                                                                 |          |        |        |     |
| 24.4        | 50       | 1.5 | 54  | 3010     |                                                                                   |                                                                                   |                                                                                   | VFR 49_54                                                                           | P63                                                                                 | BN63B4                                                                                  | 122                                                                                 |          |        |        |     |
| 28.7        | 38       | 1.0 | 46  | 2500     |                                                                                   |                                                                                   |                                                                                   | VF 44_46                                                                            | P63                                                                                 | BN63B4                                                                                  | 114                                                                                 |          |        |        |     |
| 29.3        | 37       | 1.8 | 45  | 2300     |                                                                                   |                                                                                   |                                                                                   | —                                                                                   | —                                                                                   | —                                                                                       | VF 49_45                                                                            | P63      | BN63B4 | 120    |     |
| 31          | 40       | 1.9 | 42  | 2810     |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                         | VFR 49_42                                                                           | P63      | BN63B4 | 122    |     |
| 32          | 36       | 1.4 | 28  | 2290     | VF 44_28                                                                          | P71                                                                               | BN71A6                                                                            |                                                                                     |                                                                                     |                                                                                         | 114                                                                                 |          |        |        |     |
| 37          | 31       | 2.2 | 36  | 2760     | VF 49_36                                                                          | P63                                                                               | BN63B4                                                                            |                                                                                     |                                                                                     |                                                                                         | 120                                                                                 |          |        |        |     |
| 38          | 31       | 1.3 | 35  | 2430     | VF 44_35                                                                          | P63                                                                               | BN63B4                                                                            |                                                                                     |                                                                                     |                                                                                         | 114                                                                                 |          |        |        |     |
| 47          | 26       | 1.5 | 28  | 2270     | —                                                                                 | —                                                                                 | —                                                                                 |                                                                                     |                                                                                     |                                                                                         | VF 44_28                                                                            | P63      | BN63B4 | 114    |     |

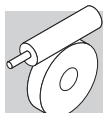


## 0.18 kW

| n2<br>min-1 | M2<br>Nm | S   | i  | Rn2<br>N |  |  |  |  |  | IEC  |  |
|-------------|----------|-----|----|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 47          | 26       | 2.9 | 28 | 2560     | —                                                                                 |                                                                                   |                                                                                   | VF 49_28                                                                          | P63                                                                                | BN63B4                                                                                  | 120                                                                                 |
| 55          | 23       | 2.7 | 24 | 2430     | —                                                                                 |                                                                                   |                                                                                   | VF 49_24                                                                          | P63                                                                                | BN63B4                                                                                  | 120                                                                                 |
| 66          | 19       | 0.9 | 20 | 1040     | —                                                                                 |                                                                                   |                                                                                   | VF 30_20                                                                          | P63                                                                                | BN63B4                                                                                  | 112                                                                                 |
| 66          | 20       | 1.9 | 20 | 2040     | —                                                                                 |                                                                                   |                                                                                   | VF 44_20                                                                          | P63                                                                                | BN63B4                                                                                  | 114                                                                                 |
| 73          | 18       | 3.2 | 18 | 2230     | —                                                                                 |                                                                                   |                                                                                   | VF 49_18                                                                          | P63                                                                                | BN63B4                                                                                  | 120                                                                                 |
| 77          | 16       | 1.8 | 35 | 1970     | —                                                                                 |                                                                                   |                                                                                   | VF 44_35                                                                          | P63                                                                                | BN63A2                                                                                  | 114                                                                                 |
| 88          | 15       | 1.2 | 15 | 960      | —                                                                                 |                                                                                   |                                                                                   | VF 30_15                                                                          | P63                                                                                | BN63B4                                                                                  | 112                                                                                 |
| 94          | 15       | 2.0 | 14 | 1830     | —                                                                                 |                                                                                   |                                                                                   | VF 44_14                                                                          | P63                                                                                | BN63B4                                                                                  | 114                                                                                 |
| 132         | 11       | 1.5 | 10 | 860      | —                                                                                 |                                                                                   |                                                                                   | VF 30_10                                                                          | P63                                                                                | BN63B4                                                                                  | 112                                                                                 |
| 132         | 11       | 2.7 | 10 | 1640     | —                                                                                 |                                                                                   |                                                                                   | VF 44_10                                                                          | P63                                                                                | BN63B4                                                                                  | 114                                                                                 |
| 189         | 8        | 2.1 | 7  | 770      | —                                                                                 |                                                                                   |                                                                                   | VF 30_7                                                                           | P63                                                                                | BN63B4                                                                                  | 112                                                                                 |
| 193         | 7        | 2.9 | 14 | 1470     | —                                                                                 |                                                                                   |                                                                                   | VF 44_14                                                                          | P63                                                                                | BN63A2                                                                                  | 114                                                                                 |
| 270         | 5        | 2.2 | 10 | 710      | —                                                                                 |                                                                                   |                                                                                   | VF 30_10                                                                          | P63                                                                                | BN63A2                                                                                  | 112                                                                                 |
| 386         | 4        | 3.1 | 7  | 640      | —                                                                                 |                                                                                   |                                                                                   | VF 30_7                                                                           | P63                                                                                | BN63A2                                                                                  | 112                                                                                 |

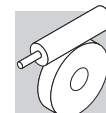
## 0.25 kW

| n2<br>min-1 | M2<br>Nm | S   | i    | Rn2<br>N |  |  |  |  |  |  |  |  |
|-------------|----------|-----|------|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 0.28        | 1358     | 1.4 | 3200 | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_3200                                                                  | P71                                                                                 | BN71B6                                                                              |                                                                                     | 146                                                                                 |
| 0.28        | 1868     | 2.4 | 3200 | 19500    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/185_3200                                                                  | P71                                                                                 | BN71B6                                                                              |                                                                                     | 162                                                                                 |
| 0.31        | 1952     | 1.4 | 2944 | 16000    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/150_2944                                                                  | P71                                                                                 | BN71B6                                                                              |                                                                                     | 154                                                                                 |
| 0.43        | 945      | 1.9 | 3200 | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_3200                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 146                                                                                 |
| 0.43        | 1334     | 3.1 | 3200 | 19500    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/185_3200                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 162                                                                                 |
| 0.47        | 1380     | 1.9 | 2944 | 16000    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/150_2944                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 154                                                                                 |
| 0.49        | 1562     | 2.8 | 1840 | 19500    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/185_1840                                                                  | P71                                                                                 | BN71B6                                                                              |                                                                                     | 162                                                                                 |
| 0.54        | 1022     | 1.8 | 2560 | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_2560                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 146                                                                                 |
| 0.54        | 1289     | 3.3 | 2560 | 19500    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/185_2560                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 162                                                                                 |
| 0.65        | 1464     | 1.8 | 1380 | 16000    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/150_1380                                                                  | P71                                                                                 | BN71B6                                                                              |                                                                                     | 154                                                                                 |
| 0.66        | 1006     | 1.0 | 2070 | 8000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 49/110_2070                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 141                                                                                 |
| 0.75        | 1214     | 2.1 | 1840 | 16000    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/150_1840                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 154                                                                                 |
| 0.75        | 1019     | 1.8 | 1200 | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_1200                                                                  | P71                                                                                 | BN71B6                                                                              |                                                                                     | 146                                                                                 |
| 0.76        | 875      | 2.1 | 1800 | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_1800                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 146                                                                                 |
| 0.83        | 863      | 1.2 | 1656 | 8000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 49/110_1656                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 141                                                                                 |
| 0.90        | 845      | 2.1 | 1520 | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_1520                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 146                                                                                 |
| 0.98        | 1049     | 2.6 | 920  | 16000    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/150_920                                                                   | P71                                                                                 | BN71B6                                                                              |                                                                                     | 154                                                                                 |
| 1.0         | 1006     | 2.6 | 1380 | 16000    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/150_1380                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 154                                                                                 |
| 1.0         | 703      | 1.4 | 1350 | 8000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 49/110_1350                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 141                                                                                 |
| 1.1         | 708      | 2.5 | 1200 | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_1200                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 146                                                                                 |
| 1.2         | 746      | 2.5 | 760  | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_760                                                                   | P71                                                                                 | BN71B6                                                                              |                                                                                     | 146                                                                                 |
| 1.3         | 581      | 1.7 | 1080 | 8000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 49/110_1080                                                                  | P71                                                                                 | BN71A4                                                                              |                                                                                     | 141                                                                                 |
| 1.3         | 860      | 3.1 | 690  | 16000    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/150_690                                                                   | P71                                                                                 | BN71B6                                                                              |                                                                                     | 154                                                                                 |
| 1.4         | 617      | 2.9 | 960  | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_960                                                                   | P71                                                                                 | BN71A4                                                                              |                                                                                     | 146                                                                                 |
| 1.7         | 544      | 1.9 | 540  | 8000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 49/110_540                                                                   | P71                                                                                 | BN71B6                                                                              |                                                                                     | 141                                                                                 |
| 1.7         | 543      | 1.0 | 525  | 7000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 44/86_525                                                                    | P71                                                                                 | BN71B6                                                                              |                                                                                     | 137                                                                                 |
| 1.8         | 515      | 3.5 | 760  | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_760                                                                   | P71                                                                                 | BN71A4                                                                              |                                                                                     | 146                                                                                 |
| 1.9         | 500      | 2.0 | 720  | 8000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 49/110_720                                                                   | P71                                                                                 | BN71A4                                                                              |                                                                                     | 141                                                                                 |
| 2.0         | 474      | 1.1 | 700  | 7000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 44/86_700                                                                    | P71                                                                                 | BN71A4                                                                              |                                                                                     | 137                                                                                 |
| 2.5         | 384      | 2.6 | 540  | 8000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 49/110_540                                                                   | P71                                                                                 | BN71A4                                                                              |                                                                                     | 141                                                                                 |
| 2.6         | 383      | 1.3 | 525  | 7000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 44/86_525                                                                    | P71                                                                                 | BN71A4                                                                              |                                                                                     | 137                                                                                 |
| 3.0         | 366      | 1.1 | 300  | 5750     | —                                                                                 |                                                                                   |                                                                                   | VF/W 44/75_300                                                                    | P71                                                                                 | BN71B6                                                                              |                                                                                     | 133                                                                                 |
| 3.0         | 382      | 1.5 | 300  | 8000     | —                                                                                 |                                                                                   |                                                                                   | WR 110_300                                                                        | P71                                                                                 | BN71B6                                                                              |                                                                                     | 140                                                                                 |
| 3.0         | 374      | 2.8 | 300  | 8000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 49/110_300                                                                   | P71                                                                                 | BN71B6                                                                              |                                                                                     | 141                                                                                 |
| 3.4         | 319      | 1.2 | 400  | 5750     | —                                                                                 |                                                                                   |                                                                                   | VF/W 44/75_400                                                                    | P71                                                                                 | BN71A4                                                                              |                                                                                     | 133                                                                                 |
| 3.4         | 285      | 1.8 | 400  | 7000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 44/86_400                                                                    | P71                                                                                 | BN71A4                                                                              |                                                                                     | 137                                                                                 |
| 3.4         | 313      | 3.2 | 400  | 8000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 49/110_400                                                                   | P71                                                                                 | BN71A4                                                                              |                                                                                     | 141                                                                                 |
| 3.8         | 318      | 1.0 | 240  | 7000     | —                                                                                 |                                                                                   |                                                                                   | WR 86_240                                                                         | P71                                                                                 | BN71B6                                                                              |                                                                                     | 136                                                                                 |
| 3.8         | 337      | 1.7 | 240  | 8000     | —                                                                                 |                                                                                   |                                                                                   | WR 110_240                                                                        | P71                                                                                 | BN71B6                                                                              |                                                                                     | 140                                                                                 |
| 3.9         | 323      | 1.7 | 230  | 7000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 44/86_230                                                                    | P71                                                                                 | BN71B6                                                                              |                                                                                     | 137                                                                                 |
| 3.9         | 311      | 3.4 | 230  | 8000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 49/110_230                                                                   | P71                                                                                 | BN71B6                                                                              |                                                                                     | 141                                                                                 |
| 4.6         | 255      | 1.1 | 300  | 7000     | —                                                                                 |                                                                                   |                                                                                   | WR 86_300                                                                         | P71                                                                                 | BN71A4                                                                              |                                                                                     | 136                                                                                 |
| 4.6         | 266      | 1.4 | 300  | 5750     | —                                                                                 |                                                                                   |                                                                                   | VF/W 44/75_300                                                                    | P71                                                                                 | BN71A4                                                                              |                                                                                     | 133                                                                                 |
| 4.6         | 266      | 2.1 | 300  | 8000     | —                                                                                 |                                                                                   |                                                                                   | WR 110_300                                                                        | P71                                                                                 | BN71A4                                                                              |                                                                                     | 140                                                                                 |
| 4.6         | 234      | 2.1 | 300  | 7000     | —                                                                                 |                                                                                   |                                                                                   | VF/W 44/86_300                                                                    | P71                                                                                 | BN71A4                                                                              |                                                                                     | 137                                                                                 |
| 4.7         | 280      | 1.4 | 192  | 7000     | —                                                                                 |                                                                                   |                                                                                   | WR 86_192                                                                         | P71                                                                                 | BN71B6                                                                              |                                                                                     | 136                                                                                 |



## 0.25 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i   | Rn <sub>2</sub><br>N |          |    |                |     | IEC    |        |
|-------------------------|----------------------|-----|-----|----------------------|----------|----|----------------|-----|--------|--------|
| 5.5                     | 247                  | 1.5 | 250 | 5750                 | —        | —  | VF/W 44/75_250 | P71 | BN71A4 | 133    |
| 5.7                     | 204                  | 1.1 | 240 | 6200                 | —        | —  | WR 75_240      | P71 | BN71A4 | 132    |
| 5.7                     | 221                  | 1.4 | 240 | 7000                 | —        | —  | WR 86_240      | P71 | BN71A4 | 136    |
| 5.7                     | 233                  | 2.4 | 240 | 8000                 | —        | —  | WR 110_240     | P71 | BN71A4 | 140    |
| 6.0                     | 216                  | 2.3 | 230 | 7000                 | —        | —  | VF/W 44/86_230 | P71 | BN71A4 | 137    |
| 6.0                     | 219                  | 1.4 | 150 | 6200                 | —        | —  | WR 75_150      | P71 | BN71B6 | 132    |
| 6.7                     | 193                  | 0.9 | 135 | 5000                 | —        | —  | WR 63_135      | P71 | BN71B6 | 128    |
| 7.2                     | 193                  | 1.7 | 192 | 7000                 | —        | —  | WR 86_192      | P71 | BN71A4 | 136    |
| 7.2                     | 200                  | 3.1 | 192 | 8000                 | —        | —  | WR 110_192     | P71 | BN71A4 | 140    |
| 7.6                     | 172                  | 1.4 | 180 | 6200                 | —        | —  | WR 75_180      | P71 | BN71A4 | 132    |
| 7.9                     | 175                  | 1.1 | 114 | 5000                 | —        | —  | WR 63_114      | P71 | BN71B6 | 128    |
| 8.2                     | 175                  | 2.0 | 168 | 7000                 | —        | —  | WR 86_168      | P71 | BN71A4 | 136    |
| 9.0                     | 122                  | 1.0 | 100 | 5000                 | W 63_100 | S1 | M1SD6          | 126 | —      | —      |
| 9.0                     | 133                  | 1.2 | 100 | 6200                 | W 75_100 | S1 | M1SD6          | 130 | P71    | BN71B6 |
| 9.0                     | 146                  | 1.7 | 100 | 7000                 | W 86_100 | S1 | M1SD6          | 134 | P71    | BN71B6 |
| 9.2                     | 151                  | 1.7 | 150 | 6200                 | —        | —  | WR 75_150      | P71 | BN71A4 | 132    |
| 10.0                    | 151                  | 2.7 | 138 | 7000                 | —        | —  | WR 86_138      | P71 | BN71A4 | 136    |
| 10.0                    | 160                  | 2.3 | 90  | 6200                 | —        | —  | WR 75_90       | P71 | BN71B6 | 132    |
| 10.2                    | 136                  | 1.3 | 135 | 5000                 | —        | —  | WR 63_135      | P71 | BN71A4 | 128    |
| 11.3                    | 110                  | 1.1 | 80  | 5000                 | W 63_80  | S1 | M1SD6          | 126 | —      | —      |
| 11.3                    | 115                  | 1.7 | 80  | 6200                 | W 75_80  | S1 | M1SD6          | 130 | P71    | BN71B6 |
| 11.3                    | 125                  | 2.2 | 80  | 7000                 | W 86_80  | S1 | M1SD6          | 134 | P71    | BN71B6 |
| 11.5                    | 131                  | 2.3 | 120 | 6200                 | —        | —  | WR 75_120      | P71 | BN71A4 | 132    |
| 11.5                    | 138                  | 2.8 | 120 | 7000                 | —        | —  | WR 86_120      | P71 | BN71A4 | 136    |
| 12.1                    | 121                  | 1.5 | 114 | 5000                 | —        | —  | WR 63_114      | P71 | BN71A4 | 128    |
| 13.8                    | 89                   | 1.3 | 100 | 5000                 | —        | —  | W 63_100       | P71 | BN71A4 | 126    |
| 13.8                    | 96                   | 1.6 | 100 | 6200                 | —        | —  | W 75_100       | P71 | BN71A4 | 130    |
| 13.8                    | 102                  | 2.2 | 100 | 7000                 | —        | —  | W 86_100       | P71 | BN71A4 | 134    |
| 15.3                    | 100                  | 1.9 | 90  | 5000                 | —        | —  | WR 63_90       | P71 | BN71A4 | 128    |
| 15.3                    | 108                  | 3.0 | 90  | 6200                 | —        | —  | WR 75_90       | P71 | BN71A4 | 132    |
| 17.2                    | 78                   | 1.5 | 80  | 5000                 | —        | —  | W 63_80        | P71 | BN71A4 | 126    |
| 17.2                    | 82                   | 2.2 | 80  | 6200                 | —        | —  | W 75_80        | P71 | BN71A4 | 130    |
| 17.2                    | 89                   | 2.9 | 80  | 7000                 | —        | —  | W 86_80        | P71 | BN71A4 | 134    |
| 18.3                    | 95                   | 3.1 | 75  | 6200                 | —        | —  | WR 75_75       | P71 | BN71A4 | 132    |
| 19.1                    | 88                   | 2.1 | 72  | 5000                 | —        | —  | WR 63_72       | P71 | BN71A4 | 128    |
| 20.0                    | 70                   | 1.0 | 45  | 3150                 | —        | —  | —              | —   | —      | —      |
| 21.5                    | 68                   | 1.8 | 64  | 5000                 | —        | —  | W 63_64        | P71 | BN71A4 | 126    |
| 22.0                    | 63                   | 0.9 | 60  | 3150                 | —        | —  | —              | —   | —      | —      |
| 22.9                    | 68                   | 3.0 | 60  | 6200                 | —        | —  | W 75_60        | P71 | BN71A4 | 130    |
| 24.1                    | 72                   | 2.5 | 57  | 4780                 | —        | —  | WR 63_57       | P71 | BN71A4 | 128    |
| 29.3                    | 51                   | 1.3 | 45  | 2850                 | —        | —  | —              | —   | —      | —      |
| 31                      | 52                   | 2.8 | 45  | 4550                 | —        | —  | W 63_45        | P71 | BN71A4 | 126    |
| 31                      | 59                   | 3.0 | 45  | 4460                 | —        | —  | WR 63_45       | P71 | BN71A4 | 128    |
| 32                      | 50                   | 1.0 | 28  | 2300                 | —        | —  | VF 44_28       | P71 | BN71B6 | 114    |
| 36                      | 46                   | 3.4 | 38  | 4320                 | —        | —  | W 63_38        | P71 | BN71A4 | 126    |
| 37                      | 44                   | 1.6 | 36  | 2670                 | —        | —  | VF 49_36       | P71 | BN71A4 | 120    |
| 38                      | 43                   | 0.9 | 35  | 2300                 | —        | —  | VF 44_35       | P71 | BN71A4 | 114    |
| 38                      | 49                   | 3.3 | 36  | 4160                 | —        | —  | WR 63_36       | P71 | BN71A4 | 128    |
| 45                      | 39                   | 1.1 | 20  | 2190                 | —        | —  | VF 44_20       | P71 | BN71B6 | 114    |
| 47                      | 36                   | 1.1 | 28  | 2190                 | —        | —  | VF 44_28       | P71 | BN71A4 | 114    |
| 47                      | 36                   | 2.1 | 28  | 2480                 | —        | —  | VF 49_28       | P71 | BN71A4 | 120    |
| 55                      | 33                   | 1.9 | 24  | 2360                 | —        | —  | VF 49_24       | P71 | BN71A4 | 120    |
| 64                      | 29                   | 1.3 | 14  | 1980                 | —        | —  | VF 44_14       | P71 | BN71B6 | 114    |
| 64                      | 29                   | 2.5 | 14  | 2260                 | —        | —  | VF 49_14       | P71 | BN71B6 | 120    |
| 66                      | 28                   | 1.4 | 20  | 1970                 | —        | —  | VF 44_20       | P71 | BN71A4 | 114    |
| 73                      | 25                   | 2.3 | 18  | 2170                 | —        | —  | VF 49_18       | P71 | BN71A4 | 120    |
| 77                      | 23                   | 1.3 | 35  | 1930                 | —        | —  | VF 44_35       | P63 | BN63B2 | 114    |
| 90                      | 22                   | 1.8 | 10  | 1780                 | —        | —  | VF 44_10       | P71 | BN71B6 | 114    |
| 90                      | 22                   | 2.9 | 10  | 2040                 | —        | —  | VF 49_10       | P71 | BN71B6 | 120    |
| 94                      | 21                   | 1.4 | 14  | 1770                 | —        | —  | VF 44_14       | P71 | BN71A4 | 114    |
| 94                      | 21                   | 3.2 | 14  | 2010                 | —        | —  | VF 49_14       | P71 | BN71A4 | 120    |
| 113                     | 17                   | 2.8 | 24  | 1930                 | —        | —  | VF 49_24       | P63 | BN63B2 | 120    |
| 129                     | 16                   | 2.5 | 7   | 1590                 | —        | —  | VF 44_7        | P71 | BN71B6 | 114    |
| 132                     | 15                   | 1.9 | 10  | 1590                 | —        | —  | VF 44_10       | P71 | BN71A4 | 114    |
| 135                     | 14                   | 1.0 | 20  | 840                  | —        | —  | VF 30_20       | P63 | BN63B2 | 112    |
| 180                     | 11                   | 1.3 | 15  | 780                  | —        | —  | VF 30_15       | P63 | BN63B2 | 112    |
| 189                     | 11                   | 2.7 | 7   | 1420                 | —        | —  | VF 44_7        | P71 | BN71A4 | 114    |
| 270                     | 8                    | 1.6 | 10  | 690                  | —        | —  | VF 30_10       | P63 | BN63B2 | 112    |

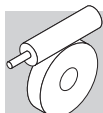


## 0.25 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 270                                 | 8                    | 2.9 | 10 | 1300                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_10                                                                            | P63                                                                                 | BN63B2                                                                                  | 114                                                                                 |
| 386                                 | 5                    | 2.2 | 7  | 620                  | —                                                                                 | —                                                                                 | —                                                                                 | VF 30_7                                                                             | P63                                                                                 | BN63B2                                                                                  | 112                                                                                 |

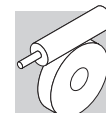
## 0.37 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i    | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|------|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 0.28                                | 2734                 | 1.6 | 3200 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_3200                                                                    | P80                                                                                 | BN80A6                                                                                  | 162                                                                                 |
| 0.31                                | 2858                 | 0.9 | 2944 | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_2944                                                                    | P80                                                                                 | BN80A6                                                                                  | 154                                                                                 |
| 0.36                                | 2684                 | 1.6 | 2560 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_2560                                                                    | P80                                                                                 | BN80A6                                                                                  | 162                                                                                 |
| 0.43                                | 1403                 | 1.3 | 3200 | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_3200                                                                    | P71                                                                                 | BN71B4                                                                                  | 146                                                                                 |
| 0.43                                | 1981                 | 2.1 | 3200 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_3200                                                                    | P71                                                                                 | BN71B4                                                                                  | 162                                                                                 |
| 0.47                                | 2050                 | 1.3 | 2944 | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_2944                                                                    | P71                                                                                 | BN71B4                                                                                  | 154                                                                                 |
| 0.54                                | 1519                 | 1.2 | 2560 | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_2560                                                                    | P71                                                                                 | BN71B4                                                                                  | 146                                                                                 |
| 0.54                                | 1915                 | 2.2 | 2560 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_2560                                                                    | P71                                                                                 | BN71B4                                                                                  | 162                                                                                 |
| 0.60                                | 1771                 | 1.0 | 1520 | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_1520                                                                    | P80                                                                                 | BN80A6                                                                                  | 146                                                                                 |
| 0.66                                | 2143                 | 1.3 | 1380 | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_1380                                                                    | P80                                                                                 | BN80A6                                                                                  | 154                                                                                 |
| 0.74                                | 1803                 | 1.4 | 1840 | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_1840                                                                    | P71                                                                                 | BN71B4                                                                                  | 154                                                                                 |
| 0.74                                | 1614                 | 2.6 | 1840 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_1840                                                                    | P71                                                                                 | BN71B4                                                                                  | 162                                                                                 |
| 0.76                                | 1300                 | 1.4 | 1800 | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_1800                                                                    | P71                                                                                 | BN71B4                                                                                  | 146                                                                                 |
| 0.86                                | 1444                 | 2.9 | 1600 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_1600                                                                    | P71                                                                                 | BN71B4                                                                                  | 162                                                                                 |
| 0.90                                | 1255                 | 1.4 | 1520 | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_1520                                                                    | P71                                                                                 | BN71B4                                                                                  | 146                                                                                 |
| 0.99                                | 1357                 | 3.2 | 920  | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_920                                                                     | P80                                                                                 | BN80A6                                                                                  | 162                                                                                 |
| 0.99                                | 1495                 | 1.7 | 1380 | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_1380                                                                    | P71                                                                                 | BN71B4                                                                                  | 154                                                                                 |
| 1.0                                 | 1045                 | 1.0 | 1350 | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_1350                                                                    | P71                                                                                 | BN71B4                                                                                  | 141                                                                                 |
| 1.1                                 | 1052                 | 1.7 | 1200 | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_1200                                                                    | P71                                                                                 | BN71B4                                                                                  | 146                                                                                 |
| 1.3                                 | 864                  | 1.2 | 1080 | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_1080                                                                    | P71                                                                                 | BN71B4                                                                                  | 141                                                                                 |
| 1.3                                 | 1259                 | 2.1 | 690  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_690                                                                     | P80                                                                                 | BN80A6                                                                                  | 154                                                                                 |
| 1.4                                 | 916                  | 2.0 | 960  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_960                                                                     | P71                                                                                 | BN71B4                                                                                  | 146                                                                                 |
| 1.5                                 | 1068                 | 2.4 | 920  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_920                                                                     | P71                                                                                 | BN71B4                                                                                  | 154                                                                                 |
| 1.7                                 | 797                  | 1.3 | 540  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_540                                                                     | P80                                                                                 | BN80A6                                                                                  | 141                                                                                 |
| 1.7                                 | 1068                 | 2.5 | 529  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_529                                                                     | P80                                                                                 | BN80A6                                                                                  | 154                                                                                 |
| 1.8                                 | 764                  | 2.4 | 760  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_760                                                                     | P71                                                                                 | BN71B4                                                                                  | 146                                                                                 |
| 1.9                                 | 743                  | 1.3 | 720  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_720                                                                     | P71                                                                                 | BN71B4                                                                                  | 141                                                                                 |
| 2.0                                 | 890                  | 2.9 | 690  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_690                                                                     | P71                                                                                 | BN71B4                                                                                  | 154                                                                                 |
| 2.3                                 | 619                  | 2.9 | 600  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_600                                                                     | P71                                                                                 | BN71B4                                                                                  | 146                                                                                 |
| 2.5                                 | 571                  | 1.8 | 540  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_540                                                                     | P71                                                                                 | BN71B4                                                                                  | 141                                                                                 |
| 2.6                                 | 750                  | 3.5 | 529  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_529                                                                     | P71                                                                                 | BN71B4                                                                                  | 154                                                                                 |
| 3.0                                 | 559                  | 1.0 | 300  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 110_300                                                                          | P80                                                                                 | BN80A6                                                                                  | 140                                                                                 |
| 3.0                                 | 571                  | 1.8 | 300  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_300                                                                         | P80                                                                                 | BN80A6                                                                                  | 144                                                                                 |
| 3.0                                 | 547                  | 1.9 | 300  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_300                                                                     | P80                                                                                 | BN80A6                                                                                  | 141                                                                                 |
| 3.4                                 | 423                  | 1.2 | 400  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_400                                                                      | P71                                                                                 | BN71B4                                                                                  | 137                                                                                 |
| 3.4                                 | 464                  | 2.2 | 400  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_400                                                                     | P71                                                                                 | BN71B4                                                                                  | 141                                                                                 |
| 3.8                                 | 494                  | 1.2 | 240  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 110_240                                                                          | P80                                                                                 | BN80A6                                                                                  | 140                                                                                 |
| 3.8                                 | 503                  | 2.4 | 240  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_240                                                                         | P80                                                                                 | BN80A6                                                                                  | 144                                                                                 |
| 4.0                                 | 455                  | 2.3 | 230  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_230                                                                     | P80                                                                                 | BN80A6                                                                                  | 141                                                                                 |
| 4.6                                 | 395                  | 1.4 | 300  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 110_300                                                                          | P71                                                                                 | BN71B4                                                                                  | 140                                                                                 |
| 4.6                                 | 348                  | 1.4 | 300  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_300                                                                      | P71                                                                                 | BN71B4                                                                                  | 137                                                                                 |
| 4.6                                 | 371                  | 2.7 | 300  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_300                                                                     | P71                                                                                 | BN71B4                                                                                  | 141                                                                                 |
| 4.7                                 | 410                  | 1.0 | 192  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_192                                                                           | P80                                                                                 | BN80A6                                                                                  | 136                                                                                 |
| 4.7                                 | 425                  | 1.6 | 192  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 110_192                                                                          | P80                                                                                 | BN80A6                                                                                  | 140                                                                                 |
| 4.7                                 | 432                  | 3.0 | 192  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_192                                                                         | P80                                                                                 | BN80A6                                                                                  | 144                                                                                 |
| 5.4                                 | 372                  | 1.0 | 168  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_168                                                                           | P80                                                                                 | BN80A6                                                                                  | 136                                                                                 |
| 5.4                                 | 391                  | 2.0 | 168  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 110_168                                                                          | P80                                                                                 | BN80A6                                                                                  | 140                                                                                 |
| 5.4                                 | 391                  | 3.4 | 168  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_168                                                                         | P80                                                                                 | BN80A6                                                                                  | 144                                                                                 |
| 5.7                                 | 328                  | 0.9 | 240  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_240                                                                           | P71                                                                                 | BN71B4                                                                                  | 136                                                                                 |
| 5.7                                 | 347                  | 1.6 | 240  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 110_240                                                                          | P71                                                                                 | BN71B4                                                                                  | 140                                                                                 |
| 6.0                                 | 320                  | 1.6 | 230  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 44/86_230                                                                      | P71                                                                                 | BN71B4                                                                                  | 137                                                                                 |
| 6.0                                 | 308                  | 3.2 | 230  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_230                                                                     | P71                                                                                 | BN71B4                                                                                  | 141                                                                                 |
| 6.1                                 | 320                  | 1.0 | 150  | 6200                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 75_150                                                                           | P80                                                                                 | BN80A6                                                                                  | 132                                                                                 |
| 6.6                                 | 327                  | 1.3 | 138  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_138                                                                           | P80                                                                                 | BN80A6                                                                                  | 136                                                                                 |
| 6.6                                 | 338                  | 2.4 | 138  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 110_138                                                                          | P80                                                                                 | BN80A6                                                                                  | 140                                                                                 |



## 0.37 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i   | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |     |
|-------------------------------------|----------------------|-----|-----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|
| 7.1                                 | 287                  | 1.1 | 192 | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_192                                                                           | P71                                                                                 | BN71B4                                                                                  | 136                                                                                 |     |
| 7.1                                 | 297                  | 2.1 | 192 | 8000                 |                                                                                   | —                                                                                 |                                                                                   | WR 110_192                                                                          | P71                                                                                 | BN71B4                                                                                  | 140                                                                                 |     |
| 7.6                                 | 294                  | 1.5 | 120 | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_120                                                                           | P80                                                                                 | BN80A6                                                                                  | 136                                                                                 |     |
| 7.6                                 | 303                  | 2.9 | 120 | 8000                 |                                                                                   | —                                                                                 |                                                                                   | WR 110_120                                                                          | P80                                                                                 | BN80A6                                                                                  | 140                                                                                 |     |
| 7.6                                 | 255                  | 0.9 | 180 | 6200                 |                                                                                   | —                                                                                 |                                                                                   | WR 75_180                                                                           | P71                                                                                 | BN71B4                                                                                  | 132                                                                                 |     |
| 8.2                                 | 260                  | 1.4 | 168 | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_168                                                                           | P71                                                                                 | BN71B4                                                                                  | 136                                                                                 |     |
| 8.2                                 | 273                  | 2.6 | 168 | 8000                 |                                                                                   | —                                                                                 |                                                                                   | WR 110_168                                                                          | P71                                                                                 | BN71B4                                                                                  | 140                                                                                 |     |
| 9.1                                 | 214                  | 1.2 | 100 | 7000                 | W 86_100                                                                          | S1                                                                                | M1LA6                                                                             | 134                                                                                 | W 86_100                                                                            | P80                                                                                     | BN80A6                                                                              | 135 |
| 9.1                                 | 224                  | 1.2 | 150 | 6200                 |                                                                                   | —                                                                                 |                                                                                   | WR 75_150                                                                           | P71                                                                                 | BN71B4                                                                                  | 132                                                                                 |     |
| 9.9                                 | 224                  | 1.8 | 138 | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_138                                                                           | P71                                                                                 | BN71B4                                                                                  | 136                                                                                 |     |
| 9.9                                 | 235                  | 3.0 | 138 | 8000                 |                                                                                   | —                                                                                 |                                                                                   | WR 110_138                                                                          | P71                                                                                 | BN71B4                                                                                  | 140                                                                                 |     |
| 10.1                                | 234                  | 1.6 | 90  | 6200                 |                                                                                   | —                                                                                 |                                                                                   | WR 75_90                                                                            | P80                                                                                 | BN80A6                                                                                  | 132                                                                                 |     |
| 11.4                                | 168                  | 1.2 | 80  | 6200                 | W 75_80                                                                           | S1                                                                                | M1LA6                                                                             | 130                                                                                 | W 75_80                                                                             | P80                                                                                     | BN80A6                                                                              | 131 |
| 11.4                                | 183                  | 1.5 | 80  | 7000                 | W 86_80                                                                           | S1                                                                                | M1LA6                                                                             | 134                                                                                 | W 86_80                                                                             | P80                                                                                     | BN80A6                                                                              | 135 |
| 11.4                                | 195                  | 1.6 | 120 | 6200                 |                                                                                   | —                                                                                 |                                                                                   | WR 75_120                                                                           | P71                                                                                 | BN71B4                                                                                  | 132                                                                                 |     |
| 11.4                                | 204                  | 1.9 | 120 | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_120                                                                           | P71                                                                                 | BN71B4                                                                                  | 136                                                                                 |     |
| 12.0                                | 179                  | 1.0 | 114 | 5000                 |                                                                                   | —                                                                                 |                                                                                   | WR 63_114                                                                           | P71                                                                                 | BN71B4                                                                                  | 128                                                                                 |     |
| 12.1                                | 204                  | 1.6 | 75  | 6200                 |                                                                                   | —                                                                                 |                                                                                   | WR 75_75                                                                            | P80                                                                                 | BN80A6                                                                                  | 132                                                                                 |     |
| 13.2                                | 196                  | 2.0 | 69  | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_69                                                                            | P80                                                                                 | BN80A6                                                                                  | 136                                                                                 |     |
| 13.7                                | 142                  | 1.1 | 100 | 6200                 | W 75_100                                                                          | S1                                                                                | M1SD4                                                                             | 130                                                                                 | W 75_100                                                                            | P71                                                                                     | BN71B4                                                                              | 131 |
| 13.7                                | 152                  | 1.5 | 100 | 7000                 | W 86_100                                                                          | S1                                                                                | M1SD4                                                                             | 134                                                                                 | W 86_100                                                                            | P71                                                                                     | BN71B4                                                                              | 135 |
| 14.2                                | 139                  | 1.0 | 64  | 5000                 | W 63_64                                                                           | S1                                                                                | M1LA6                                                                             | 126                                                                                 | W 63_64                                                                             | P80                                                                                     | BN80A6                                                                              | 127 |
| 15.2                                | 140                  | 1.5 | 60  | 6200                 | W 75_60                                                                           | S1                                                                                | M1LA6                                                                             | 130                                                                                 | W 75_60                                                                             | P80                                                                                     | BN80A6                                                                              | 131 |
| 15.2                                | 149                  | 1.3 | 90  | 5000                 |                                                                                   | —                                                                                 |                                                                                   | WR 63_90                                                                            | P71                                                                                 | BN71B4                                                                                  | 128                                                                                 |     |
| 15.2                                | 160                  | 2.0 | 90  | 6200                 |                                                                                   | —                                                                                 |                                                                                   | WR 75_90                                                                            | P71                                                                                 | BN71B4                                                                                  | 132                                                                                 |     |
| 15.2                                | 156                  | 2.8 | 90  | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_90                                                                            | P71                                                                                 | BN71B4                                                                                  | 136                                                                                 |     |
| 16.3                                | 144                  | 2.3 | 56  | 7000                 | W 86_56                                                                           | S1                                                                                | M1LA6                                                                             | 134                                                                                 | W 86_56                                                                             | P80                                                                                     | BN80A6                                                                              | 135 |
| 17.1                                | 116                  | 1.0 | 80  | 5000                 | W 63_80                                                                           | S1                                                                                | M1SD4                                                                             | 126                                                                                 | W 63_80                                                                             | P71                                                                                     | BN71B4                                                                              | 127 |
| 17.1                                | 122                  | 1.5 | 80  | 6200                 | W 75_80                                                                           | S1                                                                                | M1SD4                                                                             | 130                                                                                 | W 75_80                                                                             | P71                                                                                     | BN71B4                                                                              | 131 |
| 17.1                                | 132                  | 1.9 | 80  | 7000                 | W 86_80                                                                           | S1                                                                                | M1SD4                                                                             | 134                                                                                 | W 86_80                                                                             | P71                                                                                     | BN71B4                                                                              | 135 |
| 18.3                                | 141                  | 2.1 | 75  | 6200                 |                                                                                   | —                                                                                 |                                                                                   | WR 75_75                                                                            | P71                                                                                 | BN71B4                                                                                  | 132                                                                                 |     |
| 19.0                                | 130                  | 1.4 | 72  | 4830                 |                                                                                   | —                                                                                 |                                                                                   | WR 63_72                                                                            | P71                                                                                 | BN71B4                                                                                  | 128                                                                                 |     |
| 19.9                                | 133                  | 2.8 | 69  | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_69                                                                            | P71                                                                                 | BN71B4                                                                                  | 136                                                                                 |     |
| 20.2                                | 136                  | 2.6 | 45  | 6200                 |                                                                                   | —                                                                                 |                                                                                   | WR 75_45                                                                            | P80                                                                                 | BN80A6                                                                                  | 132                                                                                 |     |
| 21.4                                | 101                  | 1.2 | 64  | 4870                 | W 63_64                                                                           | S1                                                                                | M1SD4                                                                             | 126                                                                                 | W 63_64                                                                             | P71                                                                                     | BN71B4                                                                              | 127 |
| 21.4                                | 112                  | 2.5 | 64  | 7000                 | W 86_64                                                                           | S1                                                                                | M1SD4                                                                             | 134                                                                                 | W 86_64                                                                             | P71                                                                                     | BN71B4                                                                              | 135 |
| 22.8                                | 101                  | 2.0 | 60  | 6200                 | W 75_60                                                                           | S1                                                                                | M1SD4                                                                             | 130                                                                                 | W 75_60                                                                             | P71                                                                                     | BN71B4                                                                              | 131 |
| 22.8                                | 119                  | 2.5 | 60  | 6200                 |                                                                                   | —                                                                                 |                                                                                   | WR 75_60                                                                            | P71                                                                                 | BN71B4                                                                                  | 132                                                                                 |     |
| 22.8                                | 119                  | 3.2 | 60  | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_60                                                                            | P71                                                                                 | BN71B4                                                                                  | 136                                                                                 |     |
| 24.0                                | 107                  | 1.7 | 57  | 4540                 |                                                                                   | —                                                                                 |                                                                                   | WR 63_57                                                                            | P71                                                                                 | BN71B4                                                                                  | 128                                                                                 |     |
| 24.5                                | 101                  | 3.0 | 56  | 7000                 | W 86_56                                                                           | S1                                                                                | M1SD4                                                                             | 134                                                                                 | W 86_56                                                                             | P71                                                                                     | BN71B4                                                                              | 135 |
| 27.4                                | 88                   | 2.5 | 50  | 6200                 | W 75_50                                                                           | S1                                                                                | M1SD4                                                                             | 130                                                                                 | W 75_50                                                                             | P71                                                                                     | BN71B4                                                                              | 131 |
| 30                                  | 73                   | 0.9 | 45  | 2680                 |                                                                                   | —                                                                                 |                                                                                   | VF 49_45                                                                            | P71                                                                                 | BN71B4                                                                                  | 120                                                                                 |     |
| 30                                  | 78                   | 1.9 | 45  | 4400                 | W 63_45                                                                           | S1                                                                                | M1SD4                                                                             | 126                                                                                 | W 63_45                                                                             | P71                                                                                     | BN71B4                                                                              | 127 |
| 30                                  | 88                   | 2.0 | 45  | 4250                 |                                                                                   | —                                                                                 |                                                                                   | WR 63_45                                                                            | P71                                                                                 | BN71B4                                                                                  | 128                                                                                 |     |
| 30                                  | 93                   | 3.2 | 45  | 5885                 |                                                                                   | —                                                                                 |                                                                                   | WR 75_45                                                                            | P71                                                                                 | BN71B4                                                                                  | 132                                                                                 |     |
| 34                                  | 74                   | 3.4 | 40  | 5820                 | W 75_40                                                                           | S1                                                                                | M1SD4                                                                             | 130                                                                                 | W 75_40                                                                             | P71                                                                                     | BN71B4                                                                              | 131 |
| 36                                  | 69                   | 2.3 | 38  | 4180                 | W 63_38                                                                           | S1                                                                                | M1SD4                                                                             | 126                                                                                 | W 63_38                                                                             | P71                                                                                     | BN71B4                                                                              | 127 |
| 38                                  | 62                   | 1.1 | 36  | 2530                 |                                                                                   | —                                                                                 |                                                                                   | VF 49_36                                                                            | P71                                                                                 | BN71B4                                                                                  | 120                                                                                 |     |
| 38                                  | 73                   | 2.2 | 36  | 3980                 |                                                                                   | —                                                                                 |                                                                                   | WR 63_36                                                                            | P71                                                                                 | BN71B4                                                                                  | 128                                                                                 |     |
| 46                                  | 57                   | 2.8 | 30  | 3900                 | W 63_30                                                                           | S1                                                                                | M1SD4                                                                             | 126                                                                                 | W 63_30                                                                             | P71                                                                                     | BN71B4                                                                              | 127 |
| 49                                  | 51                   | 1.4 | 28  | 2360                 |                                                                                   | —                                                                                 |                                                                                   | VF 49_28                                                                            | P71                                                                                 | BN71B4                                                                                  | 120                                                                                 |     |
| 57                                  | 46                   | 1.4 | 24  | 2250                 |                                                                                   | —                                                                                 |                                                                                   | VF 49_24                                                                            | P71                                                                                 | BN71B4                                                                                  | 120                                                                                 |     |
| 57                                  | 48                   | 3.2 | 24  | 3650                 | W 63_24                                                                           | S1                                                                                | M1SD4                                                                             | 126                                                                                 | W 63_24                                                                             | P71                                                                                     | BN71B4                                                                              | 127 |
| 65                                  | 42                   | 1.7 | 14  | 1940                 |                                                                                   | —                                                                                 |                                                                                   | VF 49_14                                                                            | P80                                                                                 | BN80A6                                                                                  | 120                                                                                 |     |
| 69                                  | 40                   | 1.0 | 20  | 1870                 |                                                                                   | —                                                                                 |                                                                                   | VF 44_20                                                                            | P71                                                                                 | BN71B4                                                                                  | 114                                                                                 |     |
| 72                                  | 40                   | 3.8 | 19  | 3400                 | W 63_19                                                                           | S1                                                                                | M1SD4                                                                             | 126                                                                                 | W 63_19                                                                             | P71                                                                                     | BN71B4                                                                              | 127 |
| 76                                  | 36                   | 1.6 | 18  | 2080                 |                                                                                   | —                                                                                 |                                                                                   | VF 49_18                                                                            | P71                                                                                 | BN71B4                                                                                  | 120                                                                                 |     |
| 79                                  | 33                   | 0.9 | 35  | 1860                 |                                                                                   | —                                                                                 |                                                                                   | VF 44_35                                                                            | P71                                                                                 | BN71A2                                                                                  | 114                                                                                 |     |
| 91                                  | 32                   | 2.0 | 10  | 1930                 |                                                                                   | —                                                                                 |                                                                                   | VF 49_10                                                                            | P80                                                                                 | BN80A6                                                                                  | 120                                                                                 |     |
| 98                                  | 29                   | 1.0 | 14  | 1690                 |                                                                                   | —                                                                                 |                                                                                   | VF 44_14                                                                            | P71                                                                                 | BN71B4                                                                                  | 114                                                                                 |     |
| 98                                  | 29                   | 2.2 | 14  | 1940                 |                                                                                   | —                                                                                 |                                                                                   | VF 49_14                                                                            | P71                                                                                 | BN71B4                                                                                  | 120                                                                                 |     |
| 117                                 | 24                   | 2.0 | 24  | 1880                 |                                                                                   | —                                                                                 |                                                                                   | VF 49_24                                                                            | P71                                                                                 | BN71A2                                                                                  | 120                                                                                 |     |
| 137                                 | 22                   | 1.3 | 10  | 1520                 |                                                                                   | —                                                                                 |                                                                                   | VF 44_10                                                                            | P71                                                                                 | BN71B4                                                                                  | 114                                                                                 |     |
| 137                                 | 22                   | 2.7 | 10  | 1750                 |                                                                                   | —                                                                                 |                                                                                   | VF 49_10                                                                            | P71                                                                                 | BN71B4                                                                                  | 120                                                                                 |     |

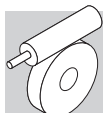


## 0.37 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i  | Rn <sub>2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 138                                 | 21                   | 1.4 | 20 | 1570                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_20                                                                            | P71                                                                                 | BN71A2                                                                                  | 114                                                                                 |
| 153                                 | 19                   | 2.3 | 18 | 1720                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_18                                                                            | P71                                                                                 | BN71A2                                                                                  | 120                                                                                 |
| 196                                 | 16                   | 1.9 | 7  | 1360                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_7                                                                             | P71                                                                                 | BN71B4                                                                                  | 114                                                                                 |
| 196                                 | 16                   | 3.5 | 7  | 1570                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 49_7                                                                             | P71                                                                                 | BN71B4                                                                                  | 120                                                                                 |
| 275                                 | 11                   | 2.0 | 10 | 1260                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_10                                                                            | P71                                                                                 | BN71A2                                                                                  | 114                                                                                 |
| 393                                 | 8                    | 2.8 | 7  | 1120                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 44_7                                                                             | P71                                                                                 | BN71A2                                                                                  | 114                                                                                 |

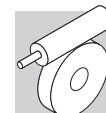
## 0.55 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i    | Rn <sub>2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|------|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 0.29                                | 4019                 | 1.1 | 3200 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_3200                                                                    | P80                                                                                 | BN80B6                                                                                  | 162                                                                                 |
| 0.36                                | 3946                 | 1.1 | 2560 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_2560                                                                    | P80                                                                                 | BN80B6                                                                                  | 162                                                                                 |
| 0.43                                | 2902                 | 1.4 | 3200 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_3200                                                                    | P80                                                                                 | BN80A4                                                                                  | 162                                                                                 |
| 0.47                                | 3004                 | 0.9 | 2944 | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_2944                                                                    | P80                                                                                 | BN80A4                                                                                  | 154                                                                                 |
| 0.50                                | 3362                 | 1.3 | 1840 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_1840                                                                    | P80                                                                                 | BN80B6                                                                                  | 162                                                                                 |
| 0.54                                | 2805                 | 1.5 | 2560 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_2560                                                                    | P80                                                                                 | BN80A4                                                                                  | 162                                                                                 |
| 0.76                                | 2642                 | 1.0 | 1840 | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_1840                                                                    | P80                                                                                 | BN80A4                                                                                  | 154                                                                                 |
| 0.76                                | 2364                 | 1.8 | 1840 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_1840                                                                    | P80                                                                                 | BN80A4                                                                                  | 162                                                                                 |
| 0.77                                | 1905                 | 0.9 | 1800 | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_1800                                                                    | P80                                                                                 | BN80A4                                                                                  | 146                                                                                 |
| 0.87                                | 2116                 | 2.0 | 1600 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_1600                                                                    | P80                                                                                 | BN80A4                                                                                  | 162                                                                                 |
| 0.91                                | 1838                 | 1.0 | 1520 | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_1520                                                                    | P80                                                                                 | BN80A4                                                                                  | 146                                                                                 |
| 1.0                                 | 1996                 | 2.2 | 920  | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_920                                                                     | P80                                                                                 | BN80B6                                                                                  | 162                                                                                 |
| 1.0                                 | 2190                 | 1.2 | 1380 | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_1380                                                                    | P80                                                                                 | BN80A4                                                                                  | 154                                                                                 |
| 1.2                                 | 1542                 | 1.2 | 1200 | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_1200                                                                    | P80                                                                                 | BN80A4                                                                                  | 146                                                                                 |
| 1.2                                 | 1542                 | 2.7 | 1200 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_1200                                                                    | P80                                                                                 | BN80A4                                                                                  | 162                                                                                 |
| 1.3                                 | 1852                 | 1.5 | 690  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_690                                                                     | P80                                                                                 | BN80B6                                                                                  | 154                                                                                 |
| 1.4                                 | 1342                 | 1.3 | 960  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_960                                                                     | P80                                                                                 | BN80A4                                                                                  | 146                                                                                 |
| 1.5                                 | 1564                 | 1.7 | 920  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_920                                                                     | P80                                                                                 | BN80A4                                                                                  | 154                                                                                 |
| 1.5                                 | 1460                 | 2.9 | 920  | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_920                                                                     | P80                                                                                 | BN80A4                                                                                  | 162                                                                                 |
| 1.5                                 | 1473                 | 3.0 | 600  | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_600                                                                     | P80                                                                                 | BN80B6                                                                                  | 162                                                                                 |
| 1.7                                 | 1300                 | 3.2 | 800  | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/185_800                                                                     | P80                                                                                 | BN80A4                                                                                  | 162                                                                                 |
| 1.7                                 | 1570                 | 1.7 | 529  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_529                                                                     | P80                                                                                 | BN80B6                                                                                  | 154                                                                                 |
| 1.8                                 | 1120                 | 1.6 | 760  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_760                                                                     | P80                                                                                 | BN80A4                                                                                  | 146                                                                                 |
| 2.0                                 | 1304                 | 2.0 | 690  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_690                                                                     | P80                                                                                 | BN80A4                                                                                  | 154                                                                                 |
| 2.3                                 | 1028                 | 1.0 | 400  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_400                                                                     | P80                                                                                 | BN80B6                                                                                  | 141                                                                                 |
| 2.3                                 | 907                  | 2.0 | 600  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_600                                                                     | P80                                                                                 | BN80A4                                                                                  | 146                                                                                 |
| 2.6                                 | 837                  | 1.2 | 540  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_540                                                                     | P80                                                                                 | BN80A4                                                                                  | 141                                                                                 |
| 2.6                                 | 1099                 | 2.4 | 529  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_529                                                                     | P80                                                                                 | BN80A4                                                                                  | 154                                                                                 |
| 3.0                                 | 956                  | 2.7 | 460  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_460                                                                     | P80                                                                                 | BN80A4                                                                                  | 154                                                                                 |
| 3.1                                 | 839                  | 1.2 | 300  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_300                                                                         | P80                                                                                 | BN80B6                                                                                  | 144                                                                                 |
| 3.1                                 | 805                  | 1.3 | 300  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_300                                                                     | P80                                                                                 | BN80B6                                                                                  | 141                                                                                 |
| 3.5                                 | 680                  | 1.5 | 400  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_400                                                                     | P80                                                                                 | BN80A4                                                                                  | 141                                                                                 |
| 3.5                                 | 665                  | 2.7 | 400  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_400                                                                     | P80                                                                                 | BN80A4                                                                                  | 146                                                                                 |
| 3.8                                 | 740                  | 1.6 | 240  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_240                                                                         | P80                                                                                 | BN80B6                                                                                  | 144                                                                                 |
| 4.0                                 | 670                  | 1.6 | 230  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_230                                                                     | P80                                                                                 | BN80B6                                                                                  | 141                                                                                 |
| 4.0                                 | 756                  | 3.4 | 345  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 86/150_345                                                                     | P80                                                                                 | BN80A4                                                                                  | 154                                                                                 |
| 4.6                                 | 578                  | 0.9 | 300  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 110_300                                                                          | P80                                                                                 | BN80A4                                                                                  | 140                                                                                 |
| 4.6                                 | 601                  | 1.5 | 300  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_300                                                                         | P80                                                                                 | BN80A4                                                                                  | 144                                                                                 |
| 4.6                                 | 544                  | 1.8 | 300  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_300                                                                     | P80                                                                                 | BN80A4                                                                                  | 141                                                                                 |
| 4.8                                 | 625                  | 1.1 | 192  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 110_192                                                                          | P80                                                                                 | BN80B6                                                                                  | 140                                                                                 |
| 5.0                                 | 529                  | 3.4 | 280  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | W/VF 63/130_280                                                                     | P80                                                                                 | BN80A4                                                                                  | 146                                                                                 |
| 5.8                                 | 508                  | 1.1 | 240  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 110_240                                                                          | P80                                                                                 | BN80A4                                                                                  | 140                                                                                 |
| 5.8                                 | 517                  | 2.2 | 240  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_240                                                                         | P80                                                                                 | BN80A4                                                                                  | 144                                                                                 |
| 6.0                                 | 452                  | 2.2 | 230  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | VF/W 49/110_230                                                                     | P80                                                                                 | BN80A4                                                                                  | 141                                                                                 |
| 6.7                                 | 504                  | 3.0 | 138  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_138                                                                         | P80                                                                                 | BN80B6                                                                                  | 144                                                                                 |
| 7.2                                 | 435                  | 1.4 | 192  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 110_192                                                                          | P80                                                                                 | BN80A4                                                                                  | 140                                                                                 |
| 7.2                                 | 443                  | 2.7 | 192  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_192                                                                         | P80                                                                                 | BN80A4                                                                                  | 144                                                                                 |
| 7.7                                 | 432                  | 1.0 | 120  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_120                                                                           | P80                                                                                 | BN80B6                                                                                  | 136                                                                                 |
| 8.3                                 | 381                  | 0.9 | 168  | 7000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 86_168                                                                           | P80                                                                                 | BN80A4                                                                                  | 136                                                                                 |
| 8.3                                 | 400                  | 1.8 | 168  | 8000                 | —                                                                                 | —                                                                                 | —                                                                                 | WR 110_168                                                                          | P80                                                                                 | BN80A4                                                                                  | 140                                                                                 |
| 8.3                                 | 406                  | 3.0 | 168  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_168                                                                         | P80                                                                                 | BN80A4                                                                                  | 144                                                                                 |



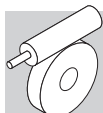
## 0.55 kW

| n2<br>min-1 | M2<br>Nm | S   | i   | Rn2<br>N |  |  |  |  |  | IEC  |  |     |
|-------------|----------|-----|-----|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|
| 9.2         | 325      | 1.5 | 100 | 8000     | W 110_100                                                                         | S2                                                                                | M2SA6                                                                             | 138                                                                                 | W 110_100                                                                           | P80                                                                                     | BN80B6                                                                              | 139 |
| 10.1        | 329      | 1.2 | 138 | 7000     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 86_138                                                                           | P80                                                                                     | BN80A4                                                                              | 136 |
| 10.1        | 344      | 2.1 | 138 | 8000     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 110_138                                                                          | P80                                                                                     | BN80A4                                                                              | 140 |
| 10.2        | 344      | 1.1 | 90  | 6200     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 75_90                                                                            | P80                                                                                     | BN80B6                                                                              | 132 |
| 11.5        | 269      | 1.0 | 80  | 7000     | W 86_80                                                                           | S2                                                                                | M2SA6                                                                             | 134                                                                                 | W 86_80                                                                             | P80                                                                                     | BN80B6                                                                              | 135 |
| 11.6        | 286      | 1.1 | 120 | 6200     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 75_120                                                                           | P80                                                                                     | BN80A4                                                                              | 132 |
| 11.6        | 299      | 1.3 | 120 | 7000     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 86_120                                                                           | P80                                                                                     | BN80A4                                                                              | 136 |
| 11.6        | 308      | 2.6 | 120 | 8000     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 110_120                                                                          | P80                                                                                     | BN80A4                                                                              | 140 |
| 12.3        | 300      | 1.1 | 75  | 6200     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 75_75                                                                            | P80                                                                                     | BN80B6                                                                              | 132 |
| 13.3        | 288      | 1.4 | 69  | 7000     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 86_69                                                                            | P80                                                                                     | BN80B6                                                                              | 136 |
| 13.3        | 295      | 2.5 | 69  | 8000     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 110_69                                                                           | P80                                                                                     | BN80B6                                                                              | 140 |
| 13.8        | 225      | 1.0 | 100 | 7000     | W 86_100                                                                          | S1                                                                                | M1LA4                                                                             | 134                                                                                 | W 86_100                                                                            | P80                                                                                     | BN80A4                                                                              | 135 |
| 15.4        | 235      | 1.4 | 90  | 6200     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 75_90                                                                            | P80                                                                                     | BN80A4                                                                              | 132 |
| 15.4        | 228      | 1.9 | 90  | 7000     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 86_90                                                                            | P80                                                                                     | BN80A4                                                                              | 136 |
| 15.4        | 238      | 3.5 | 90  | 8000     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 110_90                                                                           | P80                                                                                     | BN80A4                                                                              | 140 |
| 16.4        | 211      | 1.5 | 56  | 7000     | W 86_56                                                                           | S2                                                                                | M2SA6                                                                             | 134                                                                                 | W 86_56                                                                             | P80                                                                                     | BN80B6                                                                              | 135 |
| 17.3        | 180      | 1.0 | 80  | 6200     | W 75_80                                                                           | S1                                                                                | M1LA4                                                                             | 130                                                                                 | W 75_80                                                                             | P80                                                                                     | BN80A4                                                                              | 131 |
| 17.3        | 195      | 1.3 | 80  | 7000     | W 86_80                                                                           | S1                                                                                | M1LA4                                                                             | 134                                                                                 | W 86_80                                                                             | P80                                                                                     | BN80A4                                                                              | 135 |
| 18.5        | 207      | 1.4 | 75  | 6200     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 75_75                                                                            | P80                                                                                     | BN80A4                                                                              | 132 |
| 20.1        | 196      | 1.9 | 69  | 7000     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 86_69                                                                            | P80                                                                                     | BN80A4                                                                              | 136 |
| 20.1        | 201      | 3.2 | 69  | 8000     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 110_69                                                                           | P80                                                                                     | BN80A4                                                                              | 140 |
| 20.4        | 162      | 1.0 | 45  | 4540     | W 63_45                                                                           | S2                                                                                | M2SA6                                                                             | 126                                                                                 | W 63_45                                                                             | P80                                                                                     | BN80B6                                                                              | 127 |
| 21.6        | 166      | 1.7 | 64  | 7000     | W 86_64                                                                           | S1                                                                                | M1LA4                                                                             | 134                                                                                 | W 86_64                                                                             | P80                                                                                     | BN80A4                                                                              | 135 |
| 23.0        | 148      | 1.3 | 60  | 6200     | W 75_60                                                                           | S1                                                                                | M1LA4                                                                             | 130                                                                                 | W 75_60                                                                             | P80                                                                                     | BN80A4                                                                              | 131 |
| 23.0        | 162      | 2.2 | 40  | 7000     | W 86_40                                                                           | S2                                                                                | M2SA6                                                                             | 134                                                                                 | W 86_40                                                                             | P80                                                                                     | BN80B6                                                                              | 135 |
| 23.2        | 175      | 1.7 | 60  | 6040     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 75_60                                                                            | P80                                                                                     | BN80A4                                                                              | 132 |
| 23.2        | 175      | 2.2 | 60  | 7000     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 86_60                                                                            | P80                                                                                     | BN80A4                                                                              | 136 |
| 24.2        | 143      | 1.2 | 38  | 4340     | W 63_38                                                                           | S2                                                                                | M2SA6                                                                             | 126                                                                                 | W 63_38                                                                             | P80                                                                                     | BN80B6                                                                              | 127 |
| 24.6        | 149      | 2.0 | 56  | 7000     | W 86_56                                                                           | S1                                                                                | M1LA4                                                                             | 134                                                                                 | W 86_56                                                                             | P80                                                                                     | BN80A4                                                                              | 135 |
| 27.6        | 129      | 1.7 | 50  | 5960     | W 75_50                                                                           | S1                                                                                | M1LA4                                                                             | 130                                                                                 | W 75_50                                                                             | P80                                                                                     | BN80A4                                                                              | 131 |
| 30          | 128      | 2.7 | 46  | 7000     | W 86_46                                                                           | S1                                                                                | M1LA4                                                                             | 134                                                                                 | W 86_46                                                                             | P80                                                                                     | BN80A4                                                                              | 135 |
| 31          | 115      | 1.3 | 45  | 4140     | W 63_45                                                                           | S1                                                                                | M1LA4                                                                             | 126                                                                                 | W 63_45                                                                             | P80                                                                                     | BN80A4                                                                              | 127 |
| 31          | 136      | 2.2 | 45  | 5580     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 75_45                                                                            | P80                                                                                     | BN80A4                                                                              | 132 |
| 31          | 133      | 2.9 | 45  | 7000     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 86_45                                                                            | P80                                                                                     | BN80A4                                                                              | 136 |
| 35          | 110      | 2.3 | 40  | 5610     | W 75_40                                                                           | S1                                                                                | M1LA4                                                                             | 130                                                                                 | W 75_40                                                                             | P80                                                                                     | BN80A4                                                                              | 131 |
| 35          | 114      | 2.9 | 40  | 7000     | W 86_40                                                                           | S1                                                                                | M1LA4                                                                             | 134                                                                                 | W 86_40                                                                             | P80                                                                                     | BN80A4                                                                              | 135 |
| 36          | 101      | 1.5 | 38  | 3950     | W 63_38                                                                           | S1                                                                                | M1LA4                                                                             | 126                                                                                 | W 63_38                                                                             | P80                                                                                     | BN80A4                                                                              | 127 |
| 40          | 105      | 3.3 | 23  | 7000     | W 86_23                                                                           | S2                                                                                | M2SA6                                                                             | 134                                                                                 | W 86_23                                                                             | P80                                                                                     | BN80B6                                                                              | 135 |
| 46          | 84       | 1.9 | 30  | 3700     | W 63_30                                                                           | S1                                                                                | M1LA4                                                                             | 126                                                                                 | W 63_30                                                                             | P80                                                                                     | BN80A4                                                                              | 127 |
| 46          | 88       | 3.1 | 30  | 5150     | W 75_30                                                                           | S1                                                                                | M1LA4                                                                             | 130                                                                                 | W 75_30                                                                             | P80                                                                                     | BN80A4                                                                              | 131 |
| 46          | 95       | 2.9 | 30  | 4950     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | WR 75_30                                                                            | P80                                                                                     | BN80A4                                                                              | 132 |
| 49          | 76       | 1.0 | 28  | 2170     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 49_28                                                                            | P80                                                                                     | BN80A4                                                                              | 120 |
| 55          | 76       | 3.3 | 25  | 4880     | W 75_25                                                                           | S1                                                                                | M1LA4                                                                             | 130                                                                                 | W 75_25                                                                             | P80                                                                                     | BN80A4                                                                              | 131 |
| 58          | 69       | 0.9 | 24  | 2080     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 49_24                                                                            | P80                                                                                     | BN80A4                                                                              | 120 |
| 58          | 71       | 2.2 | 24  | 3480     | W 63_24                                                                           | S1                                                                                | M1LA4                                                                             | 126                                                                                 | W 63_24                                                                             | P80                                                                                     | BN80A4                                                                              | 127 |
| 66          | 62       | 1.1 | 14  | 1960     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 49_14                                                                            | P80                                                                                     | BN80B6                                                                              | 120 |
| 73          | 59       | 2.6 | 19  | 3260     | W 63_19                                                                           | S1                                                                                | M1LA4                                                                             | 126                                                                                 | W 63_19                                                                             | P80                                                                                     | BN80A4                                                                              | 127 |
| 77          | 53       | 1.1 | 18  | 1930     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 49_18                                                                            | P80                                                                                     | BN80A4                                                                              | 120 |
| 92          | 47       | 1.4 | 10  | 1800     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 49_10                                                                            | P80                                                                                     | BN80B6                                                                              | 120 |
| 92          | 47       | 3.2 | 15  | 3050     | W 63_15                                                                           | S1                                                                                | M1LA4                                                                             | 126                                                                                 | W 63_15                                                                             | P80                                                                                     | BN80A4                                                                              | 127 |
| 99          | 43       | 1.5 | 14  | 1810     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 49_14                                                                            | P80                                                                                     | BN80A4                                                                              | 120 |
| 115         | 39       | 3.6 | 12  | 2850     | W 63_12                                                                           | S1                                                                                | M1LA4                                                                             | 126                                                                                 | W 63_12                                                                             | P80                                                                                     | BN80A4                                                                              | 127 |
| 117         | 35       | 1.3 | 24  | 1800     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 49_24                                                                            | P71                                                                                     | BN71B2                                                                              | 120 |
| 131         | 35       | 3.7 | 7   | 2700     | W 63_7                                                                            | S2                                                                                | M2SA6                                                                             | 126                                                                                 | W 63_7                                                                              | P80                                                                                     | BN80B6                                                                              | 127 |
| 138         | 32       | 1.8 | 10  | 1650     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 49_10                                                                            | P80                                                                                     | BN80A4                                                                              | 120 |
| 141         | 30       | 1.0 | 20  | 1490     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 44_20                                                                            | P71                                                                                     | BN71B2                                                                              | 114 |
| 156         | 28       | 1.6 | 18  | 1650     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 49_18                                                                            | P71                                                                                     | BN71B2                                                                              | 120 |
| 197         | 23       | 2.4 | 7   | 1480     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 49_7                                                                             | P80                                                                                     | BN80A4                                                                              | 120 |
| 281         | 16       | 1.4 | 10  | 1210     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 44_10                                                                            | P71                                                                                     | BN71B2                                                                              | 114 |
| 281         | 16       | 2.7 | 10  | 1390     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 49_10                                                                            | P71                                                                                     | BN71B2                                                                              | 120 |
| 401         | 12       | 1.9 | 7   | 1080     | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | VF 44_7                                                                             | P71                                                                                     | BN71B2                                                                              | 114 |



## 0.75 kW

| n2<br>min-1 | M2<br>Nm | S   | i    | Rn2<br>N |  |  |  |  |  | IEC  |  |
|-------------|----------|-----|------|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 0.29        | 4983     | 1.3 | 3200 | 34500    | —                                                                                 |                                                                                   |                                                                                   | VF/VF 130/210_3200                                                                  | P90                                                                                 | BN90S6                                                                                  | 170                                                                                 |
| 0.29        | 4733     | 1.9 | 3200 | 52000    |                                                                                   |                                                                                   |                                                                                   | VF/VF 130/250_3200                                                                  | P90                                                                                 | BN90S6                                                                                  | 176                                                                                 |
| 0.36        | 4783     | 1.4 | 2560 | 34500    |                                                                                   |                                                                                   |                                                                                   | VF/VF 130/210_2560                                                                  | P90                                                                                 | BN90S6                                                                                  | 170                                                                                 |
| 0.36        | 4584     | 2.0 | 2560 | 52000    |                                                                                   |                                                                                   |                                                                                   | VF/VF 130/250_2560                                                                  | P90                                                                                 | BN90S6                                                                                  | 176                                                                                 |
| 0.44        | 3929     | 1.1 | 3200 | 19500    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/185_3200                                                                    | P80                                                                                 | BN80B4                                                                                  | 162                                                                                 |
| 0.50        | 4584     | 1.0 | 1840 | 19500    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/185_1840                                                                    | P90                                                                                 | BN90S6                                                                                  | 162                                                                                 |
| 0.50        | 4011     | 1.6 | 1840 | 34500    |                                                                                   |                                                                                   |                                                                                   | VF/VF 130/210_1840                                                                  | P90                                                                                 | BN90S6                                                                                  | 170                                                                                 |
| 0.50        | 4154     | 2.2 | 1840 | 52000    |                                                                                   |                                                                                   |                                                                                   | VF/VF 130/250_1840                                                                  | P90                                                                                 | BN90S6                                                                                  | 176                                                                                 |
| 0.55        | 3798     | 1.1 | 2560 | 19500    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/185_2560                                                                    | P80                                                                                 | BN80B4                                                                                  | 162                                                                                 |
| 0.76        | 3201     | 1.3 | 1840 | 19500    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/185_1840                                                                    | P80                                                                                 | BN80B4                                                                                  | 162                                                                                 |
| 0.88        | 2865     | 1.5 | 1600 | 19500    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/185_1600                                                                    | P80                                                                                 | BN80B4                                                                                  | 162                                                                                 |
| 1.0         | 2722     | 1.6 | 920  | 19500    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/185_920                                                                     | P90                                                                                 | BN90S6                                                                                  | 162                                                                                 |
| 1.2         | 2087     | 0.9 | 1200 | 13800    |                                                                                   |                                                                                   |                                                                                   | W/VF 63/130_1200                                                                    | P80                                                                                 | BN80B4                                                                                  | 146                                                                                 |
| 1.2         | 2087     | 2.0 | 1200 | 19500    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/185_1200                                                                    | P80                                                                                 | BN80B4                                                                                  | 162                                                                                 |
| 1.3         | 2525     | 1.1 | 690  | 16000    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/150_690                                                                     | P90                                                                                 | BN90S6                                                                                  | 154                                                                                 |
| 1.5         | 1817     | 1.0 | 960  | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_960                                                                     | P80                                                                                 | BN80B4                                                                                  | 146                                                                                 |
| 1.5         | 2118     | 1.2 | 920  | 16000    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/150_920                                                                     | P80                                                                                 | BN80B4                                                                                  | 154                                                                                 |
| 1.5         | 1977     | 2.1 | 920  | 19500    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/185_920                                                                     | P80                                                                                 | BN80B4                                                                                  | 162                                                                                 |
| 1.7         | 2142     | 1.3 | 529  | 16000    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/150_529                                                                     | P90                                                                                 | BN90S6                                                                                  | 154                                                                                 |
| 1.8         | 1760     | 2.4 | 800  | 19500    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/185_800                                                                     | P80                                                                                 | BN80B4                                                                                  | 162                                                                                 |
| 1.8         | 1516     | 1.2 | 760  | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_760                                                                     | P80                                                                                 | BN80B4                                                                                  | 146                                                                                 |
| 2.0         | 1765     | 1.5 | 690  | 16000    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/150_690                                                                     | P80                                                                                 | BN80B4                                                                                  | 154                                                                                 |
| 2.3         | 1228     | 1.5 | 600  | 13800    |                                                                                   |                                                                                   |                                                                                   | W/VF 63/130_600                                                                     | P80                                                                                 | BN80B4                                                                                  | 146                                                                                 |
| 2.3         | 1381     | 3.0 | 600  | 19500    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/185_600                                                                     | P80                                                                                 | BN80B4                                                                                  | 162                                                                                 |
| 2.6         | 1489     | 1.7 | 529  | 16000    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/150_529                                                                     | P80                                                                                 | BN80B4                                                                                  | 154                                                                                 |
| 3.0         | 1294     | 2.0 | 460  | 16000    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/150_460                                                                     | P80                                                                                 | BN80B4                                                                                  | 154                                                                                 |
| 3.1         | 1144     | 0.9 | 300  | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_300                                                                         | P90                                                                                 | BN90S6                                                                                  | 144                                                                                 |
| 3.1         | 1167     | 1.2 | 300  | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_300                                                                         | P90                                                                                 | BN90S6                                                                                  | 152                                                                                 |
| 3.1         | 1168     | 2.1 | 300  | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_300                                                                         | P90                                                                                 | BN90S6                                                                                  | 160                                                                                 |
| 3.5         | 921      | 1.1 | 400  | 8000     |                                                                                   |                                                                                   |                                                                                   | VF/W 49/110_400                                                                     | P80                                                                                 | BN80B4                                                                                  | 141                                                                                 |
| 3.5         | 900      | 2.0 | 400  | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_400                                                                     | P80                                                                                 | BN80B4                                                                                  | 146                                                                                 |
| 3.8         | 1009     | 1.2 | 240  | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_240                                                                         | P90                                                                                 | BN90S6                                                                                  | 144                                                                                 |
| 3.8         | 1009     | 1.7 | 240  | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_240                                                                         | P90                                                                                 | BN90S6                                                                                  | 152                                                                                 |
| 3.8         | 1009     | 2.8 | 240  | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_240                                                                         | P90                                                                                 | BN90S6                                                                                  | 160                                                                                 |
| 4.1         | 1024     | 2.5 | 345  | 16000    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/150_345                                                                     | P80                                                                                 | BN80B4                                                                                  | 154                                                                                 |
| 4.7         | 813      | 1.1 | 300  | 13800    | —                                                                                 |                                                                                   |                                                                                   | VFR 130_300                                                                         | P80                                                                                 | BN80B4                                                                                  | 144                                                                                 |
| 4.7         | 737      | 1.4 | 300  | 8000     |                                                                                   |                                                                                   |                                                                                   | VF/W 49/110_300                                                                     | P80                                                                                 | BN80B4                                                                                  | 141                                                                                 |
| 4.7         | 890      | 2.9 | 300  | 16000    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/150_300                                                                     | P80                                                                                 | BN80B4                                                                                  | 154                                                                                 |
| 4.8         | 882      | 2.2 | 192  | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_192                                                                         | P90                                                                                 | BN90S6                                                                                  | 152                                                                                 |
| 5.0         | 716      | 2.5 | 280  | 13800    |                                                                                   |                                                                                   |                                                                                   | W/VF 63/130_280                                                                     | P80                                                                                 | BN80B4                                                                                  | 146                                                                                 |
| 5.5         | 785      | 1.0 | 168  | 8000     | —                                                                                 |                                                                                   |                                                                                   | WR 110_168                                                                          | P90                                                                                 | BN90S6                                                                                  | 140                                                                                 |
| 5.5         | 798      | 2.4 | 168  | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_168                                                                         | P90                                                                                 | BN90S6                                                                                  | 152                                                                                 |
| 5.8         | 700      | 1.6 | 240  | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_240                                                                         | P80                                                                                 | BN80B4                                                                                  | 144                                                                                 |
| 6.1         | 612      | 1.6 | 230  | 8000     |                                                                                   |                                                                                   |                                                                                   | VF/W 49/110_230                                                                     | P80                                                                                 | BN80B4                                                                                  | 141                                                                                 |
| 6.7         | 677      | 1.2 | 138  | 8000     |                                                                                   |                                                                                   |                                                                                   | WR 110_138                                                                          | P90                                                                                 | BN90S6                                                                                  | 140                                                                                 |
| 6.7         | 688      | 2.2 | 138  | 13800    | —                                                                                 |                                                                                   |                                                                                   | VFR 130_138                                                                         | P90                                                                                 | BN90S6                                                                                  | 144                                                                                 |
| 6.7         | 688      | 3.2 | 138  | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_138                                                                         | P90                                                                                 | BN90S6                                                                                  | 152                                                                                 |
| 7.3         | 589      | 1.1 | 192  | 8000     |                                                                                   |                                                                                   |                                                                                   | WR 110_192                                                                          | P80                                                                                 | BN80B4                                                                                  | 140                                                                                 |
| 7.3         | 599      | 2.0 | 192  | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_192                                                                         | P80                                                                                 | BN80B4                                                                                  | 144                                                                                 |
| 8.3         | 541      | 1.3 | 168  | 8000     |                                                                                   |                                                                                   |                                                                                   | WR 110_168                                                                          | P80                                                                                 | BN80B4                                                                                  | 140                                                                                 |
| 8.3         | 550      | 2.2 | 168  | 13800    | W 110_100 S2                                                                      | M2SB6                                                                             | 138                                                                               | VFR 130_168                                                                         | P80                                                                                 | BN80B4                                                                                  | 144                                                                                 |
| 9.2         | 444      | 1.1 | 100  | 8000     |                                                                                   |                                                                                   |                                                                                   | W 110_100                                                                           | P90                                                                                 | BN90S6                                                                                  | 139                                                                                 |
| 9.2         | 459      | 1.7 | 100  | 13200    |                                                                                   |                                                                                   |                                                                                   | VF 130_100                                                                          | P90                                                                                 | BN90S6                                                                                  | 142                                                                                 |
| 10.1        | 445      | 0.9 | 138  | 7000     |                                                                                   |                                                                                   |                                                                                   | WR 86_138                                                                           | P80                                                                                 | BN80B4                                                                                  | 136                                                                                 |
| 10.1        | 466      | 1.5 | 138  | 8000     |                                                                                   |                                                                                   |                                                                                   | WR 110_138                                                                          | P80                                                                                 | BN80B4                                                                                  | 140                                                                                 |
| 10.1        | 473      | 2.9 | 138  | 13800    | W 110_80 S2                                                                       | M2SB6                                                                             | 138                                                                               | VFR 130_138                                                                         | P80                                                                                 | BN80B4                                                                                  | 144                                                                                 |
| 11.5        | 411      | 1.1 | 80   | 8000     |                                                                                   |                                                                                   |                                                                                   | W 110_80                                                                            | P90                                                                                 | BN90S6                                                                                  | 139                                                                                 |
| 11.5        | 399      | 2.4 | 80   | 13200    |                                                                                   |                                                                                   |                                                                                   | VF 130_80                                                                           | P90                                                                                 | BN90S6                                                                                  | 142                                                                                 |
| 11.7        | 405      | 1.0 | 120  | 7000     |                                                                                   |                                                                                   |                                                                                   | WR 86_120                                                                           | P80                                                                                 | BN80B4                                                                                  | 136                                                                                 |
| 11.7        | 417      | 1.9 | 120  | 8000     |                                                                                   |                                                                                   |                                                                                   | WR 110_120                                                                          | P80                                                                                 | BN80B4                                                                                  | 140                                                                                 |
| 11.7        | 411      | 3.4 | 120  | 13800    | W 110_100 S2                                                                      | M2SA4                                                                             | 138                                                                               | VFR 130_120                                                                         | P80                                                                                 | BN80B4                                                                                  | 144                                                                                 |
| 13.3        | 403      | 1.9 | 69   | 8000     |                                                                                   |                                                                                   |                                                                                   | WR 110_69                                                                           | P90                                                                                 | BN90S6                                                                                  | 140                                                                                 |
| 14.0        | 317      | 1.5 | 100  | 8000     |                                                                                   |                                                                                   |                                                                                   | W 110_100                                                                           | P80                                                                                 | BN80B4                                                                                  | 139                                                                                 |
| 14.4        | 314      | 1.0 | 64   | 7000     |                                                                                   |                                                                                   |                                                                                   | W 86_64 S2                                                                          | P90                                                                                 | BN90S6                                                                                  | 135                                                                                 |
| 14.4        | 339      | 3.1 | 64   | 13200    |                                                                                   |                                                                                   |                                                                                   | VF 130_64                                                                           | P90                                                                                 | BN90S6                                                                                  | 142                                                                                 |

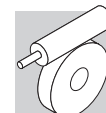


## 0.75 kW

| n2<br>min-1 | M2<br>Nm | S   | i  | Rn2<br>N |  |  |  |  |  | IEC  |  |     |
|-------------|----------|-----|----|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|
| 15.6        | 318      | 1.0 | 90 | 6200     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | WR 75_90                                                                            | P80                                                                                     | BN80B4                                                                              | 132 |
| 15.6        | 308      | 1.4 | 90 | 7000     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | WR 86_90                                                                            | P80                                                                                     | BN80B4                                                                              | 136 |
| 15.6        | 322      | 2.6 | 90 | 8000     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | WR 110_90                                                                           | P80                                                                                     | BN80B4                                                                              | 140 |
| 16.4        | 288      | 1.1 | 56 | 7000     | W 86_56                                                                           | S2                                                                                | M2SB6                                                                             | 134                                                                                 | W 86_56                                                                             | P90                                                                                     | BN90S6                                                                              | 135 |
| 16.4        | 296      | 2.2 | 56 | 8000     | W 110_56                                                                          | S2                                                                                | M2SB6                                                                             | 138                                                                                 | W 110_56                                                                            | P90                                                                                     | BN90S6                                                                              | 139 |
| 17.5        | 262      | 1.0 | 80 | 7000     | W 86_80                                                                           | S2                                                                                | M2SA4                                                                             | 134                                                                                 | W 86_80                                                                             | P80                                                                                     | BN80B4                                                                              | 135 |
| 17.5        | 270      | 1.7 | 80 | 8000     | W 110_80                                                                          | S2                                                                                | M2SA4                                                                             | 138                                                                                 | W 110_80                                                                            | P80                                                                                     | BN80B4                                                                              | 139 |
| 18.4        | 245      | 1.0 | 50 | 6200     | W 75_50                                                                           | S2                                                                                | M2SB6                                                                             | 130                                                                                 | W 75_50                                                                             | P90                                                                                     | BN90S6                                                                              | 131 |
| 18.7        | 280      | 1.1 | 75 | 5980     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | WR 75_75                                                                            | P80                                                                                     | BN80B4                                                                              | 132 |
| 20.3        | 265      | 1.4 | 69 | 7000     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | WR 86_69                                                                            | P80                                                                                     | BN80B4                                                                              | 136 |
| 20.3        | 272      | 2.4 | 69 | 8000     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | WR 110_69                                                                           | P80                                                                                     | BN80B4                                                                              | 140 |
| 20.4        | 273      | 1.3 | 45 | 6010     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | WR 75_45                                                                            | P90                                                                                     | BN90S6                                                                              | 132 |
| 21.9        | 223      | 1.3 | 64 | 7000     | W 86_64                                                                           | S2                                                                                | M2SA4                                                                             | 134                                                                                 | W 86_64                                                                             | P80                                                                                     | BN80B4                                                                              | 135 |
| 21.9        | 229      | 2.3 | 64 | 8000     | W 110_64                                                                          | S2                                                                                | M2SA4                                                                             | 138                                                                                 | W 110_64                                                                            | P80                                                                                     | BN80B4                                                                              | 139 |
| 23.0        | 212      | 1.3 | 40 | 5930     | W 75_40                                                                           | S2                                                                                | M2SB6                                                                             | 130                                                                                 | W 75_40                                                                             | P90                                                                                     | BN90S6                                                                              | 131 |
| 23.3        | 200      | 1.0 | 60 | 5960     | W 75_60                                                                           | S2                                                                                | M2SA4                                                                             | 130                                                                                 | W 75_60                                                                             | P80                                                                                     | BN80B4                                                                              | 131 |
| 23.3        | 236      | 1.2 | 60 | 5640     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | WR 75_60                                                                            | P80                                                                                     | BN80B4                                                                              | 132 |
| 23.3        | 236      | 1.6 | 60 | 7000     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | WR 86_60                                                                            | P80                                                                                     | BN80B4                                                                              | 136 |
| 23.3        | 243      | 2.8 | 60 | 8000     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | WR 110_60                                                                           | P80                                                                                     | BN80B4                                                                              | 140 |
| 25.0        | 201      | 1.5 | 56 | 7000     | W 86_56                                                                           | S2                                                                                | M2SA4                                                                             | 134                                                                                 | W 86_56                                                                             | P80                                                                                     | BN80B4                                                                              | 135 |
| 25.0        | 206      | 2.9 | 56 | 8000     | W 110_56                                                                          | S2                                                                                | M2SA4                                                                             | 138                                                                                 | W 110_56                                                                            | P80                                                                                     | BN80B4                                                                              | 139 |
| 28.0        | 174      | 1.3 | 50 | 5670     | W 75_50                                                                           | S2                                                                                | M2SA4                                                                             | 130                                                                                 | W 75_50                                                                             | P80                                                                                     | BN80B4                                                                              | 131 |
| 30          | 172      | 2.0 | 46 | 7000     | W 86_46                                                                           | S2                                                                                | M2SA4                                                                             | 134                                                                                 | W 86_46                                                                             | P80                                                                                     | BN80B4                                                                              | 135 |
| 30          | 174      | 3.4 | 46 | 8000     | W 110_46                                                                          | S2                                                                                | M2SA4                                                                             | 138                                                                                 | W 110_46                                                                            | P80                                                                                     | BN80B4                                                                              | 139 |
| 31          | 154      | 0.9 | 45 | 3860     | W 63_45                                                                           | S2                                                                                | M2SA4                                                                             | 126                                                                                 | W 63_45                                                                             | P80                                                                                     | BN80B4                                                                              | 127 |
| 31          | 184      | 1.6 | 45 | 5250     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | WR 75_45                                                                            | P80                                                                                     | BN80B4                                                                              | 132 |
| 31          | 180      | 2.2 | 45 | 7000     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | WR 86_45                                                                            | P80                                                                                     | BN80B4                                                                              | 136 |
| 35          | 147      | 1.7 | 40 | 5370     | W 75_40                                                                           | S2                                                                                | M2SA4                                                                             | 130                                                                                 | W 75_40                                                                             | P80                                                                                     | BN80B4                                                                              | 131 |
| 35          | 153      | 2.2 | 40 | 7000     | W 86_40                                                                           | S2                                                                                | M2SA4                                                                             | 134                                                                                 | W 86_40                                                                             | P80                                                                                     | BN80B4                                                                              | 135 |
| 37          | 136      | 1.1 | 38 | 3700     | W 63_38                                                                           | S2                                                                                | M2SA4                                                                             | 126                                                                                 | W 63_38                                                                             | P80                                                                                     | BN80B4                                                                              | 127 |
| 40          | 143      | 2.4 | 23 | 7000     | W 86_23                                                                           | S2                                                                                | M2SB6                                                                             | 134                                                                                 | W 86_23                                                                             | P90                                                                                     | BN90S6                                                                              | 135 |
| 47          | 114      | 1.4 | 30 | 3490     | W 63_30                                                                           | S2                                                                                | M2SA4                                                                             | 126                                                                                 | W 63_30                                                                             | P80                                                                                     | BN80B4                                                                              | 127 |
| 47          | 129      | 2.1 | 30 | 4680     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | WR 75_30                                                                            | P80                                                                                     | BN80B4                                                                              | 132 |
| 47          | 118      | 2.3 | 30 | 4950     | W 75_30                                                                           | S2                                                                                | M2SA4                                                                             | 130                                                                                 | W 75_30                                                                             | P80                                                                                     | BN80B4                                                                              | 131 |
| 47          | 117      | 3.2 | 30 | 7000     | W 86_30                                                                           | S2                                                                                | M2SA4                                                                             | 134                                                                                 | W 86_30                                                                             | P80                                                                                     | BN80B4                                                                              | 135 |
| 56          | 102      | 2.4 | 25 | 4700     | W 75_25                                                                           | S2                                                                                | M2SA4                                                                             | 130                                                                                 | W 75_25                                                                             | P80                                                                                     | BN80B4                                                                              | 131 |
| 58          | 96       | 1.6 | 24 | 3290     | W 63_24                                                                           | S2                                                                                | M2SA4                                                                             | 126                                                                                 | W 63_24                                                                             | P80                                                                                     | BN80B4                                                                              | 127 |
| 61          | 96       | 3.3 | 23 | 7000     | W 86_23                                                                           | S2                                                                                | M2SA4                                                                             | 134                                                                                 | W 86_23                                                                             | P80                                                                                     | BN80B4                                                                              | 135 |
| 70          | 85       | 2.9 | 20 | 4400     | W 75_20                                                                           | S2                                                                                | M2SA4                                                                             | 130                                                                                 | W 75_20                                                                             | P80                                                                                     | BN80B4                                                                              | 131 |
| 74          | 79       | 1.9 | 19 | 3100     | W 63_19                                                                           | S2                                                                                | M2SA4                                                                             | 126                                                                                 | W 63_19                                                                             | P80                                                                                     | BN80B4                                                                              | 127 |
| 93          | 64       | 2.4 | 15 | 2910     | W 63_15                                                                           | S2                                                                                | M2SA4                                                                             | 126                                                                                 | W 63_15                                                                             | P80                                                                                     | BN80B4                                                                              | 127 |
| 100         | 58       | 1.1 | 14 | 1690     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | VF 49_14                                                                            | P80                                                                                     | BN80B4                                                                              | 120 |
| 117         | 49       | 1.0 | 24 | 1710     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | VF 49_24                                                                            | P80                                                                                     | BN80A2                                                                              | 120 |
| 117         | 52       | 2.7 | 12 | 2740     | W 63_12                                                                           | S2                                                                                | M2SA4                                                                             | 126                                                                                 | W 63_12                                                                             | P80                                                                                     | BN80B4                                                                              | 127 |
| 131         | 47       | 2.7 | 7  | 2590     | W 63_7                                                                            | S2                                                                                | M2SB6                                                                             | 126                                                                                 | W 63_7                                                                              | P90                                                                                     | BN90S6                                                                              | 127 |
| 140         | 43       | 1.4 | 10 | 1540     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | VF 49_10                                                                            | P80                                                                                     | BN80B4                                                                              | 120 |
| 140         | 44       | 3.2 | 10 | 2600     | W 63_10                                                                           | S2                                                                                | M2SA4                                                                             | 126                                                                                 | W 63_10                                                                             | P80                                                                                     | BN80B4                                                                              | 127 |
| 187         | 33       | 3.8 | 15 | 2440     | W 63_15                                                                           | S1                                                                                | M1LA2                                                                             | 126                                                                                 | W 63_15                                                                             | P80                                                                                     | BN80A2                                                                              | 127 |
| 200         | 31       | 1.8 | 7  | 1400     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | VF 49_7                                                                             | P80                                                                                     | BN80B4                                                                              | 120 |
| 200         | 32       | 3.8 | 7  | 2340     | W 63_7                                                                            | S2                                                                                | M2SA4                                                                             | 126                                                                                 | W 63_7                                                                              | P80                                                                                     | BN80B4                                                                              | 127 |
| 280         | 22       | 2.0 | 10 | 1340     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | VF 49_10                                                                            | P80                                                                                     | BN80A2                                                                              | 120 |
| 400         | 16       | 2.6 | 7  | 1200     |                                                                                   | —                                                                                 |                                                                                   |                                                                                     | VF 49_7                                                                             | P80                                                                                     | BN80A2                                                                              | 120 |

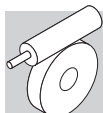
## 1.1 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i    | Rn <sub>2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|------|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 0.29                                | 7308                 | 0.9 | 3200 | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_3200                                                                    | P90                                                                                   | BN90L6                                                                                    | 170                                                                                   |
| 0.29                                | 6942                 | 1.3 | 3200 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_3200                                                                    | P90                                                                                   | BN90L6                                                                                    | 176                                                                                   |
| 0.36                                | 7016                 | 0.9 | 2560 | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_2560                                                                    | P90                                                                                   | BN90L6                                                                                    | 170                                                                                   |
| 0.36                                | 6723                 | 1.4 | 2560 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_2560                                                                    | P90                                                                                   | BN90L6                                                                                    | 176                                                                                   |
| 0.44                                | 5283                 | 1.2 | 3200 | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_3200                                                                    | P90                                                                                   | BN90S4                                                                                    | 170                                                                                   |



## 1.1 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i    | Rn <sub>2</sub><br>N |              |       |     |                    | IEC        |     |
|-------------------------|----------------------|-----|------|----------------------|--------------|-------|-----|--------------------|------------|-----|
| 0.44                    | 5042                 | 1.8 | 3200 | 52000                | —            | —     | —   | VF/VF 130/250_3200 | P90 BN90S4 | 176 |
| 0.50                    | 7143                 | 0.9 | 1840 | 34500                | —            | —     | —   | VF/VF 130/210_1840 | P90 BN90L6 | 170 |
| 0.50                    | 6093                 | 1.5 | 1840 | 52000                | —            | —     | —   | VF/VF 130/250_1840 | P90 BN90L6 | 176 |
| 0.55                    | 4610                 | 1.4 | 2560 | 34500                | —            | —     | —   | VF/VF 130/210_2560 | P90 BN90S4 | 170 |
| 0.55                    | 4802                 | 1.9 | 2560 | 52000                | —            | —     | —   | VF/VF 130/250_2560 | P90 BN90S4 | 176 |
| 0.76                    | 4694                 | 0.9 | 1840 | 19500                | —            | —     | —   | W/VF 86/185_1840   | P90 BN90S4 | 162 |
| 0.76                    | 4832                 | 1.3 | 1840 | 34500                | —            | —     | —   | VF/VF 130/210_1840 | P90 BN90S4 | 170 |
| 0.76                    | 4280                 | 2.1 | 1840 | 52000                | —            | —     | —   | VF/VF 130/250_1840 | P90 BN90S4 | 176 |
| 0.88                    | 4202                 | 1.0 | 1600 | 19500                | —            | —     | —   | W/VF 86/185_1600   | P90 BN90S4 | 162 |
| 1.0                     | 3992                 | 1.1 | 920  | 19500                | —            | —     | —   | W/VF 86/185_920    | P90 BN90L6 | 162 |
| 1.2                     | 3061                 | 1.4 | 1200 | 19500                | —            | —     | —   | W/VF 86/185_1200   | P90 BN90S4 | 162 |
| 1.5                     | 2899                 | 1.4 | 920  | 19500                | —            | —     | —   | W/VF 86/185_920    | P90 BN90S4 | 162 |
| 1.8                     | 2581                 | 1.6 | 800  | 19500                | —            | —     | —   | W/VF 86/185_800    | P90 BN90S4 | 162 |
| 2.0                     | 2589                 | 1.0 | 690  | 16000                | —            | —     | —   | W/VF 86/150_690    | P90 BN90S4 | 154 |
| 2.3                     | 1801                 | 1.0 | 600  | 13800                | —            | —     | —   | W/VF 63/130_600    | P90 BN90S4 | 146 |
| 2.3                     | 2026                 | 2.1 | 600  | 19500                | —            | —     | —   | W/VF 86/185_600    | P90 BN90S4 | 162 |
| 2.6                     | 2183                 | 1.2 | 529  | 16000                | —            | —     | —   | W/VF 86/150_529    | P90 BN90S4 | 154 |
| 3.0                     | 1898                 | 1.4 | 460  | 16000                | —            | —     | —   | W/VF 86/150_460    | P90 BN90S4 | 154 |
| 3.1                     | 1713                 | 1.4 | 300  | 19500                | —            | —     | —   | VFR 185_300        | P90 BN90L6 | 160 |
| 3.5                     | 1321                 | 1.4 | 400  | 13800                | —            | —     | —   | W/VF 63/130_400    | P90 BN90S4 | 146 |
| 3.5                     | 1441                 | 2.9 | 400  | 19500                | —            | —     | —   | W/VF 86/185_400    | P90 BN90S4 | 162 |
| 3.8                     | 1480                 | 1.1 | 240  | 16000                | —            | —     | —   | VFR 150_240        | P90 BN90L6 | 152 |
| 3.8                     | 1480                 | 1.9 | 240  | 19500                | —            | —     | —   | VFR 185_240        | P90 BN90L6 | 160 |
| 4.1                     | 1501                 | 1.7 | 345  | 16000                | —            | —     | —   | W/VF 86/150_345    | P90 BN90S4 | 154 |
| 4.7                     | 1222                 | 1.1 | 300  | 16000                | —            | —     | —   | VFR 150_300        | P90 BN90S4 | 152 |
| 4.7                     | 1238                 | 1.9 | 300  | 19500                | —            | —     | —   | VFR 185_300        | P90 BN90S4 | 160 |
| 4.7                     | 1306                 | 2.0 | 300  | 16000                | —            | —     | —   | W/VF 86/150_300    | P90 BN90S4 | 154 |
| 4.8                     | 1272                 | 1.0 | 192  | 13800                | —            | —     | —   | VFR 130_192        | P90 BN90L6 | 144 |
| 5.0                     | 1051                 | 1.7 | 280  | 13800                | —            | —     | —   | W/VF 63/130_280    | P90 BN90S4 | 146 |
| 5.8                     | 1026                 | 1.1 | 240  | 13800                | —            | —     | —   | VFR 130_240        | P90 BN90S4 | 144 |
| 5.8                     | 1044                 | 1.5 | 240  | 16000                | —            | —     | —   | VFR 150_240        | P90 BN90S4 | 152 |
| 5.8                     | 1063                 | 2.6 | 240  | 19500                | —            | —     | —   | VFR 185_240        | P90 BN90S4 | 160 |
| 6.2                     | 1064                 | 2.4 | 225  | 16000                | —            | —     | —   | W/VF 86/150_225    | P90 BN90S4 | 154 |
| 6.7                     | 1008                 | 1.5 | 138  | 13800                | —            | —     | —   | VFR 130_138        | P90 BN90L6 | 144 |
| 6.7                     | 1008                 | 2.2 | 138  | 16000                | —            | —     | —   | VFR 150_138        | P90 BN90L6 | 152 |
| 7.0                     | 960                  | 2.7 | 200  | 16000                | —            | —     | —   | W/VF 86/150_200    | P90 BN90S4 | 154 |
| 7.3                     | 879                  | 1.4 | 192  | 13800                | —            | —     | —   | VFR 130_192        | P90 BN90S4 | 144 |
| 7.3                     | 893                  | 1.9 | 192  | 16000                | —            | —     | —   | VFR 150_192        | P90 BN90S4 | 152 |
| 7.7                     | 891                  | 1.0 | 120  | 8000                 | —            | —     | —   | WR 110_120         | P90 BN90L6 | 140 |
| 7.8                     | 878                  | 3.4 | 180  | 19500                | —            | —     | —   | VFR 185_180        | P90 BN90S4 | 160 |
| 8.3                     | 807                  | 1.5 | 168  | 13800                | —            | —     | —   | VFR 130_168        | P90 BN90S4 | 144 |
| 8.3                     | 819                  | 2.1 | 168  | 16000                | —            | —     | —   | VFR 150_168        | P90 BN90S4 | 152 |
| 9.2                     | 674                  | 1.2 | 100  | 13200                | —            | —     | —   | VF 130_100         | P90 BN90L6 | 142 |
| 10.1                    | 683                  | 1.0 | 138  | 8000                 | —            | —     | —   | WR 110_138         | P90 BN90S4 | 140 |
| 10.1                    | 694                  | 1.9 | 138  | 13800                | —            | —     | —   | VFR 130_138        | P90 BN90S4 | 144 |
| 10.1                    | 704                  | 2.8 | 138  | 16000                | —            | —     | —   | VFR 150_138        | P90 BN90S4 | 152 |
| 10.2                    | 678                  | 1.3 | 90   | 8000                 | —            | —     | —   | WR 110_90          | P90 BN90L6 | 140 |
| 11.5                    | 585                  | 1.6 | 80   | 13200                | —            | —     | —   | VF 130_80          | P90 BN90L6 | 142 |
| 11.7                    | 612                  | 1.3 | 120  | 8000                 | —            | —     | —   | WR 110_120         | P90 BN90S4 | 140 |
| 11.7                    | 603                  | 2.3 | 120  | 13800                | —            | —     | —   | VFR 130_120        | P90 BN90S4 | 144 |
| 11.7                    | 612                  | 3.3 | 120  | 16000                | —            | —     | —   | VFR 150_120        | P90 BN90S4 | 152 |
| 14.0                    | 465                  | 1.0 | 100  | 8000                 | W 110_100 S2 | M2SB4 | 138 | W 110_100          | P90 BN90S4 | 139 |
| 14.0                    | 525                  | 1.1 | 100  | 12600                | —            | —     | —   | VF 130_100         | P90 BN90S4 | 142 |
| 15.6                    | 473                  | 1.8 | 90   | 8000                 | —            | —     | —   | WR 110_90          | P90 BN90S4 | 140 |
| 15.6                    | 479                  | 3.1 | 90   | 13800                | —            | —     | —   | VFR 130_90         | P90 BN90S4 | 144 |
| 17.5                    | 396                  | 1.2 | 80   | 8000                 | W 110_80 S2  | M2SB4 | 138 | W 110_80           | P90 BN90S4 | 139 |
| 17.5                    | 408                  | 2.2 | 80   | 12600                | —            | —     | —   | VF 130_80          | P90 BN90S4 | 142 |
| 20.0                    | 362                  | 1.0 | 46   | 7000                 | W 86_46 S3   | M3SA6 | 134 | W 86_46            | P90 BN90L6 | 135 |
| 20.0                    | 383                  | 3.0 | 46   | 13200                | —            | —     | —   | VF 130_46          | P90 BN90L6 | 142 |
| 20.3                    | 388                  | 1.0 | 69   | 7000                 | —            | —     | —   | WR 86_69           | P90 BN90S4 | 136 |
| 20.3                    | 399                  | 1.6 | 69   | 8000                 | —            | —     | —   | WR 110_69          | P90 BN90S4 | 140 |
| 20.3                    | 393                  | 3.3 | 69   | 13800                | —            | —     | —   | VFR 130_69         | P90 BN90S4 | 144 |
| 21.9                    | 336                  | 1.6 | 64   | 8000                 | W 110_64 S2  | M2SB4 | 138 | W 110_64           | P90 BN90S4 | 139 |
| 21.9                    | 341                  | 2.7 | 64   | 12600                | —            | —     | —   | VF 130_64          | P90 BN90S4 | 142 |
| 23.0                    | 324                  | 1.1 | 40   | 7000                 | W 86_40 S3   | M3SA6 | 134 | W 86_40            | P90 BN90L6 | 135 |

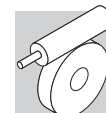


## 1.1 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i    | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |     |
|-------------------------|----------------------|-----|------|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|
| 23.3                    | 347                  | 1.1 | 60   | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_60                                                                            | P90                                                                                 | BN90S4                                                                                  | 136                                                                                 |     |
| 23.3                    | 356                  | 1.9 | 60   | 8000                 |                                                                                   | —                                                                                 |                                                                                   | WR 110_60                                                                           | P90                                                                                 | BN90S4                                                                                  | 140                                                                                 |     |
| 25.0                    | 294                  | 1.0 | 56   | 7000                 | W 86_56                                                                           | S2                                                                                | M2SB4                                                                             | 134                                                                                 | W 86_56                                                                             | P90                                                                                     | BN90S4                                                                              | 135 |
| 25.0                    | 303                  | 2.0 | 56   | 8000                 | W 110_56                                                                          | S2                                                                                | M2SB4                                                                             | 138                                                                                 | W 110_56                                                                            | P90                                                                                     | BN90S4                                                                              | 139 |
| 25.0                    | 307                  | 3.1 | 56   | 12600                |                                                                                   | —                                                                                 |                                                                                   | VF 130_56                                                                           | P90                                                                                 | BN90S4                                                                                  | 142                                                                                 |     |
| 30                      | 252                  | 1.3 | 46   | 7000                 | W 86_46                                                                           | S2                                                                                | M2SB4                                                                             | 134                                                                                 | W 86_46                                                                             | P90                                                                                     | BN90S4                                                                              | 135 |
| 30                      | 255                  | 2.3 | 46   | 8000                 | W 110_46                                                                          | S2                                                                                | M2SB4                                                                             | 138                                                                                 | W 110_46                                                                            | P90                                                                                     | BN90S4                                                                              | 139 |
| 31                      | 270                  | 1.1 | 45   | 5010                 |                                                                                   | —                                                                                 |                                                                                   | WR 75_45                                                                            | P90                                                                                 | BN90S4                                                                                  | 132                                                                                 |     |
| 31                      | 263                  | 1.5 | 45   | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_45                                                                            | P90                                                                                 | BN90S4                                                                                  | 136                                                                                 |     |
| 31                      | 270                  | 2.6 | 45   | 8000                 |                                                                                   | —                                                                                 |                                                                                   | WR 110_45                                                                           | P90                                                                                 | BN90S4                                                                                  | 140                                                                                 |     |
| 35                      | 216                  | 1.2 | 40   | 4980                 | W 75_40                                                                           | S2                                                                                | M2SB4                                                                             | 130                                                                                 | W 75_40                                                                             | P90                                                                                     | BN90S4                                                                              | 131 |
| 35                      | 225                  | 1.5 | 40   | 7000                 | W 86_40                                                                           | S2                                                                                | M2SB4                                                                             | 134                                                                                 | W 86_40                                                                             | P90                                                                                     | BN90S4                                                                              | 135 |
| 35                      | 228                  | 2.9 | 40   | 8000                 | W 110_40                                                                          | S2                                                                                | M2SB4                                                                             | 138                                                                                 | W 110_40                                                                            | P90                                                                                     | BN90S4                                                                              | 139 |
| 37                      | 217                  | 1.2 | 37.5 | 4790                 |                                                                                   | —                                                                                 |                                                                                   | WR 75_37.5                                                                          | P90                                                                                 | BN90S4                                                                                  | 132                                                                                 |     |
| 40                      | 210                  | 1.6 | 23   | 7000                 | W 86_23                                                                           | S3                                                                                | M3SA6                                                                             | 134                                                                                 | W 86_23                                                                             | P90                                                                                     | BN90L6                                                                              | 135 |
| 41                      | 207                  | 1.7 | 34.5 | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_34.5                                                                          | P90                                                                                 | BN90S4                                                                                  | 136                                                                                 |     |
| 47                      | 167                  | 1.0 | 30   | 3130                 | W 63_30                                                                           | S2                                                                                | M2SB4                                                                             | 126                                                                                 | W 63_30                                                                             | P90                                                                                     | BN90S4                                                                              | 127 |
| 47                      | 189                  | 1.5 | 30   | 4530                 |                                                                                   | —                                                                                 |                                                                                   | WR 75_30                                                                            | P90                                                                                 | BN90S4                                                                                  | 132                                                                                 |     |
| 47                      | 173                  | 1.6 | 30   | 4640                 | W 75_30                                                                           | S2                                                                                | M2SB4                                                                             | 130                                                                                 | W 75_30                                                                             | P90                                                                                     | BN90S4                                                                              | 131 |
| 47                      | 185                  | 1.9 | 30   | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_30                                                                            | P90                                                                                 | BN90S4                                                                                  | 136                                                                                 |     |
| 47                      | 171                  | 2.2 | 30   | 7000                 | W 86_30                                                                           | S2                                                                                | M2SB4                                                                             | 134                                                                                 | W 86_30                                                                             | P90                                                                                     | BN90S4                                                                              | 135 |
| 56                      | 150                  | 1.7 | 25   | 4420                 | W 75_25                                                                           | S2                                                                                | M2SB4                                                                             | 130                                                                                 | W 75_25                                                                             | P90                                                                                     | BN90S4                                                                              | 131 |
| 58                      | 140                  | 1.1 | 24   | 2990                 | W 63_24                                                                           | S2                                                                                | M2SB4                                                                             | 126                                                                                 | W 63_24                                                                             | P90                                                                                     | BN90S4                                                                              | 127 |
| 61                      | 142                  | 2.3 | 23   | 7000                 | W 86_23                                                                           | S2                                                                                | M2SB4                                                                             | 134                                                                                 | W 86_23                                                                             | P90                                                                                     | BN90S4                                                                              | 135 |
| 70                      | 125                  | 2.0 | 20   | 4160                 | W 75_20                                                                           | S2                                                                                | M2SB4                                                                             | 130                                                                                 | W 75_20                                                                             | P90                                                                                     | BN90S4                                                                              | 131 |
| 70                      | 126                  | 2.5 | 20   | 7000                 | W 86_20                                                                           | S2                                                                                | M2SB4                                                                             | 134                                                                                 | W 86_20                                                                             | P90                                                                                     | BN90S4                                                                              | 135 |
| 74                      | 115                  | 1.3 | 19   | 2840                 | W 63_19                                                                           | S2                                                                                | M2SB4                                                                             | 126                                                                                 | W 63_19                                                                             | P90                                                                                     | BN90S4                                                                              | 127 |
| 93                      | 93                   | 1.6 | 15   | 2690                 | W 63_15                                                                           | S2                                                                                | M2SB4                                                                             | 126                                                                                 | W 63_15                                                                             | P90                                                                                     | BN90S4                                                                              | 127 |
| 93                      | 96                   | 2.6 | 15   | 3850                 | W 75_15                                                                           | S2                                                                                | M2SB4                                                                             | 130                                                                                 | W 75_15                                                                             | P90                                                                                     | BN90S4                                                                              | 131 |
| 93                      | 96                   | 3.4 | 15   | 6820                 | W 86_15                                                                           | S2                                                                                | M2SB4                                                                             | 134                                                                                 | W 86_15                                                                             | P90                                                                                     | BN90S4                                                                              | 135 |
| 117                     | 77                   | 1.8 | 12   | 2550                 | W 63_12                                                                           | S2                                                                                | M2SB4                                                                             | 126                                                                                 | W 63_12                                                                             | P90                                                                                     | BN90S4                                                                              | 127 |
| 140                     | 65                   | 2.2 | 10   | 2440                 | W 63_10                                                                           | S2                                                                                | M2SB4                                                                             | 126                                                                                 | W 63_10                                                                             | P90                                                                                     | BN90S4                                                                              | 127 |
| 140                     | 66                   | 3.5 | 10   | 3420                 | W 75_10                                                                           | S2                                                                                | M2SB4                                                                             | 130                                                                                 | W 75_10                                                                             | P90                                                                                     | BN90S4                                                                              | 131 |
| 187                     | 48                   | 2.6 | 15   | 2330                 | W 63_15                                                                           | S2                                                                                | M2SA2                                                                             | 126                                                                                 | W 63_15                                                                             | P80                                                                                     | BN80B2                                                                              | 127 |
| 200                     | 44                   | 1.1 | 14   | 1370                 |                                                                                   | —                                                                                 |                                                                                   | VF 49_14                                                                            | P80                                                                                 | BN80B2                                                                                  | 120                                                                                 |     |
| 200                     | 46                   | 2.6 | 7    | 2210                 | W 63_7                                                                            | S2                                                                                | M2SB4                                                                             | 126                                                                                 | W 63_7                                                                              | P90                                                                                     | BN90S4                                                                              | 127 |
| 233                     | 39                   | 3.2 | 12   | 2190                 | W 63_12                                                                           | S2                                                                                | M2SA2                                                                             | 126                                                                                 | W 63_12                                                                             | P80                                                                                     | BN80B2                                                                              | 127 |
| 280                     | 32                   | 1.4 | 10   | 1250                 |                                                                                   | —                                                                                 |                                                                                   | VF 49_10                                                                            | P80                                                                                 | BN80B2                                                                                  | 120                                                                                 |     |
| 280                     | 33                   | 3.8 | 10   | 2080                 | W 63_10                                                                           | S2                                                                                | M2SA2                                                                             | 126                                                                                 | W 63_10                                                                             | P80                                                                                     | BN80B2                                                                              | 127 |
| 400                     | 23                   | 1.8 | 7    | 1130                 |                                                                                   | —                                                                                 |                                                                                   | VF 49_7                                                                             | P80                                                                                 | BN80B2                                                                                  | 120                                                                                 |     |

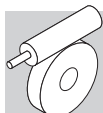
## 1.5 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i    | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|------|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 0.29                    | 9266                 | 1.0 | 3200 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_3200                                                                    | P100                                                                                  | BN100LA6                                                                                  | 176                                                                                   |
| 0.37                    | 8973                 | 1.0 | 2560 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_2560                                                                    | P100                                                                                  | BN100LA6                                                                                  | 176                                                                                   |
| 0.44                    | 7152                 | 0.9 | 3200 | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_3200                                                                    | P90                                                                                   | BN90LA4                                                                                   | 170                                                                                   |
| 0.44                    | 6827                 | 1.3 | 3200 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_3200                                                                    | P90                                                                                   | BN90LA4                                                                                   | 176                                                                                   |
| 0.51                    | 8132                 | 1.1 | 1840 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_1840                                                                    | P100                                                                                  | BN100LA6                                                                                  | 176                                                                                   |
| 0.55                    | 6242                 | 1.0 | 2560 | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_2560                                                                    | P90                                                                                   | BN90LA4                                                                                   | 170                                                                                   |
| 0.55                    | 6502                 | 1.4 | 2560 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_2560                                                                    | P90                                                                                   | BN90LA4                                                                                   | 176                                                                                   |
| 0.77                    | 6543                 | 1.0 | 1840 | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_1840                                                                    | P90                                                                                   | BN90LA4                                                                                   | 170                                                                                   |
| 0.77                    | 5795                 | 1.6 | 1840 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_1840                                                                    | P90                                                                                   | BN90LA4                                                                                   | 176                                                                                   |
| 1.0                     | 4907                 | 1.3 | 920  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_920                                                                     | P100                                                                                  | BN100LA6                                                                                  | 170                                                                                   |
| 1.0                     | 4907                 | 1.9 | 920  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_920                                                                     | P100                                                                                  | BN100LA6                                                                                  | 176                                                                                   |
| 1.2                     | 4145                 | 1.0 | 1200 | 19500                | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 86/185_1200                                                                      | P90                                                                                   | BN90LA4                                                                                   | 162                                                                                   |
| 1.2                     | 4633                 | 1.4 | 800  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_800                                                                     | P100                                                                                  | BN100LA6                                                                                  | 170                                                                                   |
| 1.2                     | 4877                 | 1.9 | 800  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_800                                                                     | P100                                                                                  | BN100LA6                                                                                  | 176                                                                                   |
| 1.5                     | 3926                 | 1.1 | 920  | 19500                | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 86/185_920                                                                       | P90                                                                                   | BN90LA4                                                                                   | 162                                                                                   |
| 1.6                     | 3932                 | 1.7 | 600  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_600                                                                     | P100                                                                                  | BN100LA6                                                                                  | 170                                                                                   |
| 1.6                     | 3932                 | 2.3 | 600  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_600                                                                     | P100                                                                                  | BN100LA6                                                                                  | 176                                                                                   |



## 1.5 kW

| n2<br>min-1 | M2<br>Nm | S   | i   | Rn2<br>N |  |  |  |  |  | IEC  |  |     |
|-------------|----------|-----|-----|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|
| 1.8         | 3495     | 1.2 | 800 | 19500    | —                                                                                 | —                                                                                 |                                                                                   | W/VF 86/185_800                                                                     | P90                                                                                 | BN90LA4                                                                                 | 162                                                                                 |     |
| 2.4         | 2743     | 1.5 | 600 | 19500    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/185_600                                                                     | P90                                                                                 | BN90LA4                                                                                 | 162                                                                                 |     |
| 2.4         | 2926     | 2.2 | 400 | 34500    |                                                                                   |                                                                                   |                                                                                   | VF/VF 130/210_400                                                                   | P100                                                                                | BN100LA6                                                                                | 170                                                                                 |     |
| 2.4         | 2865     | 3.2 | 400 | 52000    | —                                                                                 | —                                                                                 |                                                                                   | VF/VF 130/250_400                                                                   | P100                                                                                | BN100LA6                                                                                | 176                                                                                 |     |
| 2.7         | 2956     | 0.9 | 529 | 16000    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/150_529                                                                     | P90                                                                                 | BN90LA4                                                                                 | 154                                                                                 |     |
| 3.1         | 2570     | 1.0 | 460 | 16000    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/150_460                                                                     | P90                                                                                 | BN90LA4                                                                                 | 154                                                                                 |     |
| 3.1         | 2286     | 1.0 | 300 | 19500    | —                                                                                 | —                                                                                 |                                                                                   | VFR 185_300                                                                         | P100                                                                                | BN100LA6                                                                                | 160                                                                                 |     |
| 3.1         | 2240     | 1.6 | 300 | 34500    |                                                                                   |                                                                                   |                                                                                   | VFR 210_300                                                                         | P100                                                                                | BN100LA6                                                                                | 168                                                                                 |     |
| 3.1         | 2377     | 2.2 | 300 | 52000    |                                                                                   |                                                                                   |                                                                                   | VFR 250_300                                                                         | P100                                                                                | BN100LA6                                                                                | 174                                                                                 |     |
| 3.4         | 2134     | 3.0 | 280 | 34500    | —                                                                                 | —                                                                                 |                                                                                   | VF/VF 130/210_280                                                                   | P100                                                                                | BN100LA6                                                                                | 170                                                                                 |     |
| 3.5         | 1788     | 1.0 | 400 | 13800    |                                                                                   |                                                                                   |                                                                                   | W/VF 63/130_400                                                                     | P90                                                                                 | BN90LA4                                                                                 | 146                                                                                 |     |
| 3.5         | 1951     | 2.2 | 400 | 19500    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/185_400                                                                     | P90                                                                                 | BN90LA4                                                                                 | 162                                                                                 |     |
| 3.9         | 1975     | 0.9 | 240 | 16000    | —                                                                                 | —                                                                                 |                                                                                   | VFR 150_240                                                                         | P100                                                                                | BN100LA6                                                                                | 152                                                                                 |     |
| 3.9         | 1975     | 1.4 | 240 | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_240                                                                         | P100                                                                                | BN100LA6                                                                                | 160                                                                                 |     |
| 3.9         | 1975     | 2.2 | 240 | 34500    |                                                                                   |                                                                                   |                                                                                   | VFR 210_240                                                                         | P100                                                                                | BN100LA6                                                                                | 168                                                                                 |     |
| 3.9         | 2048     | 2.8 | 240 | 52000    | —                                                                                 | —                                                                                 |                                                                                   | VFR 250_240                                                                         | P100                                                                                | BN100LA6                                                                                | 174                                                                                 |     |
| 4.1         | 2033     | 1.3 | 345 | 16000    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/150_345                                                                     | P90                                                                                 | BN90LA4                                                                                 | 154                                                                                 |     |
| 4.7         | 1676     | 1.4 | 300 | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_300                                                                         | P90                                                                                 | BN90LA4                                                                                 | 160                                                                                 |     |
| 4.7         | 1768     | 1.5 | 300 | 16000    | —                                                                                 | —                                                                                 |                                                                                   | W/VF 86/150_300                                                                     | P90                                                                                 | BN90LA4                                                                                 | 154                                                                                 |     |
| 4.9         | 1726     | 1.1 | 192 | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_192                                                                         | P100                                                                                | BN100LA6                                                                                | 152                                                                                 |     |
| 5.0         | 1422     | 1.3 | 280 | 13800    |                                                                                   |                                                                                   |                                                                                   | W/VF 63/130_280                                                                     | P90                                                                                 | BN90LA4                                                                                 | 146                                                                                 |     |
| 5.0         | 1479     | 2.8 | 280 | 19500    | —                                                                                 | —                                                                                 |                                                                                   | W/VF 86/185_280                                                                     | P90                                                                                 | BN90LA4                                                                                 | 162                                                                                 |     |
| 5.2         | 1646     | 2.0 | 180 | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_180                                                                         | P100                                                                                | BN100LA6                                                                                | 160                                                                                 |     |
| 5.2         | 1481     | 3.3 | 180 | 34500    |                                                                                   |                                                                                   |                                                                                   | VFR 210_180                                                                         | P100                                                                                | BN100LA6                                                                                | 168                                                                                 |     |
| 5.6         | 1536     | 0.9 | 168 | 13800    | —                                                                                 | —                                                                                 |                                                                                   | VFR 130_168                                                                         | P100                                                                                | BN100LA6                                                                                | 144                                                                                 |     |
| 5.9         | 1414     | 1.1 | 240 | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_240                                                                         | P90                                                                                 | BN90LA4                                                                                 | 152                                                                                 |     |
| 5.9         | 1439     | 1.9 | 240 | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_240                                                                         | P90                                                                                 | BN90LA4                                                                                 | 160                                                                                 |     |
| 6.3         | 1440     | 1.8 | 225 | 16000    | —                                                                                 | —                                                                                 |                                                                                   | W/VF 86/150_225                                                                     | P90                                                                                 | BN90LA4                                                                                 | 154                                                                                 |     |
| 7.1         | 1300     | 2.0 | 200 | 16000    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/150_200                                                                     | P90                                                                                 | BN90LA4                                                                                 | 154                                                                                 |     |
| 7.3         | 1190     | 1.0 | 192 | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_192                                                                         | P90                                                                                 | BN90LA4                                                                                 | 144                                                                                 |     |
| 7.3         | 1209     | 1.4 | 192 | 16000    | —                                                                                 | —                                                                                 |                                                                                   | VFR 150_192                                                                         | P90                                                                                 | BN90LA4                                                                                 | 152                                                                                 |     |
| 7.8         | 1189     | 2.5 | 180 | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_180                                                                         | P90                                                                                 | BN90LA4                                                                                 | 160                                                                                 |     |
| 8.4         | 1092     | 1.1 | 168 | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_168                                                                         | P90                                                                                 | BN90LA4                                                                                 | 144                                                                                 |     |
| 8.4         | 1109     | 1.6 | 168 | 16000    | —                                                                                 | —                                                                                 |                                                                                   | VFR 150_168                                                                         | P90                                                                                 | BN90LA4                                                                                 | 152                                                                                 |     |
| 9.4         | 930      | 1.2 | 100 | 15500    |                                                                                   |                                                                                   |                                                                                   | VF 150_100                                                                          | P100                                                                                | BN100LA6                                                                                | 150                                                                                 |     |
| 9.4         | 945      | 2.1 | 100 | 19500    |                                                                                   |                                                                                   |                                                                                   | VF 185_100                                                                          | P100                                                                                | BN100LA6                                                                                | 158                                                                                 |     |
| 9.4         | 1021     | 3.2 | 150 | 16000    | —                                                                                 | —                                                                                 |                                                                                   | VFR 185_150                                                                         | P90                                                                                 | BN90LA4                                                                                 | 160                                                                                 |     |
| 10.2        | 939      | 1.4 | 138 | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_138                                                                         | P90                                                                                 | BN90LA4                                                                                 | 144                                                                                 |     |
| 10.2        | 953      | 2.1 | 138 | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_138                                                                         | P90                                                                                 | BN90LA4                                                                                 | 152                                                                                 |     |
| 10.4        | 905      | 1.0 | 90  | 8000     | —                                                                                 | —                                                                                 |                                                                                   | WR 110_90                                                                           | P100                                                                                | BN100LA6                                                                                | 140                                                                                 |     |
| 10.4        | 1001     | 3.2 | 90  | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_90                                                                          | P100                                                                                | BN100LA6                                                                                | 160                                                                                 |     |
| 11.8        | 829      | 1.0 | 120 | 8000     |                                                                                   |                                                                                   |                                                                                   | WR 110_120                                                                          | P90                                                                                 | BN90LA4                                                                                 | 140                                                                                 |     |
| 11.8        | 780      | 1.2 | 80  | 13200    | —                                                                                 | —                                                                                 |                                                                                   | VF 130_80                                                                           | P100                                                                                | BN100LA6                                                                                | 142                                                                                 |     |
| 11.8        | 792      | 1.7 | 80  | 15500    |                                                                                   |                                                                                   |                                                                                   | VF 150_80                                                                           | P100                                                                                | BN100LA6                                                                                | 150                                                                                 |     |
| 11.8        | 817      | 1.7 | 120 | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_120                                                                         | P90                                                                                 | BN90LA4                                                                                 | 144                                                                                 |     |
| 11.8        | 829      | 2.4 | 120 | 16000    | —                                                                                 | —                                                                                 |                                                                                   | VFR 150_120                                                                         | P90                                                                                 | BN90LA4                                                                                 | 152                                                                                 |     |
| 11.8        | 805      | 3.0 | 80  | 19000    |                                                                                   |                                                                                   |                                                                                   | VF 185_80                                                                           | P100                                                                                | BN100LA6                                                                                | 158                                                                                 |     |
| 13.6        | 789      | 1.0 | 69  | 8000     |                                                                                   |                                                                                   |                                                                                   | WR 110_69                                                                           | P100                                                                                | BN100LA6                                                                                | 140                                                                                 |     |
| 13.6        | 778      | 1.9 | 69  | 13800    | —                                                                                 | —                                                                                 |                                                                                   | VFR 130_69                                                                          | P100                                                                                | BN100LA6                                                                                | 144                                                                                 |     |
| 13.6        | 778      | 2.6 | 69  | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_69                                                                          | P100                                                                                | BN100LA6                                                                                | 152                                                                                 |     |
| 14.7        | 673      | 2.2 | 64  | 15500    |                                                                                   |                                                                                   |                                                                                   | VF 150_64                                                                           | P100                                                                                | BN100LA6                                                                                | 150                                                                                 |     |
| 15.7        | 640      | 1.3 | 90  | 8000     | —                                                                                 | —                                                                                 |                                                                                   | WR 110_90                                                                           | P90                                                                                 | BN90LA4                                                                                 | 140                                                                                 |     |
| 15.7        | 649      | 2.3 | 90  | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_90                                                                          | P90                                                                                 | BN90LA4                                                                                 | 144                                                                                 |     |
| 15.7        | 658      | 3.0 | 90  | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_90                                                                          | P90                                                                                 | BN90LA4                                                                                 | 152                                                                                 |     |
| 16.8        | 580      | 1.1 | 56  | 8000     | W 110_56                                                                          | S3                                                                                | M3LA6                                                                             | 138                                                                                 | W 110_56                                                                            | P100                                                                                    | BN100LA6                                                                            | 139 |
| 16.8        | 597      | 1.8 | 56  | 13200    |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 130_56                                                                           | P100                                                                                    | BN100LA6                                                                            | 142 |
| 16.8        | 606      | 2.5 | 56  | 15500    |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 150_56                                                                           | P100                                                                                    | BN100LA6                                                                            | 150 |
| 17.6        | 553      | 1.6 | 80  | 12600    | —                                                                                 | —                                                                                 |                                                                                   |                                                                                     | VF 130_80                                                                           | P90                                                                                     | BN90LA4                                                                             | 142 |
| 20.4        | 540      | 1.2 | 69  | 8000     |                                                                                   |                                                                                   |                                                                                   |                                                                                     | WR 110_69                                                                           | P90                                                                                     | BN90LA4                                                                             | 140 |
| 20.4        | 498      | 1.3 | 46  | 8000     |                                                                                   |                                                                                   |                                                                                   |                                                                                     | W 110_46                                                                            | P100                                                                                    | BN100LA6                                                                            | 139 |
| 20.4        | 533      | 2.4 | 69  | 13800    | —                                                                                 | —                                                                                 |                                                                                   |                                                                                     | VFR 130_69                                                                          | P90                                                                                     | BN90LA4                                                                             | 144 |
| 20.4        | 519      | 3.4 | 46  | 15500    |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 150_46                                                                           | P100                                                                                    | BN100LA6                                                                            | 150 |
| 20.4        | 540      | 3.4 | 69  | 16000    |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VFR 150_69                                                                          | P90                                                                                     | BN90LA4                                                                             | 152 |
| 22.0        | 455      | 1.2 | 64  | 8000     | W 110_64                                                                          | S3                                                                                | M3SA4                                                                             | 138                                                                                 | W 110_64                                                                            | P90                                                                                     | BN90LA4                                                                             | 139 |
| 22.0        | 462      | 2.0 | 64  | 12600    |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 130_64                                                                           | P90                                                                                     | BN90LA4                                                                             | 142 |

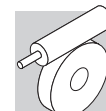


## 1.5 kW

| n2<br>min-1 | M2<br>Nm | S   | i    | Rn2<br>N |  |  |  |  |  |  | IEC  |  |
|-------------|----------|-----|------|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 23.5        | 482      | 1.4 | 60   | 8000     | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | WR 110_60                                                                           | P90                                                                                 | BN90LA4                                                                                 | 140                                                                                 |
| 23.5        | 445      | 2.7 | 40   | 13200    | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | VF 130_40                                                                           | P100                                                                                | BN100LA6                                                                                | 142                                                                                 |
| 23.5        | 475      | 2.8 | 60   | 13800    | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | VFR 130_60                                                                          | P90                                                                                 | BN90LA4                                                                                 | 144                                                                                 |
| 25.2        | 410      | 1.5 | 56   | 8000     | W 110_56                                                                          | S3                                                                                | M3SA4                                                                             | 138                                                                                | W 110_56                                                                            | P90                                                                                 | BN90LA4                                                                                 | 139                                                                                 |
| 25.2        | 415      | 2.3 | 56   | 12600    | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | VF 130_56                                                                           | P90                                                                                 | BN90LA4                                                                                 | 142                                                                                 |
| 31          | 341      | 1.0 | 46   | 7000     | W 86_46                                                                           | S3                                                                                | M3SA4                                                                             | 134                                                                                | W 86_46                                                                             | P90                                                                                 | BN90LA4                                                                                 | 135                                                                                 |
| 31          | 346      | 1.7 | 46   | 8000     | W 110_46                                                                          | S3                                                                                | M3SA4                                                                             | 138                                                                                | W 110_46                                                                            | P90                                                                                 | BN90LA4                                                                                 | 139                                                                                 |
| 31          | 355      | 3.0 | 46   | 12600    | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | VF 130_46                                                                           | P90                                                                                 | BN90LA4                                                                                 | 142                                                                                 |
| 31          | 357      | 1.1 | 45   | 7000     | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | WR 86_45                                                                            | P90                                                                                 | BN90LA4                                                                                 | 136                                                                                 |
| 31          | 366      | 1.9 | 45   | 8000     | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | WR 110_45                                                                           | P90                                                                                 | BN90LA4                                                                                 | 140                                                                                 |
| 35          | 305      | 1.1 | 40   | 7000     | W 86_40                                                                           | S3                                                                                | M3SA4                                                                             | 134                                                                                | W 86_40                                                                             | P90                                                                                 | BN90LA4                                                                                 | 135                                                                                 |
| 35          | 309      | 2.2 | 40   | 8000     | W 110_40                                                                          | S3                                                                                | M3SA4                                                                             | 138                                                                                | W 110_40                                                                            | P90                                                                                 | BN90LA4                                                                                 | 139                                                                                 |
| 38          | 293      | 0.9 | 37.5 | 4330     | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | WR 75_37.5                                                                          | P90                                                                                 | BN90LA4                                                                                 | 132                                                                                 |
| 38          | 293      | 0.9 | 25   | 4330     | W 75_25                                                                           | S3                                                                                | M3LA6                                                                             | 130                                                                                | W 75_25                                                                             | P100                                                                                | BN100LA6                                                                                | 131                                                                                 |
| 41          | 280      | 1.2 | 34.5 | 7000     | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | WR 86_34.5                                                                          | P90                                                                                 | BN90LA4                                                                                 | 136                                                                                 |
| 41          | 280      | 1.2 | 23   | 7000     | W 86_23                                                                           | S3                                                                                | M3LA6                                                                             | 134                                                                                | W 86_23                                                                             | P100                                                                                | BN100LA6                                                                                | 135                                                                                 |
| 47          | 256      | 1.1 | 30   | 4130     | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | WR 75_30                                                                            | P90                                                                                 | BN90LA4                                                                                 | 132                                                                                 |
| 47          | 235      | 1.2 | 30   | 4270     | W 75_30                                                                           | S3                                                                                | M3SA4                                                                             | 130                                                                                | W 75_30                                                                             | P90                                                                                 | BN90LA4                                                                                 | 131                                                                                 |
| 47          | 250      | 1.4 | 30   | 7000     | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | WR 86_30                                                                            | P90                                                                                 | BN90LA4                                                                                 | 136                                                                                 |
| 47          | 232      | 1.6 | 30   | 7000     | W 86_30                                                                           | S3                                                                                | M3SA4                                                                             | 134                                                                                | W 86_30                                                                             | P90                                                                                 | BN90LA4                                                                                 | 135                                                                                 |
| 47          | 235      | 3.0 | 30   | 8000     | W 110_30                                                                          | S3                                                                                | M3SA4                                                                             | 138                                                                                | W 110_30                                                                            | P90                                                                                 | BN90LA4                                                                                 | 139                                                                                 |
| 56          | 203      | 1.2 | 25   | 4100     | W 75_25                                                                           | S3                                                                                | M3SA4                                                                             | 130                                                                                | W 75_25                                                                             | P90                                                                                 | BN90LA4                                                                                 | 131                                                                                 |
| 61          | 192      | 1.7 | 23   | 7000     | W 86_23                                                                           | S3                                                                                | M3SA4                                                                             | 134                                                                                | W 86_23                                                                             | P90                                                                                 | BN90LA4                                                                                 | 135                                                                                 |
| 61          | 194      | 2.8 | 23   | 8000     | W 110_23                                                                          | S3                                                                                | M3SA4                                                                             | 138                                                                                | W 110_23                                                                            | P90                                                                                 | BN90LA4                                                                                 | 139                                                                                 |
| 71          | 169      | 1.5 | 20   | 3880     | W 75_20                                                                           | S3                                                                                | M3SA4                                                                             | 130                                                                                | W 75_20                                                                             | P90                                                                                 | BN90LA4                                                                                 | 131                                                                                 |
| 71          | 171      | 1.9 | 20   | 7000     | W 86_20                                                                           | S3                                                                                | M3SA4                                                                             | 134                                                                                | W 86_20                                                                             | P90                                                                                 | BN90LA4                                                                                 | 135                                                                                 |
| 71          | 171      | 3.3 | 20   | 8000     | W 110_20                                                                          | S3                                                                                | M3SA4                                                                             | 138                                                                                | W 110_20                                                                            | P90                                                                                 | BN90LA4                                                                                 | 139                                                                                 |
| 74          | 156      | 1.0 | 19   | 2550     | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | W 63_19                                                                             | P90                                                                                 | BN90LA4                                                                                 | 126                                                                                 |
| 94          | 126      | 1.2 | 15   | 2450     | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | W 63_15                                                                             | P90                                                                                 | BN90LA4                                                                                 | 126                                                                                 |
| 94          | 130      | 1.9 | 15   | 3630     | W 75_15                                                                           | S3                                                                                | M3SA4                                                                             | 130                                                                                | W 75_15                                                                             | P90                                                                                 | BN90LA4                                                                                 | 131                                                                                 |
| 94          | 131      | 2.4 | 15   | 6520     | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | WR 86_15                                                                            | P90                                                                                 | BN90LA4                                                                                 | 136                                                                                 |
| 94          | 130      | 2.5 | 15   | 6610     | W 86_15                                                                           | S3                                                                                | M3SA4                                                                             | 134                                                                                | W 86_15                                                                             | P90                                                                                 | BN90LA4                                                                                 | 135                                                                                 |
| 118         | 104      | 1.4 | 12   | 2340     | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | W 63_12                                                                             | P90                                                                                 | BN90LA4                                                                                 | 126                                                                                 |
| 134         | 94       | 2.2 | 7    | 3150     | W 75_7                                                                            | S3                                                                                | M3LA6                                                                             | 130                                                                                | W 75_7                                                                              | P100                                                                                | BN100LA6                                                                                | 131                                                                                 |
| 141         | 87       | 1.6 | 10   | 2250     | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | W 63_10                                                                             | P90                                                                                 | BN90LA4                                                                                 | 126                                                                                 |
| 141         | 89       | 2.6 | 10   | 3250     | W 75_10                                                                           | S3                                                                                | M3SA4                                                                             | 130                                                                                | W 75_10                                                                             | P90                                                                                 | BN90LA4                                                                                 | 131                                                                                 |
| 141         | 89       | 3.2 | 10   | 5850     | W 86_10                                                                           | S3                                                                                | M3SA4                                                                             | 134                                                                                | W 86_10                                                                             | P90                                                                                 | BN90LA4                                                                                 | 135                                                                                 |
| 187         | 66       | 1.9 | 15   | 2200     | W 63_15                                                                           | S2                                                                                | M2SB2                                                                             | 126                                                                                | W 63_15                                                                             | P90                                                                                 | BN90SA2                                                                                 | 127                                                                                 |
| 187         | 68       | 3.3 | 15   | 3120     | W 75_15                                                                           | S2                                                                                | M2SB2                                                                             | 130                                                                                | W 75_15                                                                             | P90                                                                                 | BN90SA2                                                                                 | 131                                                                                 |
| 201         | 63       | 1.9 | 7    | 2060     | —                                                                                 |                                                                                   |                                                                                   |                                                                                    | W 63_7                                                                              | P90                                                                                 | BN90LA4                                                                                 | 126                                                                                 |
| 201         | 64       | 3.0 | 7    | 2920     | W 75_7                                                                            | S3                                                                                | M3SA4                                                                             | 130                                                                                | W 75_7                                                                              | P90                                                                                 | BN90LA4                                                                                 | 131                                                                                 |
| 201         | 63       | 3.9 | 7    | 5240     | W 86_7                                                                            | S3                                                                                | M3SA4                                                                             | 134                                                                                | W 86_7                                                                              | P90                                                                                 | BN90LA4                                                                                 | 135                                                                                 |
| 233         | 53       | 2.3 | 12   | 2080     | W 63_12                                                                           | S2                                                                                | M2SB2                                                                             | 126                                                                                | W 63_12                                                                             | P90                                                                                 | BN90SA2                                                                                 | 127                                                                                 |
| 280         | 45       | 2.8 | 10   | 1980     | W 63_10                                                                           | S2                                                                                | M2SB2                                                                             | 126                                                                                | W 63_10                                                                             | P90                                                                                 | BN90SA2                                                                                 | 127                                                                                 |

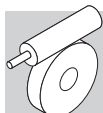
## 1.85 kW

| n2<br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i    | Rn2<br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|------|----------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 0.44                    | 8480                 | 1.1 | 3200 | 52000    | —                                                                                   |                                                                                     |                                                                                     | VF/VF 130/250_3200                                                                    | P90                                                                                   | BN90LB4                                                                                   | 176                                                                                   |
| 0.55                    | 8077                 | 1.1 | 2560 | 52000    | —                                                                                   |                                                                                     |                                                                                     | VF/VF 130/250_2560                                                                    | P90                                                                                   | BN90LB4                                                                                   | 176                                                                                   |
| 0.76                    | 7198                 | 1.3 | 1840 | 52000    | —                                                                                   |                                                                                     |                                                                                     | VF/VF 130/250_1840                                                                    | P90                                                                                   | BN90LB4                                                                                   | 176                                                                                   |
| 1.0                     | 6117                 | 1.1 | 920  | 34500    | —                                                                                   |                                                                                     |                                                                                     | VF/VF 130/210_920                                                                     | P100                                                                                  | BN100LB6                                                                                  | 170                                                                                   |
| 1.0                     | 6117                 | 1.5 | 920  | 52000    | —                                                                                   |                                                                                     |                                                                                     | VF/VF 130/250_920                                                                     | P100                                                                                  | BN100LB6                                                                                  | 176                                                                                   |
| 1.2                     | 5775                 | 1.1 | 800  | 34500    | —                                                                                   |                                                                                     |                                                                                     | VF/VF 130/210_800                                                                     | P100                                                                                  | BN100LB6                                                                                  | 170                                                                                   |
| 1.2                     | 6079                 | 1.5 | 800  | 52000    | —                                                                                   |                                                                                     |                                                                                     | VF/VF 130/250_800                                                                     | P100                                                                                  | BN100LB6                                                                                  | 176                                                                                   |
| 1.6                     | 4901                 | 1.3 | 600  | 34500    | —                                                                                   |                                                                                     |                                                                                     | VF/VF 130/210_600                                                                     | P100                                                                                  | BN100LB6                                                                                  | 170                                                                                   |
| 1.6                     | 4901                 | 1.9 | 600  | 52000    | —                                                                                   |                                                                                     |                                                                                     | VF/VF 130/250_600                                                                     | P100                                                                                  | BN100LB6                                                                                  | 176                                                                                   |
| 1.8                     | 4341                 | 1.0 | 800  | 19500    | —                                                                                   |                                                                                     |                                                                                     | W /VF 86/185_800                                                                      | P90                                                                                   | BN90LB4                                                                                   | 162                                                                                   |
| 2.3                     | 3647                 | 1.8 | 400  | 34500    | —                                                                                   |                                                                                     |                                                                                     | VF/VF 130/210_400                                                                     | P100                                                                                  | BN100LB6                                                                                  | 170                                                                                   |
| 2.3                     | 3571                 | 2.6 | 400  | 52000    | —                                                                                   |                                                                                     |                                                                                     | VF/VF 130/250_400                                                                     | P100                                                                                  | BN100LB6                                                                                  | 176                                                                                   |
| 2.3                     | 3407                 | 1.2 | 600  | 19500    | —                                                                                   |                                                                                     |                                                                                     | W/VF 86/185_600                                                                       | P90                                                                                   | BN90LB4                                                                                   | 162                                                                                   |



## 1.85 kW

| n2<br>min-1 | M2<br>Nm | S   | i   | Rn2<br>N |  |  |  |  |  | IEC  |  |     |
|-------------|----------|-----|-----|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|
| 3.1         | 2793     | 1.3 | 300 | 34500    | —                                                                                 |                                                                                   |                                                                                   | VFR 210_300                                                                         | P100                                                                                | BN100LB6                                                                                | 168                                                                                 |     |
| 3.1         | 2964     | 1.8 | 300 | 52000    |                                                                                   |                                                                                   |                                                                                   | VFR 250_300                                                                         | P100                                                                                | BN100LB6                                                                                | 174                                                                                 |     |
| 3.3         | 2660     | 2.4 | 280 | 34500    | —                                                                                 |                                                                                   |                                                                                   | VF/VF 130/210_280                                                                   | P100                                                                                | BN100LB6                                                                                | 170                                                                                 |     |
| 3.3         | 2713     | 3.4 | 280 | 52000    |                                                                                   |                                                                                   |                                                                                   | VF/VF 130/250_280                                                                   | P100                                                                                | BN100LB6                                                                                | 176                                                                                 |     |
| 3.5         | 2423     | 1.7 | 400 | 19500    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/185_400                                                                     | P90                                                                                 | BN90LB4                                                                                 | 162                                                                                 |     |
| 3.9         | 2462     | 1.1 | 240 | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_240                                                                         | P100                                                                                | BN100LB6                                                                                | 160                                                                                 |     |
| 3.9         | 2462     | 1.8 | 240 | 34500    | —                                                                                 |                                                                                   |                                                                                   | VFR 210_240                                                                         | P100                                                                                | BN100LB6                                                                                | 168                                                                                 |     |
| 3.9         | 2553     | 2.3 | 240 | 52000    |                                                                                   |                                                                                   |                                                                                   | VFR 250_240                                                                         | P100                                                                                | BN100LB6                                                                                | 174                                                                                 |     |
| 4.1         | 2525     | 1.0 | 345 | 16000    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/150_345                                                                     | P90                                                                                 | BN90LB4                                                                                 | 154                                                                                 |     |
| 4.7         | 2082     | 1.1 | 300 | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_300                                                                         | P90                                                                                 | BN90LB4                                                                                 | 160                                                                                 |     |
| 4.7         | 2196     | 1.2 | 300 | 16000    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/150_300                                                                     | P90                                                                                 | BN90LB4                                                                                 | 154                                                                                 |     |
| 4.8         | 2152     | 0.9 | 192 | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_192                                                                         | P100                                                                                | BN100LB6                                                                                | 152                                                                                 |     |
| 5.0         | 1767     | 1.0 | 280 | 13800    | —                                                                                 |                                                                                   |                                                                                   | W/VF 63/130_280                                                                     | P90                                                                                 | BN90LB4                                                                                 | 146                                                                                 |     |
| 5.0         | 1837     | 2.3 | 280 | 19500    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/185_280                                                                     | P90                                                                                 | BN90LB4                                                                                 | 162                                                                                 |     |
| 5.2         | 2052     | 1.6 | 180 | 19500    | —                                                                                 |                                                                                   |                                                                                   | VFR 185_180                                                                         | P100                                                                                | BN100LB6                                                                                | 160                                                                                 |     |
| 5.2         | 1847     | 2.7 | 180 | 34500    |                                                                                   |                                                                                   |                                                                                   | VFR 210_180                                                                         | P100                                                                                | BN100LB6                                                                                | 168                                                                                 |     |
| 5.2         | 2120     | 3.2 | 180 | 52000    | —                                                                                 |                                                                                   |                                                                                   | VFR 250_180                                                                         | P100                                                                                | BN100LB6                                                                                | 174                                                                                 |     |
| 5.8         | 1757     | 0.9 | 240 | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_240                                                                         | P90                                                                                 | BN90LB4                                                                                 | 152                                                                                 |     |
| 5.8         | 1787     | 1.6 | 240 | 19500    | —                                                                                 |                                                                                   |                                                                                   | VFR 185_240                                                                         | P90                                                                                 | BN90LB4                                                                                 | 160                                                                                 |     |
| 6.2         | 1767     | 3.0 | 150 | 34500    |                                                                                   |                                                                                   |                                                                                   | VFR 210_150                                                                         | P100                                                                                | BN100LB6                                                                                | 168                                                                                 |     |
| 6.2         | 1789     | 1.5 | 225 | 16000    | —                                                                                 |                                                                                   |                                                                                   | W/VF 86/150_225                                                                     | P90                                                                                 | BN90LB4                                                                                 | 154                                                                                 |     |
| 6.7         | 1678     | 0.9 | 138 | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_138                                                                         | P100                                                                                | BN100LB6                                                                                | 144                                                                                 |     |
| 6.7         | 1678     | 1.3 | 138 | 16000    | —                                                                                 |                                                                                   |                                                                                   | VFR 150_138                                                                         | P100                                                                                | BN100LB6                                                                                | 152                                                                                 |     |
| 7.0         | 1615     | 1.6 | 200 | 16000    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/150_200                                                                     | P90                                                                                 | BN90LB4                                                                                 | 154                                                                                 |     |
| 7.3         | 1502     | 1.1 | 192 | 16000    | —                                                                                 |                                                                                   |                                                                                   | VFR 150_192                                                                         | P90                                                                                 | BN90LB4                                                                                 | 152                                                                                 |     |
| 7.8         | 1476     | 2.0 | 180 | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_180                                                                         | P90                                                                                 | BN90LB4                                                                                 | 160                                                                                 |     |
| 8.3         | 1357     | 0.9 | 168 | 13800    | —                                                                                 |                                                                                   |                                                                                   | VFR 130_168                                                                         | P90                                                                                 | BN90LB4                                                                                 | 144                                                                                 |     |
| 8.3         | 1378     | 1.3 | 168 | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_168                                                                         | P90                                                                                 | BN90LB4                                                                                 | 152                                                                                 |     |
| 9.3         | 1159     | 1.0 | 100 | 15500    | —                                                                                 |                                                                                   |                                                                                   | VF 150_100                                                                          | P100                                                                                | BN100LB6                                                                                | 150                                                                                 |     |
| 9.3         | 1178     | 1.7 | 100 | 19000    |                                                                                   |                                                                                   |                                                                                   | VF 185_100                                                                          | P100                                                                                | BN100LB6                                                                                | 158                                                                                 |     |
| 9.3         | 1268     | 2.6 | 150 | 19500    | —                                                                                 |                                                                                   |                                                                                   | VFR 185_150                                                                         | P90                                                                                 | BN90LB4                                                                                 | 160                                                                                 |     |
| 10.1        | 1167     | 1.2 | 138 | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_138                                                                         | P90                                                                                 | BN90LB4                                                                                 | 144                                                                                 |     |
| 10.1        | 1184     | 1.7 | 138 | 16000    | —                                                                                 |                                                                                   |                                                                                   | VFR 150_138                                                                         | P90                                                                                 | BN90LB4                                                                                 | 152                                                                                 |     |
| 11.6        | 973      | 1.0 | 80  | 13200    |                                                                                   |                                                                                   |                                                                                   | VF 130_80                                                                           | P100                                                                                | BN100LB6                                                                                | 142                                                                                 |     |
| 11.6        | 988      | 1.4 | 80  | 15500    | —                                                                                 |                                                                                   |                                                                                   | VF 150_80                                                                           | P100                                                                                | BN100LB6                                                                                | 150                                                                                 |     |
| 11.6        | 1003     | 2.4 | 80  | 19000    |                                                                                   |                                                                                   |                                                                                   | VF 185_80                                                                           | P100                                                                                | BN100LB6                                                                                | 158                                                                                 |     |
| 11.7        | 1015     | 1.4 | 120 | 13800    | —                                                                                 |                                                                                   |                                                                                   | VFR 130_120                                                                         | P90                                                                                 | BN90LB4                                                                                 | 144                                                                                 |     |
| 11.7        | 1030     | 1.9 | 120 | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_120                                                                         | P90                                                                                 | BN90LB4                                                                                 | 152                                                                                 |     |
| 11.7        | 1060     | 3.4 | 120 | 19500    | —                                                                                 |                                                                                   |                                                                                   | VFR 185_120                                                                         | P90                                                                                 | BN90LB4                                                                                 | 160                                                                                 |     |
| 13.5        | 970      | 1.5 | 69  | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_69                                                                          | P100                                                                                | BN100LB6                                                                                | 144                                                                                 |     |
| 13.5        | 970      | 2.1 | 69  | 16000    | —                                                                                 |                                                                                   |                                                                                   | VFR 150_69                                                                          | P100                                                                                | BN100LB6                                                                                | 152                                                                                 |     |
| 14.5        | 839      | 1.7 | 64  | 15500    |                                                                                   |                                                                                   |                                                                                   | VF 150_64                                                                           | P100                                                                                | BN100LB6                                                                                | 150                                                                                 |     |
| 15.6        | 795      | 1.0 | 90  | 8000     | —                                                                                 |                                                                                   |                                                                                   | WR 110_90                                                                           | P90                                                                                 | BN90LB4                                                                                 | 140                                                                                 |     |
| 15.6        | 806      | 1.9 | 90  | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_90                                                                          | P90                                                                                 | BN90LB4                                                                                 | 144                                                                                 |     |
| 15.6        | 818      | 2.4 | 90  | 16000    | —                                                                                 |                                                                                   |                                                                                   | VFR 150_90                                                                          | P90                                                                                 | BN90LB4                                                                                 | 152                                                                                 |     |
| 15.6        | 863      | 3.2 | 90  | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_90                                                                          | P90                                                                                 | BN90LB4                                                                                 | 160                                                                                 |     |
| 16.6        | 755      | 2.0 | 56  | 15500    | —                                                                                 |                                                                                   |                                                                                   | VF 150_56                                                                           | P100                                                                                | BN100LB6                                                                                | 150                                                                                 |     |
| 17.5        | 687      | 1.3 | 80  | 12600    |                                                                                   |                                                                                   |                                                                                   | VF 130_80                                                                           | P90                                                                                 | BN90LB4                                                                                 | 142                                                                                 |     |
| 20.2        | 647      | 2.7 | 46  | 15500    | —                                                                                 |                                                                                   |                                                                                   | VF 150_46                                                                           | P100                                                                                | BN100LB6                                                                                | 150                                                                                 |     |
| 20.3        | 670      | 1.0 | 69  | 8000     |                                                                                   |                                                                                   |                                                                                   | WR 110_69                                                                           | P90                                                                                 | BN90LB4                                                                                 | 140                                                                                 |     |
| 20.3        | 662      | 2.0 | 69  | 13800    | —                                                                                 |                                                                                   |                                                                                   | VFR 130_69                                                                          | P90                                                                                 | BN90LB4                                                                                 | 144                                                                                 |     |
| 20.3        | 670      | 2.8 | 69  | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_69                                                                          | P90                                                                                 | BN90LB4                                                                                 | 152                                                                                 |     |
| 21.9        | 565      | 0.9 | 64  | 8000     | —                                                                                 |                                                                                   |                                                                                   | W 110_64                                                                            | P90                                                                                 | BN90LB4                                                                                 | 138                                                                                 |     |
| 21.9        | 573      | 1.6 | 64  | 12600    |                                                                                   |                                                                                   |                                                                                   | VF 130_64                                                                           | P90                                                                                 | BN90LB4                                                                                 | 142                                                                                 |     |
| 23.3        | 555      | 1.3 | 40  | 8000     | W 110_40                                                                          | S3                                                                                | M3LB6                                                                             | 138                                                                                 | W 110_40                                                                            | P100                                                                                    | BN100LB6                                                                            | 139 |
| 23.3        | 562      | 3.1 | 40  | 15500    |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 150_40                                                                           | P100                                                                                    | BN100LB6                                                                            | 150 |
| 23.3        | 598      | 1.1 | 60  | 8000     | —                                                                                 |                                                                                   |                                                                                   | WR 110_60                                                                           | P90                                                                                 | BN90LB4                                                                                 | 140                                                                                 |     |
| 23.3        | 591      | 2.3 | 60  | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_60                                                                          | P90                                                                                 | BN90LB4                                                                                 | 144                                                                                 |     |
| 23.3        | 598      | 3.2 | 60  | 16000    | —                                                                                 |                                                                                   |                                                                                   | VFR 150_60                                                                          | P90                                                                                 | BN90LB4                                                                                 | 152                                                                                 |     |
| 25.0        | 509      | 1.2 | 56  | 8000     |                                                                                   |                                                                                   |                                                                                   | W 110_56                                                                            | P90                                                                                 | BN90LB4                                                                                 | 138                                                                                 |     |
| 25.0        | 516      | 1.9 | 56  | 12600    | —                                                                                 |                                                                                   |                                                                                   | VF 130_56                                                                           | P90                                                                                 | BN90LB4                                                                                 | 142                                                                                 |     |
| 30          | 430      | 1.4 | 46  | 8000     |                                                                                   |                                                                                   |                                                                                   | W 110_46                                                                            | P90                                                                                 | BN90LB4                                                                                 | 138                                                                                 |     |
| 30          | 441      | 2.4 | 46  | 12600    | W 86_30                                                                           | S3                                                                                | M3LB6                                                                             | 134                                                                                 | VF 130_46                                                                           | P90                                                                                     | BN90LB4                                                                             | 142 |
| 31          | 416      | 1.0 | 30  | 7000     |                                                                                   |                                                                                   |                                                                                   |                                                                                     | W 86_30                                                                             | P100                                                                                    | BN100LB6                                                                            | 135 |
| 31          | 443      | 0.9 | 45  | 7000     | —                                                                                 |                                                                                   |                                                                                   | WR 86_45                                                                            | P90                                                                                 | BN90LB4                                                                                 | 136                                                                                 |     |

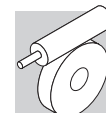


## 1.85 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i    | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |     |
|-------------------------------------|----------------------|-----|------|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|
| 31                                  | 454                  | 1.6 | 45   | 8000                 |                                                                                   | —                                                                                 |                                                                                   | WR 110_45                                                                           | P90                                                                                 | BN90LB4                                                                                 | 140                                                                                 |     |
| 35                                  | 384                  | 1.7 | 40   | 8000                 |                                                                                   | —                                                                                 |                                                                                   | W 110_40                                                                            | P90                                                                                 | BN90LB4                                                                                 | 138                                                                                 |     |
| 40                                  | 350                  | 1.0 | 23   | 7000                 | W 86_23                                                                           | S3                                                                                | M3LB6                                                                             | 134                                                                                 | W 86_23                                                                             | P100                                                                                    | BN100LB6                                                                            | 135 |
| 40                                  | 354                  | 3.0 | 23   | 13200                |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 130_23                                                                           | P100                                                                                    | BN100LB6                                                                            | 142 |
| 41                                  | 348                  | 1.0 | 34.5 | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_34.5                                                                          | P90                                                                                 | BN90LB4                                                                                 | 136                                                                                 |     |
| 42                                  | 339                  | 3.1 | 69   | 13800                |                                                                                   | —                                                                                 |                                                                                   | VFR 130_69                                                                          | P90                                                                                 | BN90SB2                                                                                 | 144                                                                                 |     |
| 47                                  | 308                  | 1.1 | 20   | 7000                 | W 86_20                                                                           | S3                                                                                | M3LB6                                                                             | 134                                                                                 | W 86_20                                                                             | P100                                                                                    | BN100LB6                                                                            | 135 |
| 47                                  | 312                  | 3.4 | 20   | 13200                |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 130_20                                                                           | P100                                                                                    | BN100LB6                                                                            | 142 |
| 47                                  | 292                  | 0.9 | 30   | 3960                 |                                                                                   | —                                                                                 |                                                                                   | W 75_30                                                                             | P90                                                                                 | BN90LB4                                                                                 | 130                                                                                 |     |
| 47                                  | 310                  | 1.1 | 30   | 7000                 |                                                                                   | —                                                                                 |                                                                                   | WR 86_30                                                                            | P90                                                                                 | BN90LB4                                                                                 | 136                                                                                 |     |
| 47                                  | 288                  | 1.3 | 30   | 7000                 |                                                                                   | —                                                                                 |                                                                                   | W 86_30                                                                             | P90                                                                                 | BN90LB4                                                                                 | 134                                                                                 |     |
| 47                                  | 318                  | 2.1 | 30   | 8000                 |                                                                                   | —                                                                                 |                                                                                   | WR 110_30                                                                           | P90                                                                                 | BN90LB4                                                                                 | 140                                                                                 |     |
| 47                                  | 292                  | 2.4 | 30   | 8000                 |                                                                                   | —                                                                                 |                                                                                   | W 110_30                                                                            | P90                                                                                 | BN90LB4                                                                                 | 138                                                                                 |     |
| 56                                  | 252                  | 1.0 | 25   | 3820                 |                                                                                   | —                                                                                 |                                                                                   | W 75_25                                                                             | P90                                                                                 | BN90LB4                                                                                 | 130                                                                                 |     |
| 61                                  | 238                  | 1.3 | 23   | 7000                 |                                                                                   | —                                                                                 |                                                                                   | W 86_23                                                                             | P90                                                                                 | BN90LB4                                                                                 | 134                                                                                 |     |
| 61                                  | 241                  | 2.2 | 23   | 8000                 |                                                                                   | —                                                                                 |                                                                                   | W 110_23                                                                            | P90                                                                                 | BN90LB4                                                                                 | 138                                                                                 |     |
| 62                                  | 237                  | 1.1 | 15   | 3600                 | W 75_15                                                                           | S3                                                                                | M3LB6                                                                             | 130                                                                                 | W 75_15                                                                             | P100                                                                                    | BN100LB6                                                                            | 131 |
| 62                                  | 234                  | 1.5 | 15   | 7000                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     | W 86_15                                                                             | S3                                                                                      | M3LB6                                                                               | 134 |
| 67                                  | 228                  | 2.6 | 21   | 8000                 |                                                                                   | —                                                                                 |                                                                                   | WR 110_21                                                                           | P90                                                                                 | BN90LB4                                                                                 | 140                                                                                 |     |
| 70                                  | 209                  | 1.2 | 20   | 3650                 |                                                                                   | —                                                                                 |                                                                                   | W 75_20                                                                             | P90                                                                                 | BN90LB4                                                                                 | 130                                                                                 |     |
| 70                                  | 212                  | 1.5 | 20   | 6960                 |                                                                                   | —                                                                                 |                                                                                   | W 86_20                                                                             | P90                                                                                 | BN90LB4                                                                                 | 134                                                                                 |     |
| 70                                  | 212                  | 2.7 | 20   | 8000                 |                                                                                   | —                                                                                 |                                                                                   | W 110_20                                                                            | P90                                                                                 | BN90LB4                                                                                 | 138                                                                                 |     |
| 93                                  | 163                  | 1.5 | 10   | 3280                 | W 75_10                                                                           | S3                                                                                | M3LB6                                                                             | 130                                                                                 | W 75_10                                                                             | P100                                                                                    | BN100LB6                                                                            | 131 |
| 93                                  | 157                  | 1.0 | 15   | 2230                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     | W 63_15                                                                             | P90                                                                                     | BN90LB4                                                                             | 126 |
| 93                                  | 161                  | 1.6 | 15   | 3440                 |                                                                                   | —                                                                                 |                                                                                   | W 75_15                                                                             | P90                                                                                 | BN90LB4                                                                                 | 130                                                                                 |     |
| 93                                  | 161                  | 2.1 | 15   | 6450                 |                                                                                   | —                                                                                 |                                                                                   | W 86_15                                                                             | P90                                                                                 | BN90LB4                                                                                 | 134                                                                                 |     |
| 117                                 | 129                  | 1.1 | 12   | 2150                 |                                                                                   | —                                                                                 |                                                                                   | W 63_12                                                                             | P90                                                                                 | BN90LB4                                                                                 | 126                                                                                 |     |
| 133                                 | 117                  | 1.8 | 7    | 2970                 | W 75_7                                                                            | S3                                                                                | M3LB6                                                                             | 130                                                                                 | W 75_7                                                                              | P100                                                                                    | BN100LB6                                                                            | 131 |
| 133                                 | 117                  | 2.3 | 7    | 5700                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     | W 86_7                                                                              | S3                                                                                      | M3LB6                                                                               | 134 |
| 140                                 | 109                  | 1.3 | 10   | 2090                 |                                                                                   | —                                                                                 |                                                                                   | W 63_10                                                                             | P90                                                                                 | BN90LB4                                                                                 | 126                                                                                 |     |
| 140                                 | 111                  | 2.1 | 10   | 3100                 |                                                                                   | —                                                                                 |                                                                                   | W 75_10                                                                             | P90                                                                                 | BN90LB4                                                                                 | 130                                                                                 |     |
| 140                                 | 111                  | 2.6 | 10   | 5730                 |                                                                                   | —                                                                                 |                                                                                   | W 86_10                                                                             | P90                                                                                 | BN90LB4                                                                                 | 134                                                                                 |     |
| 192                                 | 79                   | 1.6 | 15   | 2080                 |                                                                                   | —                                                                                 |                                                                                   | W 63_15                                                                             | P90                                                                                 | BN90SB2                                                                                 | 126                                                                                 |     |
| 192                                 | 81                   | 2.8 | 15   | 3000                 |                                                                                   | —                                                                                 |                                                                                   | W 75_15                                                                             | P90                                                                                 | BN90SB2                                                                                 | 130                                                                                 |     |
| 200                                 | 78                   | 1.5 | 7    | 1930                 |                                                                                   | —                                                                                 |                                                                                   | W 63_7                                                                              | P90                                                                                 | BN90LB4                                                                                 | 126                                                                                 |     |
| 200                                 | 80                   | 2.4 | 7    | 2790                 |                                                                                   | —                                                                                 |                                                                                   | W 75_7                                                                              | P90                                                                                 | BN90LB4                                                                                 | 130                                                                                 |     |
| 200                                 | 79                   | 3.2 | 7    | 5140                 |                                                                                   | —                                                                                 |                                                                                   | W 86_7                                                                              | P90                                                                                 | BN90LB4                                                                                 | 134                                                                                 |     |
| 240                                 | 64                   | 2.0 | 12   | 1980                 |                                                                                   | —                                                                                 |                                                                                   | W 63_12                                                                             | P90                                                                                 | BN90SB2                                                                                 | 126                                                                                 |     |
| 288                                 | 54                   | 2.3 | 10   | 1890                 |                                                                                   | —                                                                                 |                                                                                   | W 63_10                                                                             | P90                                                                                 | BN90SB2                                                                                 | 126                                                                                 |     |
| 288                                 | 55                   | 3.7 | 10   | 2670                 |                                                                                   | —                                                                                 |                                                                                   | W 75_10                                                                             | P90                                                                                 | BN90SB2                                                                                 | 130                                                                                 |     |
| 411                                 | 39                   | 2.7 | 7    | 1720                 |                                                                                   | —                                                                                 |                                                                                   | W 63_7                                                                              | P90                                                                                 | BN90SB2                                                                                 | 126                                                                                 |     |

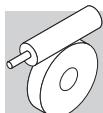
## 2.2 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i    | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|------|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 0.44                    | 10013                | 0.9 | 3200 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_3200                                                                    | P100                                                                                  | BN100LA4                                                                                  | 176                                                                                   |
| 0.55                    | 9536                 | 0.9 | 2560 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_2560                                                                    | P100                                                                                  | BN100LA4                                                                                  | 176                                                                                   |
| 0.77                    | 8499                 | 1.1 | 1840 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_1840                                                                    | P100                                                                                  | BN100LA4                                                                                  | 176                                                                                   |
| 0.88                    | 7629                 | 1.2 | 1600 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_1600                                                                    | P100                                                                                  | BN100LA4                                                                                  | 176                                                                                   |
| 1.0                     | 7197                 | 0.9 | 920  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_920                                                                     | P112                                                                                  | BN112M6                                                                                   | 170                                                                                   |
| 1.0                     | 7197                 | 1.3 | 920  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_920                                                                     | P112                                                                                  | BN112M6                                                                                   | 176                                                                                   |
| 1.2                     | 6258                 | 1.0 | 1200 | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_1200                                                                    | P100                                                                                  | BN100LA4                                                                                  | 170                                                                                   |
| 1.2                     | 6258                 | 1.4 | 1200 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_1200                                                                    | P100                                                                                  | BN100LA4                                                                                  | 176                                                                                   |
| 1.5                     | 5072                 | 1.2 | 920  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_920                                                                     | P100                                                                                  | BN100LA4                                                                                  | 170                                                                                   |
| 1.5                     | 5072                 | 1.8 | 920  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_920                                                                     | P100                                                                                  | BN100LA4                                                                                  | 176                                                                                   |
| 1.8                     | 4887                 | 1.3 | 800  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_800                                                                     | P100                                                                                  | BN100LA4                                                                                  | 170                                                                                   |
| 1.8                     | 5007                 | 1.8 | 800  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_800                                                                     | P100                                                                                  | BN100LA4                                                                                  | 176                                                                                   |
| 2.4                     | 4023                 | 1.0 | 600  | 19500                | —                                                                                   | —                                                                                   | —                                                                                   | W/VF 86/185_600                                                                       | P100                                                                                  | BN100LA4                                                                                  | 162                                                                                   |
| 2.4                     | 3844                 | 1.6 | 600  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_600                                                                     | P100                                                                                  | BN100LA4                                                                                  | 170                                                                                   |
| 2.4                     | 3934                 | 2.3 | 600  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_600                                                                     | P100                                                                                  | BN100LA4                                                                                  | 176                                                                                   |
| 3.1                     | 3286                 | 1.1 | 300  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VFR 210_300                                                                           | P112                                                                                  | BN112M6                                                                                   | 168                                                                                   |



## 2.2 kW

| n2<br>min-1 | M2<br>Nm | S   | i   | Rn2<br>N |  |  |  |  |  | IEC  |  |
|-------------|----------|-----|-----|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 3.1         | 3487     | 1.5 | 300 | 52000    | —                                                                                 | —                                                                                 |                                                                                   | VFR 250_300                                                                         | P112                                                                                | BN112M6                                                                                 | 174                                                                                 |
| 3.5         | 2861     | 1.5 | 400 | 19500    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/185_400                                                                     | P100                                                                                | BN100LA4                                                                                | 162                                                                                 |
| 3.5         | 2980     | 2.1 | 400 | 34500    |                                                                                   |                                                                                   |                                                                                   | VF/VF 130/210_400                                                                   | P100                                                                                | BN100LA4                                                                                | 170                                                                                 |
| 3.5         | 2921     | 3.1 | 400 | 52000    |                                                                                   |                                                                                   |                                                                                   | VF/VF 130/250_400                                                                   | P100                                                                                | BN100LA4                                                                                | 176                                                                                 |
| 3.9         | 2897     | 1.0 | 240 | 19500    | —                                                                                 | —                                                                                 |                                                                                   | VFR 185_240                                                                         | P112                                                                                | BN112M6                                                                                 | 160                                                                                 |
| 3.9         | 2897     | 1.5 | 240 | 34500    |                                                                                   |                                                                                   |                                                                                   | VFR 210_240                                                                         | P112                                                                                | BN112M6                                                                                 | 168                                                                                 |
| 3.9         | 3004     | 1.9 | 240 | 52000    |                                                                                   |                                                                                   |                                                                                   | VFR 250_240                                                                         | P112                                                                                | BN112M6                                                                                 | 174                                                                                 |
| 4.7         | 2459     | 0.9 | 300 | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_300                                                                         | P100                                                                                | BN100LA4                                                                                | 160                                                                                 |
| 4.7         | 2459     | 1.4 | 300 | 34500    | —                                                                                 | —                                                                                 |                                                                                   | VFR 210_300                                                                         | P100                                                                                | BN100LA4                                                                                | 168                                                                                 |
| 4.7         | 2548     | 2.0 | 300 | 52000    |                                                                                   |                                                                                   |                                                                                   | VFR 250_300                                                                         | P100                                                                                | BN100LA4                                                                                | 174                                                                                 |
| 5.0         | 2170     | 1.9 | 280 | 19500    |                                                                                   |                                                                                   |                                                                                   | W/VF 86/185_280                                                                     | P100                                                                                | BN100LA4                                                                                | 162                                                                                 |
| 5.0         | 2170     | 2.9 | 280 | 34500    |                                                                                   |                                                                                   |                                                                                   | VF/VF 130/210_280                                                                   | P100                                                                                | BN100LA4                                                                                | 170                                                                                 |
| 5.6         | 2291     | 0.9 | 168 | 16000    | —                                                                                 | —                                                                                 |                                                                                   | VFR 150_168                                                                         | P112                                                                                | BN112M6                                                                                 | 152                                                                                 |
| 5.9         | 2110     | 1.3 | 240 | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_240                                                                         | P100                                                                                | BN100LA4                                                                                | 160                                                                                 |
| 5.9         | 2110     | 1.8 | 240 | 34500    |                                                                                   |                                                                                   |                                                                                   | VFR 210_240                                                                         | P100                                                                                | BN100LA4                                                                                | 168                                                                                 |
| 5.9         | 2181     | 2.5 | 240 | 52000    |                                                                                   |                                                                                   |                                                                                   | VFR 250_240                                                                         | P100                                                                                | BN100LA4                                                                                | 174                                                                                 |
| 7.3         | 1774     | 1.0 | 192 | 16000    | —                                                                                 | —                                                                                 |                                                                                   | VFR 150_192                                                                         | P100                                                                                | BN100LA4                                                                                | 152                                                                                 |
| 7.8         | 1690     | 0.9 | 120 | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_120                                                                         | P112                                                                                | BN112M6                                                                                 | 144                                                                                 |
| 7.8         | 1743     | 1.7 | 180 | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_180                                                                         | P100                                                                                | BN100LA4                                                                                | 160                                                                                 |
| 7.8         | 1717     | 2.5 | 180 | 34500    |                                                                                   |                                                                                   |                                                                                   | VFR 210_180                                                                         | P100                                                                                | BN100LA4                                                                                | 168                                                                                 |
| 7.8         | 1797     | 3.5 | 180 | 52000    | —                                                                                 | —                                                                                 |                                                                                   | VFR 250_180                                                                         | P100                                                                                | BN100LA4                                                                                | 174                                                                                 |
| 8.4         | 1627     | 1.1 | 168 | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_168                                                                         | P100                                                                                | BN100LA4                                                                                | 152                                                                                 |
| 9.4         | 1386     | 1.4 | 100 | 19000    |                                                                                   |                                                                                   |                                                                                   | VF 185_100                                                                          | P112                                                                                | BN112M6                                                                                 | 158                                                                                 |
| 9.4         | 1498     | 2.2 | 150 | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_150                                                                         | P100                                                                                | BN100LA4                                                                                | 160                                                                                 |
| 9.4         | 1498     | 3.0 | 150 | 34500    | —                                                                                 | —                                                                                 |                                                                                   | VFR 210_150                                                                         | P100                                                                                | BN100LA4                                                                                | 168                                                                                 |
| 10.2        | 1378     | 1.0 | 138 | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_138                                                                         | P100                                                                                | BN100LA4                                                                                | 144                                                                                 |
| 10.2        | 1398     | 1.4 | 138 | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_138                                                                         | P100                                                                                | BN100LA4                                                                                | 152                                                                                 |
| 10.4        | 1468     | 2.2 | 90  | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_90                                                                          | P112                                                                                | BN112M6                                                                                 | 160                                                                                 |
| 10.4        | 1448     | 3.2 | 90  | 34500    | —                                                                                 | —                                                                                 |                                                                                   | VFR 210_90                                                                          | P112                                                                                | BN112M6                                                                                 | 168                                                                                 |
| 11.8        | 1162     | 1.2 | 80  | 15500    |                                                                                   |                                                                                   |                                                                                   | VF 150_80                                                                           | P112                                                                                | BN112M6                                                                                 | 150                                                                                 |
| 11.8        | 1198     | 1.2 | 120 | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_120                                                                         | P100                                                                                | BN100LA4                                                                                | 144                                                                                 |
| 11.8        | 1216     | 1.6 | 120 | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_120                                                                         | P100                                                                                | BN100LA4                                                                                | 152                                                                                 |
| 11.8        | 1180     | 2.0 | 80  | 19000    | —                                                                                 | —                                                                                 |                                                                                   | VF 185_80                                                                           | P112                                                                                | BN112M6                                                                                 | 158                                                                                 |
| 11.8        | 1252     | 2.9 | 120 | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_120                                                                         | P100                                                                                | BN100LA4                                                                                | 160                                                                                 |
| 11.8        | 1252     | 4.0 | 120 | 34500    |                                                                                   |                                                                                   |                                                                                   | VFR 210_120                                                                         | P100                                                                                | BN100LA4                                                                                | 168                                                                                 |
| 13.6        | 1141     | 1.3 | 69  | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_69                                                                          | P112                                                                                | BN112M6                                                                                 | 144                                                                                 |
| 13.6        | 1141     | 1.8 | 69  | 16000    | —                                                                                 | —                                                                                 |                                                                                   | VFR 150_69                                                                          | P112                                                                                | BN112M6                                                                                 | 152                                                                                 |
| 14.1        | 969      | 1.2 | 100 | 14700    |                                                                                   |                                                                                   |                                                                                   | VF 150_100                                                                          | P100                                                                                | BN100LA4                                                                                | 150                                                                                 |
| 14.1        | 969      | 2.0 | 100 | 18000    |                                                                                   |                                                                                   |                                                                                   | VF 185_100                                                                          | P100                                                                                | BN100LA4                                                                                | 158                                                                                 |
| 14.7        | 973      | 1.1 | 64  | 13200    |                                                                                   |                                                                                   |                                                                                   | VF 130_64                                                                           | P112                                                                                | BN112M6                                                                                 | 142                                                                                 |
| 15.7        | 952      | 1.6 | 90  | 13800    | —                                                                                 | —                                                                                 |                                                                                   | VFR 130_90                                                                          | P100                                                                                | BN100LA4                                                                                | 144                                                                                 |
| 15.7        | 966      | 2.0 | 90  | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_90                                                                          | P100                                                                                | BN100LA4                                                                                | 152                                                                                 |
| 15.7        | 952      | 2.7 | 60  | 19000    |                                                                                   |                                                                                   |                                                                                   | VF 185_60                                                                           | P112                                                                                | BN112M6                                                                                 | 158                                                                                 |
| 15.7        | 1019     | 2.7 | 90  | 19500    |                                                                                   |                                                                                   |                                                                                   | VFR 185_90                                                                          | P100                                                                                | BN100LA4                                                                                | 160                                                                                 |
| 16.8        | 876      | 1.2 | 56  | 13200    | —                                                                                 | —                                                                                 |                                                                                   | VF 130_56                                                                           | P112                                                                                | BN112M6                                                                                 | 142                                                                                 |
| 17.6        | 811      | 1.1 | 80  | 12600    |                                                                                   |                                                                                   |                                                                                   | VF 130_80                                                                           | P100                                                                                | BN100LA4                                                                                | 142                                                                                 |
| 17.6        | 823      | 1.5 | 80  | 14700    |                                                                                   |                                                                                   |                                                                                   | VF 150_80                                                                           | P100                                                                                | BN100LA4                                                                                | 150                                                                                 |
| 17.6        | 823      | 2.6 | 80  | 18000    |                                                                                   |                                                                                   |                                                                                   | VF 185_80                                                                           | P100                                                                                | BN100LA4                                                                                | 158                                                                                 |
| 20.4        | 751      | 1.5 | 46  | 13200    | —                                                                                 | —                                                                                 |                                                                                   | VF 130_46                                                                           | P112                                                                                | BN112M6                                                                                 | 142                                                                                 |
| 20.4        | 781      | 1.7 | 69  | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_69                                                                          | P100                                                                                | BN100LA4                                                                                | 144                                                                                 |
| 20.4        | 761      | 2.3 | 46  | 15500    |                                                                                   |                                                                                   |                                                                                   | VF 150_46                                                                           | P112                                                                                | BN112M6                                                                                 | 150                                                                                 |
| 20.4        | 792      | 2.3 | 69  | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_69                                                                          | P100                                                                                | BN100LA4                                                                                | 152                                                                                 |
| 20.9        | 774      | 1.1 | 45  | 8000     | —                                                                                 | —                                                                                 |                                                                                   | WR 110_45                                                                           | P112                                                                                | BN112M6                                                                                 | 140                                                                                 |
| 22.0        | 677      | 1.4 | 64  | 12600    |                                                                                   |                                                                                   |                                                                                   | VF 130_64                                                                           | P100                                                                                | BN100LA4                                                                                | 142                                                                                 |
| 22.0        | 687      | 1.9 | 64  | 14700    |                                                                                   |                                                                                   |                                                                                   | VF 150_64                                                                           | P100                                                                                | BN100LA4                                                                                | 150                                                                                 |
| 23.3        | 660      | 1.1 | 40  | 8000     |                                                                                   |                                                                                   |                                                                                   | W 110_40                                                                            | P112                                                                                | BN112M6                                                                                 | 139                                                                                 |
| 23.5        | 706      | 1.0 | 60  | 8000     | —                                                                                 | —                                                                                 | 138                                                                               | WR 110_60                                                                           | P100                                                                                | BN100LA4                                                                                | 140                                                                                 |
| 23.5        | 697      | 1.9 | 60  | 13800    |                                                                                   |                                                                                   |                                                                                   | VFR 130_60                                                                          | P100                                                                                | BN100LA4                                                                                | 144                                                                                 |
| 23.5        | 706      | 2.7 | 60  | 16000    |                                                                                   |                                                                                   |                                                                                   | VFR 150_60                                                                          | P100                                                                                | BN100LA4                                                                                | 152                                                                                 |
| 23.5        | 662      | 3.4 | 60  | 18000    |                                                                                   |                                                                                   |                                                                                   | VF 185_60                                                                           | P100                                                                                | BN100LA4                                                                                | 158                                                                                 |
| 25.2        | 601      | 1.0 | 56  | 8000     | W 110_56                                                                          | S3                                                                                | M3LA4                                                                             | W 110_56                                                                            | P100                                                                                | BN100LA4                                                                                | 139                                                                                 |
| 25.2        | 609      | 1.6 | 56  | 12600    |                                                                                   |                                                                                   |                                                                                   | VF 130_56                                                                           | P100                                                                                | BN100LA4                                                                                | 142                                                                                 |
| 25.2        | 617      | 2.2 | 56  | 14200    |                                                                                   |                                                                                   |                                                                                   | VF 150_56                                                                           | P100                                                                                | BN100LA4                                                                                | 150                                                                                 |
| 31          | 507      | 1.2 | 46  | 8000     |                                                                                   |                                                                                   |                                                                                   | W 110_46                                                                            | S3                                                                                  | M3LA4                                                                                   | 138                                                                                 |
| 31          | 521      | 2.0 | 46  | 12600    | —                                                                                 | —                                                                                 |                                                                                   | VF 130_46                                                                           | P100                                                                                | BN100LA4                                                                                | 142                                                                                 |
|             |          |     |     |          |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                         |                                                                                     |

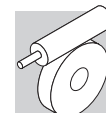


## 2.2 kW

| n2<br>min-1 | M2<br>Nm | S   | i  | Rn2<br>N |  |  |  |  |  | IEC  |  |     |
|-------------|----------|-----|----|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|
| 31          | 528      | 2.9 | 46 | 14700    | —                                                                                 |                                                                                   |                                                                                   | VF 150_46                                                                           | P100                                                                                | BN100LA4                                                                                | 150                                                                                 |     |
| 31          | 536      | 1.3 | 45 | 8000     | —                                                                                 |                                                                                   |                                                                                   | WR 110_45                                                                           | P100                                                                                | BN100LA4                                                                                | 140                                                                                 |     |
| 31          | 550      | 3.1 | 45 | 16000    | —                                                                                 |                                                                                   |                                                                                   | VFR 150_45                                                                          | P100                                                                                | BN100LA4                                                                                | 152                                                                                 |     |
| 35          | 453      | 1.5 | 40 | 8000     | W 110_40                                                                          | S3                                                                                | M3LA4                                                                             | 138                                                                                 | W 110_40                                                                            | P100                                                                                    | BN100LA4                                                                            | 139 |
| 35          | 453      | 2.4 | 40 | 12600    | —                                                                                 |                                                                                   |                                                                                   | VF 130_40                                                                           | P100                                                                                | BN100LA4                                                                                | 142                                                                                 |     |
| 35          | 459      | 3.4 | 40 | 14700    | —                                                                                 |                                                                                   |                                                                                   | VF 150_40                                                                           | P100                                                                                | BN100LA4                                                                                | 150                                                                                 |     |
| 41          | 416      | 2.5 | 23 | 13200    | —                                                                                 |                                                                                   |                                                                                   | VF 130_23                                                                           | P112                                                                                | BN112M6                                                                                 | 142                                                                                 |     |
| 47          | 340      | 1.1 | 30 | 7000     | W 86_30                                                                           | S3                                                                                | M3LA4                                                                             | 134                                                                                 | W 86_30                                                                             | P100                                                                                    | BN100LA4                                                                            | 135 |
| 47          | 344      | 2.0 | 30 | 8000     | W 110_30                                                                          | S3                                                                                | M3LA4                                                                             | 138                                                                                 | W 110_30                                                                            | P100                                                                                    | BN100LA4                                                                            | 139 |
| 47          | 353      | 3.0 | 30 | 12600    | —                                                                                 |                                                                                   |                                                                                   | VF 130_30                                                                           | P100                                                                                | BN100LA4                                                                                | 142                                                                                 |     |
| 61          | 281      | 1.1 | 23 | 6990     | W 86_23                                                                           | S3                                                                                | M3LA4                                                                             | 134                                                                                 | W 86_23                                                                             | P100                                                                                    | BN100LA4                                                                            | 135 |
| 61          | 284      | 1.9 | 23 | 8000     | W 110_23                                                                          | S3                                                                                | M3LA4                                                                             | 138                                                                                 | W 110_23                                                                            | P100                                                                                    | BN100LA4                                                                            | 139 |
| 61          | 284      | 3.1 | 23 | 12600    | —                                                                                 |                                                                                   |                                                                                   | VF 130_23                                                                           | P100                                                                                | BN100LA4                                                                                | 142                                                                                 |     |
| 71          | 247      | 1.0 | 20 | 3410     | W 75_20                                                                           | S3                                                                                | M3LA4                                                                             | 130                                                                                 | W 75_20                                                                             | P100                                                                                    | BN100LA4                                                                            | 131 |
| 71          | 250      | 1.3 | 20 | 6730     | W 86_20                                                                           | S3                                                                                | M3LA4                                                                             | 134                                                                                 | W 86_20                                                                             | P100                                                                                    | BN100LA4                                                                            | 135 |
| 71          | 250      | 2.3 | 20 | 8000     | W 110_20                                                                          | S3                                                                                | M3LA4                                                                             | 138                                                                                 | W 110_20                                                                            | P100                                                                                    | BN100LA4                                                                            | 139 |
| 94          | 190      | 1.3 | 15 | 3240     | W 75_15                                                                           | S3                                                                                | M3LA4                                                                             | 130                                                                                 | W 75_15                                                                             | P100                                                                                    | BN100LA4                                                                            | 131 |
| 94          | 190      | 1.7 | 15 | 6270     | W 86_15                                                                           | S3                                                                                | M3LA4                                                                             | 134                                                                                 | W 86_15                                                                             | P100                                                                                    | BN100LA4                                                                            | 135 |
| 94          | 188      | 3.2 | 15 | 8000     | W 110_15                                                                          | S3                                                                                | M3LA4                                                                             | 138                                                                                 | W 110_15                                                                            | P100                                                                                    | BN100LA4                                                                            | 139 |
| 133         | 139      | 1.5 | 7  | 2780     | W 75_7                                                                            | S3                                                                                | M3LC6                                                                             | 130                                                                                 | W 75_7                                                                              | P112                                                                                    | BN112M6                                                                             | 131 |
| 133         | 139      | 1.9 | 7  | 5540     | W 86_7                                                                            | S3                                                                                | M3LC6                                                                             | 134                                                                                 | W 86_7                                                                              | P112                                                                                    | BN112M6                                                                             | 135 |
| 141         | 131      | 1.8 | 10 | 2940     | W 75_10                                                                           | S3                                                                                | M3LA4                                                                             | 130                                                                                 | W 75_10                                                                             | P100                                                                                    | BN100LA4                                                                            | 131 |
| 141         | 131      | 2.2 | 10 | 5590     | W 86_10                                                                           | S3                                                                                | M3LA4                                                                             | 134                                                                                 | W 86_10                                                                             | P100                                                                                    | BN100LA4                                                                            | 135 |
| 187         | 99       | 2.3 | 15 | 2920     | W 75_15                                                                           | S3                                                                                | M3SA2                                                                             | 130                                                                                 | W 75_15                                                                             | P90                                                                                     | BN90L2                                                                              | 131 |
| 187         | 98       | 3.0 | 15 | 5290     | W 86_15                                                                           | S3                                                                                | M3SA2                                                                             | 134                                                                                 | W 86_15                                                                             | P90                                                                                     | BN90L2                                                                              | 135 |
| 192         | 94       | 1.3 | 15 | 1980     | —                                                                                 |                                                                                   |                                                                                   | W 63_15                                                                             | P90                                                                                 | BN90L2                                                                                  | 126                                                                                 |     |
| 201         | 94       | 2.0 | 7  | 2660     | W 75_7                                                                            | S3                                                                                | M3LA4                                                                             | 130                                                                                 | W 75_7                                                                              | P100                                                                                    | BN100LA4                                                                            | 131 |
| 201         | 93       | 2.7 | 7  | 5030     | W 86_7                                                                            | S3                                                                                | M3LA4                                                                             | 134                                                                                 | W 86_7                                                                              | P100                                                                                    | BN100LA4                                                                            | 135 |
| 240         | 76       | 1.6 | 12 | 1890     | —                                                                                 |                                                                                   |                                                                                   | W 63_12                                                                             | P90                                                                                 | BN90L2                                                                                  | 126                                                                                 |     |
| 281         | 67       | 3.0 | 10 | 2610     | W 75_10                                                                           | S3                                                                                | M3SA2                                                                             | 130                                                                                 | W 75_10                                                                             | P90                                                                                     | BN90L2                                                                              | 131 |
| 288         | 64       | 1.9 | 10 | 1820     | —                                                                                 |                                                                                   |                                                                                   | W 63_10                                                                             | P90                                                                                 | BN90L2                                                                                  | 126                                                                                 |     |
| 401         | 48       | 3.6 | 7  | 2350     | W 75_7                                                                            | S3                                                                                | M3SA2                                                                             | 130                                                                                 | W 75_7                                                                              | P90                                                                                     | BN90L2                                                                              | 131 |
| 411         | 46       | 2.3 | 7  | 1660     | —                                                                                 |                                                                                   |                                                                                   | W 63_7                                                                              | P90                                                                                 | BN90L2                                                                                  | 126                                                                                 |     |

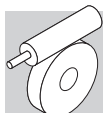
## 3 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i    | Rn <sub>2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|------|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 0.88                    | 10403                | 0.9 | 1600 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_1600                                                                    | P100                                                                                  | BN100LB4                                                                                  | 176                                                                                   |
| 1.0                     | 9814                 | 0.9 | 920  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_920                                                                     | P132                                                                                  | BN132S6                                                                                   | 176                                                                                   |
| 1.2                     | 8534                 | 1.1 | 1200 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_1200                                                                    | P100                                                                                  | BN100LB4                                                                                  | 176                                                                                   |
| 1.5                     | 6917                 | 0.9 | 920  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_920                                                                     | P100                                                                                  | BN100LB4                                                                                  | 170                                                                                   |
| 1.5                     | 6917                 | 1.3 | 920  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_920                                                                     | P100                                                                                  | BN100LB4                                                                                  | 176                                                                                   |
| 1.8                     | 6665                 | 0.9 | 800  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_800                                                                     | P100                                                                                  | BN100LB4                                                                                  | 170                                                                                   |
| 1.8                     | 6827                 | 1.3 | 800  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_800                                                                     | P100                                                                                  | BN100LB4                                                                                  | 176                                                                                   |
| 2.4                     | 5242                 | 1.2 | 600  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_600                                                                     | P100                                                                                  | BN100LB4                                                                                  | 170                                                                                   |
| 2.4                     | 5364                 | 1.7 | 600  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_600                                                                     | P100                                                                                  | BN100LB4                                                                                  | 176                                                                                   |
| 3.1                     | 4755                 | 1.1 | 300  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VFR 250_300                                                                           | P132                                                                                  | BN132S6                                                                                   | 174                                                                                   |
| 3.5                     | 3901                 | 1.1 | 400  | 19500                | —                                                                                   | —                                                                                   | —                                                                                   | W /VF 86/185_400                                                                      | P100                                                                                  | BN100LB4                                                                                  | 162                                                                                   |
| 3.5                     | 4064                 | 1.6 | 400  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_400                                                                     | P100                                                                                  | BN100LB4                                                                                  | 170                                                                                   |
| 3.5                     | 3983                 | 2.3 | 400  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_400                                                                     | P100                                                                                  | BN100LB4                                                                                  | 176                                                                                   |
| 3.9                     | 3950                 | 1.1 | 240  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VFR 210_240                                                                           | P132                                                                                  | BN132S6                                                                                   | 168                                                                                   |
| 3.9                     | 4096                 | 1.4 | 240  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VFR 250_240                                                                           | P132                                                                                  | BN132S6                                                                                   | 174                                                                                   |
| 4.7                     | 3353                 | 1.0 | 300  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VFR 210_300                                                                           | P100                                                                                  | BN100LB4                                                                                  | 168                                                                                   |
| 4.7                     | 3475                 | 1.4 | 300  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VFR 250_300                                                                           | P100                                                                                  | BN100LB4                                                                                  | 174                                                                                   |
| 5.0                     | 2958                 | 1.4 | 280  | 19500                | —                                                                                   | —                                                                                   | —                                                                                   | W /VF 86/185_280                                                                      | P100                                                                                  | BN100LB4                                                                                  | 162                                                                                   |
| 5.0                     | 2958                 | 2.1 | 280  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_280                                                                     | P100                                                                                  | BN100LB4                                                                                  | 170                                                                                   |
| 5.0                     | 3015                 | 3.0 | 280  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_280                                                                     | P100                                                                                  | BN100LB4                                                                                  | 176                                                                                   |
| 5.9                     | 2877                 | 1.0 | 240  | 19500                | —                                                                                   | —                                                                                   | —                                                                                   | VFR 185_240                                                                           | P100                                                                                  | BN100LB4                                                                                  | 160                                                                                   |
| 5.9                     | 2877                 | 1.4 | 240  | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VFR 210_240                                                                           | P100                                                                                  | BN100LB4                                                                                  | 168                                                                                   |
| 5.9                     | 2975                 | 1.8 | 240  | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VFR 250_240                                                                           | P100                                                                                  | BN100LB4                                                                                  | 174                                                                                   |
| 7.8                     | 2377                 | 1.3 | 180  | 19500                | —                                                                                   | —                                                                                   | —                                                                                   | VFR 185_180                                                                           | P100                                                                                  | BN100LB4                                                                                  | 160                                                                                   |



## 3 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i   | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |     |         |      |          |     |
|-------------------------|----------------------|-----|-----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|---------|------|----------|-----|
| 7.8                     | 2341                 | 1.8 | 180 | 34500                | —                                                                                 |                                                                                   |                                                                                   | VFR 210_180                                                                         | P100                                                                                | BN100LB4                                                                                | 168                                                                                 |     |         |      |          |     |
| 7.8                     | 2450                 | 2.6 | 180 | 52000                | —                                                                                 |                                                                                   |                                                                                   | VFR 250_180                                                                         | P100                                                                                | BN100LB4                                                                                | 174                                                                                 |     |         |      |          |     |
| 9.4                     | 1859                 | 1.6 | 100 | 33000                | —                                                                                 |                                                                                   |                                                                                   | VF 210_100                                                                          | P132                                                                                | BN132S6                                                                                 | 166                                                                                 |     |         |      |          |     |
| 9.4                     | 2042                 | 1.6 | 150 | 19500                | —                                                                                 |                                                                                   |                                                                                   | VFR 185_150                                                                         | P100                                                                                | BN100LB4                                                                                | 160                                                                                 |     |         |      |          |     |
| 9.4                     | 2042                 | 2.2 | 150 | 34500                | —                                                                                 |                                                                                   |                                                                                   | VFR 210_150                                                                         | P100                                                                                | BN100LB4                                                                                | 168                                                                                 |     |         |      |          |     |
| 9.4                     | 1920                 | 2.5 | 100 | 50000                | —                                                                                 |                                                                                   |                                                                                   | VF 250_100                                                                          | P132                                                                                | BN132S6                                                                                 | 172                                                                                 |     |         |      |          |     |
| 9.4                     | 2042                 | 3.2 | 150 | 52000                | —                                                                                 |                                                                                   |                                                                                   | VFR 250_150                                                                         | P100                                                                                | BN100LB4                                                                                | 174                                                                                 |     |         |      |          |     |
| 10.2                    | 1907                 | 1.0 | 138 | 16000                | —                                                                                 |                                                                                   |                                                                                   | VFR 150_138                                                                         | P100                                                                                | BN100LB4                                                                                | 152                                                                                 |     |         |      |          |     |
| 11.8                    | 1634                 | 0.9 | 120 | 13800                | —                                                                                 |                                                                                   |                                                                                   | VFR 130_120                                                                         | P100                                                                                | BN100LB4                                                                                | 144                                                                                 |     |         |      |          |     |
| 11.8                    | 1658                 | 1.2 | 120 | 16000                | —                                                                                 |                                                                                   |                                                                                   | VFR 150_120                                                                         | P100                                                                                | BN100LB4                                                                                | 152                                                                                 |     |         |      |          |     |
| 11.8                    | 1609                 | 1.5 | 80  | 19000                | —                                                                                 |                                                                                   |                                                                                   | VF 185_80                                                                           | P132                                                                                | BN132S6                                                                                 | 158                                                                                 |     |         |      |          |     |
| 11.8                    | 1585                 | 2.1 | 80  | 33000                | —                                                                                 |                                                                                   |                                                                                   | VF 210_80                                                                           | P132                                                                                | BN132S6                                                                                 | 166                                                                                 |     |         |      |          |     |
| 11.8                    | 1707                 | 2.1 | 120 | 19500                | —                                                                                 |                                                                                   |                                                                                   | VFR 185_120                                                                         | P100                                                                                | BN100LB4                                                                                | 160                                                                                 |     |         |      |          |     |
| 11.8                    | 1707                 | 2.9 | 120 | 34500                | —                                                                                 |                                                                                   |                                                                                   | VFR 210_120                                                                         | P100                                                                                | BN100LB4                                                                                | 168                                                                                 |     |         |      |          |     |
| 11.8                    | 1634                 | 3.2 | 80  | 50000                | —                                                                                 |                                                                                   |                                                                                   | VF 250_80                                                                           | P132                                                                                | BN132S6                                                                                 | 172                                                                                 |     |         |      |          |     |
| 11.8                    | 1731                 | 4.0 | 120 | 52000                | —                                                                                 |                                                                                   |                                                                                   | VFR 250_120                                                                         | P100                                                                                | BN100LB4                                                                                | 174                                                                                 |     |         |      |          |     |
| 14.1                    | 1321                 | 0.9 | 100 | 14700                | —                                                                                 |                                                                                   |                                                                                   | VF 150_100                                                                          | P100                                                                                | BN100LB4                                                                                | 150                                                                                 |     |         |      |          |     |
| 14.1                    | 1321                 | 1.4 | 100 | 18000                | —                                                                                 |                                                                                   |                                                                                   | VF 185_100                                                                          | P100                                                                                | BN100LB4                                                                                | 158                                                                                 |     |         |      |          |     |
| 15.7                    | 1298                 | 1.2 | 90  | 13800                | —                                                                                 |                                                                                   |                                                                                   | VFR 130_90                                                                          | P100                                                                                | BN100LB4                                                                                | 144                                                                                 |     |         |      |          |     |
| 15.7                    | 1317                 | 1.5 | 90  | 16000                | —                                                                                 |                                                                                   |                                                                                   | VFR 150_90                                                                          | P100                                                                                | BN100LB4                                                                                | 152                                                                                 |     |         |      |          |     |
| 15.7                    | 1298                 | 2.0 | 60  | 19000                | —                                                                                 |                                                                                   |                                                                                   | VF 185_60                                                                           | P132                                                                                | BN132S6                                                                                 | 158                                                                                 |     |         |      |          |     |
| 15.7                    | 1390                 | 2.0 | 90  | 19500                | —                                                                                 |                                                                                   |                                                                                   | VFR 185_90                                                                          | P100                                                                                | BN100LB4                                                                                | 160                                                                                 |     |         |      |          |     |
| 15.7                    | 1390                 | 2.9 | 90  | 34500                | —                                                                                 |                                                                                   |                                                                                   | VFR 210_90                                                                          | P100                                                                                | BN100LB4                                                                                | 168                                                                                 |     |         |      |          |     |
| 15.7                    | 1280                 | 2.9 | 60  | 33000                | —                                                                                 |                                                                                   |                                                                                   | VF 210_60                                                                           | P132                                                                                | BN132S6                                                                                 | 166                                                                                 |     |         |      |          |     |
| 17.6                    | 1122                 | 1.1 | 80  | 14700                | —                                                                                 |                                                                                   |                                                                                   | VF 150_80                                                                           | P100                                                                                | BN100LB4                                                                                | 150                                                                                 |     |         |      |          |     |
| 17.6                    | 1122                 | 1.9 | 80  | 18000                | —                                                                                 |                                                                                   |                                                                                   | VF 185_80                                                                           | P100                                                                                | BN100LB4                                                                                | 158                                                                                 |     |         |      |          |     |
| 20.4                    | 1066                 | 1.2 | 69  | 13800                | —                                                                                 |                                                                                   |                                                                                   | VFR 130_69                                                                          | P100                                                                                | BN100LB4                                                                                | 144                                                                                 |     |         |      |          |     |
| 20.4                    | 1080                 | 1.7 | 69  | 16000                | —                                                                                 |                                                                                   |                                                                                   | VFR 150_69                                                                          | P100                                                                                | BN100LB4                                                                                | 152                                                                                 |     |         |      |          |     |
| 22.0                    | 923                  | 1.0 | 64  | 12600                | —                                                                                 |                                                                                   |                                                                                   | VF 130_64                                                                           | P100                                                                                | BN100LB4                                                                                | 142                                                                                 |     |         |      |          |     |
| 22.0                    | 936                  | 1.4 | 64  | 14700                | —                                                                                 |                                                                                   |                                                                                   | VF 150_64                                                                           | P100                                                                                | BN100LB4                                                                                | 150                                                                                 |     |         |      |          |     |
| 23.5                    | 951                  | 1.4 | 60  | 13800                | —                                                                                 |                                                                                   |                                                                                   | VFR 130_60                                                                          | P100                                                                                | BN100LB4                                                                                | 144                                                                                 |     |         |      |          |     |
| 23.5                    | 963                  | 2.0 | 60  | 16000                | —                                                                                 |                                                                                   |                                                                                   | VFR 150_60                                                                          | P100                                                                                | BN100LB4                                                                                | 152                                                                                 |     |         |      |          |     |
| 23.5                    | 902                  | 2.5 | 60  | 18000                | —                                                                                 |                                                                                   |                                                                                   | VF 185_60                                                                           | P100                                                                                | BN100LB4                                                                                | 158                                                                                 |     |         |      |          |     |
| 25.2                    | 831                  | 1.2 | 56  | 12600                | —                                                                                 |                                                                                   |                                                                                   | VF 130_56                                                                           | P100                                                                                | BN100LB4                                                                                | 142                                                                                 |     |         |      |          |     |
| 25.2                    | 842                  | 1.6 | 56  | 14700                | —                                                                                 |                                                                                   |                                                                                   | VF 150_56                                                                           | P100                                                                                | BN100LB4                                                                                | 150                                                                                 |     |         |      |          |     |
| 28.2                    | 772                  | 3.2 | 50  | 18000                | —                                                                                 |                                                                                   |                                                                                   | VF 185_50                                                                           | P100                                                                                | BN100LB4                                                                                | 158                                                                                 |     |         |      |          |     |
| 31                      | 710                  | 1.5 | 46  | 12600                | —                                                                                 |                                                                                   |                                                                                   | VF 130_46                                                                           | P100                                                                                | BN100LB4                                                                                | 142                                                                                 |     |         |      |          |     |
| 31                      | 720                  | 2.2 | 46  | 14700                | —                                                                                 |                                                                                   |                                                                                   | VF 150_46                                                                           | P100                                                                                | BN100LB4                                                                                | 150                                                                                 |     |         |      |          |     |
| 31                      | 731                  | 1.0 | 45  | 8000                 | —                                                                                 |                                                                                   |                                                                                   | WR 110_45                                                                           | P100                                                                                | BN100LB4                                                                                | 140                                                                                 |     |         |      |          |     |
| 31                      | 677                  | 1.1 | 30  | 8000                 | —                                                                                 |                                                                                   |                                                                                   | W 110_30                                                                            | P132                                                                                | BN132S6                                                                                 | 138                                                                                 |     |         |      |          |     |
| 31                      | 750                  | 2.3 | 45  | 16000                | —                                                                                 |                                                                                   |                                                                                   | VFR 150_45                                                                          | P100                                                                                | BN100LB4                                                                                | 152                                                                                 |     |         |      |          |     |
| 31                      | 741                  | 3.2 | 30  | 19000                | —                                                                                 |                                                                                   |                                                                                   | VF 185_30                                                                           | P132                                                                                | BN132S6                                                                                 | 158                                                                                 |     |         |      |          |     |
| 35                      | 618                  | 1.1 | 40  | 8000                 | W 110_40                                                                          | S3                                                                                | M3LB4                                                                             | 138                                                                                 | W 110_40                                                                            | P100                                                                                    | BN100LB4                                                                            | 139 |         |      |          |     |
| 35                      | 618                  | 1.8 | 40  | 12600                |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 130_40                                                                           | P100                                                                                    | BN100LB4                                                                            | 142 |         |      |          |     |
| 35                      | 626                  | 2.5 | 40  | 14700                |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 150_40                                                                           | P100                                                                                    | BN100LB4                                                                            | 150 |         |      |          |     |
| 41                      | 568                  | 1.0 | 23  | 8000                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     | W 110_23                                                                            | P132                                                                                    | BN132S6                                                                             | 138 |         |      |          |     |
| 41                      | 568                  | 1.8 | 23  | 13200                | —                                                                                 |                                                                                   |                                                                                   | VF 130_23                                                                           | P132                                                                                | BN132S6                                                                                 | 142                                                                                 |     |         |      |          |     |
| 41                      | 575                  | 2.6 | 23  | 15500                | —                                                                                 |                                                                                   |                                                                                   | VF 150_23                                                                           | P132                                                                                | BN132S6                                                                                 | 150                                                                                 |     |         |      |          |     |
| 47                      | 469                  | 1.5 | 30  | 8000                 | W 110_30                                                                          | S3                                                                                | M3LB4                                                                             | 138                                                                                 | W 110_30                                                                            | P100                                                                                    | BN100LB4                                                                            | 139 |         |      |          |     |
| 47                      | 482                  | 2.2 | 30  | 12600                |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 130_30                                                                           | P100                                                                                    | BN100LB4                                                                            | 142 |         |      |          |     |
| 47                      | 488                  | 2.8 | 30  | 14700                |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 150_30                                                                           | P100                                                                                    | BN100LB4                                                                            | 150 |         |      |          |     |
| 47                      | 518                  | 2.9 | 30  | 16000                |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VFR 150_30                                                                          | P100                                                                                    | BN100LB4                                                                            | 152 |         |      |          |     |
| 61                      | 388                  | 1.4 | 23  | 8000                 | W 110_23                                                                          | S3                                                                                | M3LB4                                                                             | 138                                                                                 | W 110_23                                                                            | P100                                                                                    | BN100LB4                                                                            | 139 |         |      |          |     |
| 61                      | 388                  | 2.3 | 23  | 12600                |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 130_23                                                                           | P100                                                                                    | BN100LB4                                                                            | 142 |         |      |          |     |
| 61                      | 388                  | 3.3 | 23  | 14700                |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 150_23                                                                           | P100                                                                                    | BN100LB4                                                                            | 150 |         |      |          |     |
| 71                      | 341                  | 0.9 | 20  | 6240                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     | W 86_20                                                                             | S3                                                                                      | M3LB4                                                                               | 134 | W 86_20 | P100 | BN100LB4 | 135 |
| 71                      | 341                  | 1.7 | 20  | 8000                 | W 110_20                                                                          | S3                                                                                | M3LB4                                                                             | 138                                                                                 | W 110_20                                                                            | P100                                                                                    | BN100LB4                                                                            | 139 |         |      |          |     |
| 71                      | 341                  | 2.6 | 20  | 12600                |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 130_20                                                                           | P100                                                                                    | BN100LB4                                                                            | 142 |         |      |          |     |
| 94                      | 259                  | 1.0 | 15  | 2800                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     | W 75_15                                                                             | S3                                                                                      | M3LB4                                                                               | 130 | W 75_15 | P100 | BN100LB4 | 131 |
| 94                      | 259                  | 1.3 | 15  | 5890                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     | W 86_15                                                                             | S3                                                                                      | M3LB4                                                                               | 134 | W 86_15 | P100 | BN100LB4 | 135 |
| 94                      | 256                  | 2.3 | 15  | 8000                 | W 110_15                                                                          | S3                                                                                | M3LB4                                                                             | 138                                                                                 | W 110_15                                                                            | P100                                                                                    | BN100LB4                                                                            | 139 |         |      |          |     |
| 94                      | 262                  | 3.5 | 15  | 11800                |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 130_15                                                                           | P100                                                                                    | BN100LB4                                                                            | 142 |         |      |          |     |
| 124                     | 198                  | 3.4 | 23  | 11000                |                                                                                   |                                                                                   |                                                                                   |                                                                                     | VF 130_23                                                                           | P100                                                                                    | BN100L2                                                                             | 142 |         |      |          |     |
| 141                     | 179                  | 1.3 | 10  | 2600                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     | W 75_10                                                                             | S3                                                                                      | M3LB4                                                                               | 130 | W 75_10 | P100 | BN100LB4 | 131 |
| 141                     | 179                  | 1.6 | 10  | 5300                 | W 86_10                                                                           | S3                                                                                | M3LB4                                                                             | 134                                                                                 | W 86_10                                                                             | P100                                                                                    | BN100LB4                                                                            | 135 |         |      |          |     |

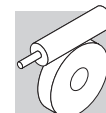


### 3 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |   |    |       |  |   | IEC  |          |  |
|-------------------------------------|----------------------|-----|----|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------|
| 141                                 | 177                  | 3.1 | 10 | 8000                 | W 110_10                                                                                                                                                            | S3 | M3LB4 | 138                                                                               | W 110_10                                                                                                                                                                | P100                                                                                    | BN100LB4 | 139                                                                                 |
| 191                                 | 132                  | 1.7 | 15 | 2680                 | W 75_15                                                                                                                                                             | S3 | M3LA2 | 130                                                                               | W 75_15                                                                                                                                                                 | P100                                                                                    | BN100L2  | 131                                                                                 |
| 191                                 | 131                  | 2.3 | 15 | 5070                 | W 86_15                                                                                                                                                             | S3 | M3LA2 | 134                                                                               | W 86_15                                                                                                                                                                 | P100                                                                                    | BN100L2  | 135                                                                                 |
| 201                                 | 128                  | 1.5 | 7  | 2380                 | W 75_7                                                                                                                                                              | S3 | M3LB4 | 130                                                                               | W 75_7                                                                                                                                                                  | P100                                                                                    | BN100LB4 | 131                                                                                 |
| 201                                 | 127                  | 2.0 | 7  | 4780                 | W 86_7                                                                                                                                                              | S3 | M3LB4 | 134                                                                               | W 86_7                                                                                                                                                                  | P100                                                                                    | BN100LB4 | 135                                                                                 |
| 286                                 | 90                   | 2.3 | 10 | 2430                 | W 75_10                                                                                                                                                             | S3 | M3LA2 | 130                                                                               | W 75_10                                                                                                                                                                 | P100                                                                                    | BN100L2  | 131                                                                                 |
| 286                                 | 90                   | 2.9 | 10 | 4510                 | W 86_10                                                                                                                                                             | S3 | M3LA2 | 134                                                                               | W 86_10                                                                                                                                                                 | P100                                                                                    | BN100L2  | 135                                                                                 |
| 409                                 | 64                   | 2.7 | 7  | 2190                 | W 75_7                                                                                                                                                              | S3 | M3LA2 | 130                                                                               | W 75_7                                                                                                                                                                  | P100                                                                                    | BN100L2  | 131                                                                                 |
| 409                                 | 64                   | 3.5 | 7  | 4040                 | W 86_7                                                                                                                                                              | S3 | M3LA2 | 134                                                                               | W 86_7                                                                                                                                                                  | P100                                                                                    | BN100L2  | 135                                                                                 |

### 4 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i   | Rn <sub>2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|-----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1.5                     | 9157                 | 1.0 | 920 | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 130/250_920                                                                   | P112                                                                                | BN112M4                                                                                 | 176                                                                                 |
| 1.8                     | 9039                 | 1.0 | 800 | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 130/250_800                                                                   | P112                                                                                | BN112M4                                                                                 | 176                                                                                 |
| 2.4                     | 6941                 | 0.9 | 600 | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 130/210_600                                                                   | P112                                                                                | BN112M4                                                                                 | 170                                                                                 |
| 2.4                     | 7102                 | 1.3 | 600 | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 130/250_600                                                                   | P112                                                                                | BN112M4                                                                                 | 176                                                                                 |
| 3.6                     | 5380                 | 1.2 | 400 | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 130/210_400                                                                   | P112                                                                                | BN112M4                                                                                 | 170                                                                                 |
| 3.6                     | 5273                 | 1.7 | 400 | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 130/250_400                                                                   | P112                                                                                | BN112M4                                                                                 | 176                                                                                 |
| 4.0                     | 5404                 | 1.1 | 240 | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_240                                                                         | P132                                                                                | BN132MA6                                                                                | 174                                                                                 |
| 4.7                     | 4600                 | 1.1 | 300 | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_300                                                                         | P112                                                                                | BN112M4                                                                                 | 174                                                                                 |
| 5.1                     | 3917                 | 1.1 | 280 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | W /VF 86/185_280                                                                    | P112                                                                                | BN112M4                                                                                 | 162                                                                                 |
| 5.1                     | 3917                 | 1.6 | 280 | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 130/210_280                                                                   | P112                                                                                | BN112M4                                                                                 | 170                                                                                 |
| 5.1                     | 3992                 | 2.3 | 280 | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 130/250_280                                                                   | P112                                                                                | BN112M4                                                                                 | 176                                                                                 |
| 5.3                     | 3908                 | 1.3 | 180 | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_180                                                                         | P132                                                                                | BN132MA6                                                                                | 168                                                                                 |
| 5.3                     | 4487                 | 1.5 | 180 | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_180                                                                         | P132                                                                                | BN132MA6                                                                                | 174                                                                                 |
| 5.9                     | 3809                 | 1.0 | 240 | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_240                                                                         | P112                                                                                | BN112M4                                                                                 | 168                                                                                 |
| 5.9                     | 3938                 | 1.4 | 240 | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_240                                                                         | P112                                                                                | BN112M4                                                                                 | 174                                                                                 |
| 7.9                     | 3147                 | 1.0 | 180 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 185_180                                                                         | P112                                                                                | BN112M4                                                                                 | 160                                                                                 |
| 7.9                     | 3099                 | 1.4 | 180 | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_180                                                                         | P112                                                                                | BN112M4                                                                                 | 168                                                                                 |
| 7.9                     | 3244                 | 1.9 | 180 | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_180                                                                         | P112                                                                                | BN112M4                                                                                 | 174                                                                                 |
| 9.5                     | 2704                 | 1.2 | 150 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 185_150                                                                         | P112                                                                                | BN112M4                                                                                 | 160                                                                                 |
| 9.5                     | 2704                 | 1.7 | 150 | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_150                                                                         | P112                                                                                | BN112M4                                                                                 | 168                                                                                 |
| 9.5                     | 2704                 | 2.4 | 150 | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_150                                                                         | P112                                                                                | BN112M4                                                                                 | 174                                                                                 |
| 9.5                     | 2453                 | 1.2 | 100 | 33000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_100                                                                          | P132                                                                                | BN132MA6                                                                                | 166                                                                                 |
| 9.5                     | 2533                 | 1.9 | 100 | 50000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_100                                                                          | P132                                                                                | BN132MA6                                                                                | 172                                                                                 |
| 11.8                    | 2195                 | 0.9 | 120 | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 150_120                                                                         | P112                                                                                | BN112M4                                                                                 | 152                                                                                 |
| 11.8                    | 2260                 | 1.6 | 120 | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 185_120                                                                         | P112                                                                                | BN112M4                                                                                 | 160                                                                                 |
| 11.8                    | 2260                 | 2.2 | 120 | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_120                                                                         | P112                                                                                | BN112M4                                                                                 | 168                                                                                 |
| 11.8                    | 2292                 | 3.1 | 120 | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_120                                                                         | P112                                                                                | BN112M4                                                                                 | 174                                                                                 |
| 11.9                    | 2123                 | 1.1 | 80  | 19000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_80                                                                           | P132                                                                                | BN132MA6                                                                                | 158                                                                                 |
| 11.9                    | 2091                 | 1.6 | 80  | 33000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_80                                                                           | P132                                                                                | BN132MA6                                                                                | 166                                                                                 |
| 11.9                    | 2155                 | 2.4 | 80  | 50000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_80                                                                           | P132                                                                                | BN132MA6                                                                                | 172                                                                                 |
| 14.2                    | 1749                 | 1.1 | 100 | 18000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_100                                                                          | P112                                                                                | BN112M4                                                                                 | 158                                                                                 |
| 15.8                    | 1719                 | 0.9 | 90  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_90                                                                          | P112                                                                                | BN112M4                                                                                 | 144                                                                                 |
| 15.8                    | 1743                 | 1.1 | 90  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 150_90                                                                          | P112                                                                                | BN112M4                                                                                 | 152                                                                                 |
| 15.8                    | 1840                 | 1.5 | 90  | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 185_90                                                                          | P112                                                                                | BN112M4                                                                                 | 160                                                                                 |
| 15.8                    | 1840                 | 2.2 | 90  | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_90                                                                          | P112                                                                                | BN112M4                                                                                 | 168                                                                                 |
| 15.8                    | 1888                 | 3.2 | 90  | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_90                                                                          | P112                                                                                | BN112M4                                                                                 | 174                                                                                 |
| 15.8                    | 1713                 | 1.5 | 60  | 19000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_60                                                                           | P132                                                                                | BN132MA6                                                                                | 158                                                                                 |
| 15.8                    | 1689                 | 2.2 | 60  | 33000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_60                                                                           | P132                                                                                | BN132MA6                                                                                | 166                                                                                 |
| 15.8                    | 1737                 | 3.2 | 60  | 50000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_60                                                                           | P132                                                                                | BN132MA6                                                                                | 172                                                                                 |
| 17.8                    | 1485                 | 1.4 | 80  | 18000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_80                                                                           | P112                                                                                | BN112M4                                                                                 | 158                                                                                 |
| 20.6                    | 1411                 | 0.9 | 69  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_69                                                                          | P112                                                                                | BN112M4                                                                                 | 144                                                                                 |
| 20.6                    | 1429                 | 1.3 | 69  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 150_69                                                                          | P112                                                                                | BN112M4                                                                                 | 152                                                                                 |
| 20.7                    | 1369                 | 1.3 | 46  | 15500                | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_46                                                                           | P132                                                                                | BN132MA6                                                                                | 150                                                                                 |
| 21.1                    | 1448                 | 3.4 | 45  | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_45                                                                          | P132                                                                                | BN132MA6                                                                                | 168                                                                                 |
| 22.2                    | 1240                 | 1.1 | 64  | 14700                | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_64                                                                           | P112                                                                                | BN112M4                                                                                 | 150                                                                                 |
| 23.7                    | 1259                 | 1.1 | 60  | 13800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 130_60                                                                          | P112                                                                                | BN112M4                                                                                 | 144                                                                                 |
| 23.7                    | 1275                 | 1.5 | 60  | 16000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 150_60                                                                          | P112                                                                                | BN112M4                                                                                 | 152                                                                                 |
| 23.7                    | 1194                 | 1.9 | 60  | 18000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_60                                                                           | P112                                                                                | BN112M4                                                                                 | 158                                                                                 |

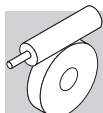


## 4 kW

| n2<br>min-1 | M2<br>Nm | S   | i  | Rn2<br>N |  |  |  |  |  | IEC  |  |     |
|-------------|----------|-----|----|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|
| 23.7        | 1307     | 2.5 | 60 | 19500    | —                                                                                 |                                                                                   |                                                                                   | VFR 185_60                                                                          | P112                                                                                | BN112M4                                                                                 | 160                                                                                 |     |
| 23.7        | 1291     | 3.6 | 60 | 34500    | —                                                                                 |                                                                                   |                                                                                   | VFR 210_60                                                                          | P112                                                                                | BN112M4                                                                                 | 168                                                                                 |     |
| 23.8        | 1174     | 1.0 | 40 | 13200    | —                                                                                 |                                                                                   |                                                                                   | VF 130_40                                                                           | P132                                                                                | BN132MA6                                                                                | 142                                                                                 |     |
| 23.8        | 1206     | 3.6 | 40 | 33000    | —                                                                                 |                                                                                   |                                                                                   | VF 210_40                                                                           | P132                                                                                | BN132MA6                                                                                | 166                                                                                 |     |
| 25.4        | 1100     | 0.9 | 56 | 12500    | —                                                                                 |                                                                                   |                                                                                   | VF 130_56                                                                           | P112                                                                                | BN112M4                                                                                 | 142                                                                                 |     |
| 25.4        | 1115     | 1.2 | 56 | 14700    | —                                                                                 |                                                                                   |                                                                                   | VF 150_56                                                                           | P112                                                                                | BN112M4                                                                                 | 150                                                                                 |     |
| 28.4        | 1022     | 2.4 | 50 | 18000    | —                                                                                 |                                                                                   |                                                                                   | VF 185_50                                                                           | P112                                                                                | BN112M4                                                                                 | 158                                                                                 |     |
| 31          | 940      | 1.1 | 46 | 12600    | —                                                                                 |                                                                                   |                                                                                   | VF 130_46                                                                           | P112                                                                                | BN112M4                                                                                 | 142                                                                                 |     |
| 31          | 953      | 1.6 | 46 | 14700    | —                                                                                 |                                                                                   |                                                                                   | VF 150_46                                                                           | P112                                                                                | BN112M4                                                                                 | 150                                                                                 |     |
| 32          | 993      | 1.7 | 45 | 16000    | —                                                                                 |                                                                                   |                                                                                   | VFR 150_45                                                                          | P112                                                                                | BN112M4                                                                                 | 152                                                                                 |     |
| 32          | 1017     | 2.8 | 45 | 19500    | —                                                                                 |                                                                                   |                                                                                   | VFR 185_45                                                                          | P112                                                                                | BN112M4                                                                                 | 160                                                                                 |     |
| 32          | 929      | 1.3 | 30 | 13200    | —                                                                                 |                                                                                   |                                                                                   | VF 130_30                                                                           | P132                                                                                | BN132MA6                                                                                | 142                                                                                 |     |
| 32          | 977      | 2.5 | 30 | 19000    | —                                                                                 |                                                                                   |                                                                                   | VF 185_30                                                                           | P132                                                                                | BN132MA6                                                                                | 158                                                                                 |     |
| 32          | 965      | 3.5 | 30 | 33000    | —                                                                                 |                                                                                   |                                                                                   | VF 210_30                                                                           | P132                                                                                | BN132MA6                                                                                | 166                                                                                 |     |
| 36          | 818      | 1.3 | 40 | 12600    | —                                                                                 |                                                                                   |                                                                                   | VF 130_40                                                                           | P112                                                                                | BN112M4                                                                                 | 142                                                                                 |     |
| 36          | 829      | 1.9 | 40 | 14700    | —                                                                                 |                                                                                   |                                                                                   | VF 150_40                                                                           | P112                                                                                | BN112M4                                                                                 | 150                                                                                 |     |
| 36          | 769      | 0.9 | 80 | 12600    | —                                                                                 |                                                                                   |                                                                                   | VF 130_80                                                                           | P112                                                                                | BN112M2                                                                                 | 142                                                                                 |     |
| 41          | 749      | 1.4 | 23 | 13200    | —                                                                                 |                                                                                   |                                                                                   | VF 130_23                                                                           | P132                                                                                | BN132MA6                                                                                | 142                                                                                 |     |
| 41          | 758      | 2.0 | 23 | 13200    | —                                                                                 |                                                                                   |                                                                                   | VF 150_23                                                                           | P132                                                                                | BN132MA6                                                                                | 150                                                                                 |     |
| 45          | 641      | 1.1 | 64 | 12600    | —                                                                                 |                                                                                   |                                                                                   | VF 130_64                                                                           | P112                                                                                | BN112M2                                                                                 | 142                                                                                 |     |
| 46          | 635      | 1.1 | 30 | 8000     | W 110_30                                                                          | S3                                                                                | M3LC4                                                                             | 138                                                                                 | W 110_30                                                                            | P112                                                                                    | BN112M4                                                                             | 139 |
| 47          | 638      | 1.6 | 30 | 12600    | —                                                                                 |                                                                                   |                                                                                   | VF 130_30                                                                           | P112                                                                                | BN112M4                                                                                 | 142                                                                                 |     |
| 47          | 646      | 2.1 | 30 | 14700    | —                                                                                 |                                                                                   |                                                                                   | VF 150_30                                                                           | P112                                                                                | BN112M4                                                                                 | 150                                                                                 |     |
| 47          | 686      | 2.2 | 30 | 16000    | —                                                                                 |                                                                                   |                                                                                   | VFR 150_30                                                                          | P112                                                                                | BN112M4                                                                                 | 152                                                                                 |     |
| 60          | 525      | 1.0 | 23 | 8000     | W 110_23                                                                          | S3                                                                                | M3LC4                                                                             | 138                                                                                 | W 110_23                                                                            | P112                                                                                    | BN112M4                                                                             | 139 |
| 62          | 514      | 1.7 | 23 | 12600    | —                                                                                 |                                                                                   |                                                                                   | VF 130_23                                                                           | P112                                                                                | BN112M4                                                                                 | 142                                                                                 |     |
| 62          | 514      | 2.5 | 23 | 14700    | —                                                                                 |                                                                                   |                                                                                   | VF 150_23                                                                           | P112                                                                                | BN112M4                                                                                 | 150                                                                                 |     |
| 63          | 485      | 1.6 | 46 | 12600    | —                                                                                 |                                                                                   |                                                                                   | VF 130_46                                                                           | P112                                                                                | BN112M2                                                                                 | 142                                                                                 |     |
| 70          | 462      | 1.2 | 20 | 8000     | W 110_20                                                                          | S3                                                                                | M3LC4                                                                             | 138                                                                                 | W 110_20                                                                            | P112                                                                                    | BN112M4                                                                             | 139 |
| 71          | 452      | 2.0 | 20 | 12400    | —                                                                                 |                                                                                   |                                                                                   | VF 130_20                                                                           | P112                                                                                | BN112M4                                                                                 | 142                                                                                 |     |
| 93          | 350      | 0.9 | 15 | 5410     | W 86_15                                                                           | S3                                                                                | M3LC4                                                                             | 134                                                                                 | W 86_15                                                                             | P112                                                                                    | BN112M4                                                                             | 135 |
| 93          | 346      | 1.7 | 15 | 8000     | W 110_15                                                                          | S3                                                                                | M3LC4                                                                             | 138                                                                                 | W 110_15                                                                            | P112                                                                                    | BN112M4                                                                             | 139 |
| 95          | 347      | 2.7 | 15 | 11400    | —                                                                                 |                                                                                   |                                                                                   | VF 130_15                                                                           | P112                                                                                | BN112M4                                                                                 | 142                                                                                 |     |
| 95          | 350      | 3.4 | 10 | 12700    | —                                                                                 |                                                                                   |                                                                                   | VF 150_10                                                                           | P132                                                                                | BN132MA6                                                                                | 150                                                                                 |     |
| 139         | 242      | 1.0 | 10 | 2160     | W 75_10                                                                           | S3                                                                                | M3LC4                                                                             | 130                                                                                 | W 75_10                                                                             | P112                                                                                    | BN112M4                                                                             | 131 |
| 139         | 242      | 1.2 | 10 | 4940     | W 86_10                                                                           | S3                                                                                | M3LC4                                                                             | 134                                                                                 | W 86_10                                                                             | P112                                                                                    | BN112M4                                                                             | 135 |
| 139         | 239      | 2.3 | 10 | 7840     | W 110_10                                                                          | S3                                                                                | M3LC4                                                                             | 138                                                                                 | W 110_10                                                                            | P112                                                                                    | BN112M4                                                                             | 139 |
| 142         | 237      | 3.3 | 10 | 10100    | —                                                                                 |                                                                                   |                                                                                   | VF 130_10                                                                           | P112                                                                                | BN112M4                                                                                 | 142                                                                                 |     |
| 191         | 176      | 1.3 | 15 | 2400     | W 75_15                                                                           | S3                                                                                | M3LB2                                                                             | 130                                                                                 | W 75_15                                                                             | P112                                                                                    | BN112M2                                                                             | 131 |
| 191         | 174      | 1.7 | 15 | 4820     | W 86_15                                                                           | S3                                                                                | M3LB2                                                                             | 134                                                                                 | W 86_15                                                                             | P112                                                                                    | BN112M2                                                                             | 135 |
| 191         | 174      | 3.1 | 15 | 7380     | W 110_15                                                                          | S3                                                                                | M3LB2                                                                             | 138                                                                                 | W 110_15                                                                            | P112                                                                                    | BN112M2                                                                             | 139 |
| 199         | 173      | 1.1 | 7  | 1900     | W 75_7                                                                            | S3                                                                                | M3LC4                                                                             | 130                                                                                 | W 75_7                                                                              | P112                                                                                    | BN112M4                                                                             | 131 |
| 199         | 171      | 1.5 | 7  | 4490     | W 86_7                                                                            | S3                                                                                | M3LC4                                                                             | 134                                                                                 | W 86_7                                                                              | P112                                                                                    | BN112M4                                                                             | 135 |
| 199         | 171      | 2.9 | 7  | 7040     | W 110_7                                                                           | S3                                                                                | M3LC4                                                                             | 138                                                                                 | W 110_7                                                                             | P112                                                                                    | BN112M4                                                                             | 139 |
| 287         | 120      | 1.7 | 10 | 2210     | W 75_10                                                                           | S3                                                                                | M3LB2                                                                             | 130                                                                                 | W 75_10                                                                             | P112                                                                                    | BN112M2                                                                             | 131 |
| 287         | 120      | 2.2 | 10 | 4320     | W 86_10                                                                           | S3                                                                                | M3LB2                                                                             | 134                                                                                 | W 86_10                                                                             | P112                                                                                    | BN112M2                                                                             | 135 |
| 410         | 85       | 2.0 | 7  | 2010     | W 75_7                                                                            | S3                                                                                | M3LB2                                                                             | 130                                                                                 | W 75_7                                                                              | P112                                                                                    | BN112M2                                                                             | 131 |
| 410         | 85       | 2.7 | 7  | 3890     | W 86_7                                                                            | S3                                                                                | M3LB2                                                                             | 134                                                                                 | W 86_7                                                                              | P112                                                                                    | BN112M2                                                                             | 135 |

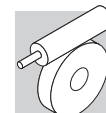
## 5.5 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i   | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|-----|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 2.4                     | 9630                 | 0.9 | 600 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_600                                                                     | P132                                                                                  | BN132S4                                                                                   | 176                                                                                   |
| 3.4                     | 7937                 | 1.2 | 280 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_280                                                                     | P132                                                                                  | BN132MB6                                                                                  | 176                                                                                   |
| 3.6                     | 7295                 | 0.9 | 400 | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_400                                                                     | P132                                                                                  | BN132S4                                                                                   | 170                                                                                   |
| 3.6                     | 7149                 | 1.3 | 400 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_400                                                                     | P132                                                                                  | BN132S4                                                                                   | 176                                                                                   |
| 5.1                     | 5311                 | 1.2 | 280 | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/210_280                                                                     | P132                                                                                  | BN132S4                                                                                   | 170                                                                                   |
| 5.1                     | 5413                 | 1.7 | 280 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VF/VF 130/250_280                                                                     | P132                                                                                  | BN132S4                                                                                   | 176                                                                                   |
| 5.3                     | 6203                 | 1.1 | 180 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VFR 250_180                                                                           | P132                                                                                  | BN132MB6                                                                                  | 174                                                                                   |
| 6.3                     | 5169                 | 1.0 | 150 | 34500                | —                                                                                   | —                                                                                   | —                                                                                   | VFR 210_150                                                                           | P132                                                                                  | BN132MB6                                                                                  | 168                                                                                   |
| 6.3                     | 5253                 | 1.3 | 150 | 52000                | —                                                                                   | —                                                                                   | —                                                                                   | VFR 250_150                                                                           | P132                                                                                  | BN132MB6                                                                                  | 174                                                                                   |



## 5.5 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i    | Rn <sub>2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|------|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 8.0                     | 4202                 | 1.0 | 180  | 34500                | —                                                                                 | —                                                                                 |                                                                                   | VFR 210_180                                                                         | P132                                                                                | BN132S4                                                                                 | 168                                                                                 |
| 8.0                     | 4399                 | 1.4 | 180  | 52000                | —                                                                                 | —                                                                                 |                                                                                   | VFR 250_180                                                                         | P132                                                                                | BN132S4                                                                                 | 174                                                                                 |
| 9.5                     | 3391                 | 0.9 | 100  | 33000                | —                                                                                 | —                                                                                 |                                                                                   | VF 210_100                                                                          | P132                                                                                | BN132MB6                                                                                | 166                                                                                 |
| 9.5                     | 3502                 | 1.4 | 100  | 50000                | —                                                                                 | —                                                                                 |                                                                                   | VF 250_100                                                                          | P132                                                                                | BN132MB6                                                                                | 172                                                                                 |
| 9.6                     | 3666                 | 1.2 | 150  | 34500                | —                                                                                 | —                                                                                 |                                                                                   | VFR 210_150                                                                         | P132                                                                                | BN132S4                                                                                 | 168                                                                                 |
| 9.6                     | 3666                 | 1.8 | 150  | 52000                | —                                                                                 | —                                                                                 |                                                                                   | VFR 250_150                                                                         | P132                                                                                | BN132S4                                                                                 | 174                                                                                 |
| 11.8                    | 2890                 | 1.1 | 80   | 33000                | —                                                                                 | —                                                                                 |                                                                                   | VF 210_80                                                                           | P132                                                                                | BN132MB6                                                                                | 166                                                                                 |
| 11.8                    | 2979                 | 1.7 | 80   | 50000                | —                                                                                 | —                                                                                 |                                                                                   | VF 250_80                                                                           | P132                                                                                | BN132MB6                                                                                | 172                                                                                 |
| 12.0                    | 3064                 | 1.6 | 120  | 34500                | —                                                                                 | —                                                                                 |                                                                                   | VFR 210_120                                                                         | P132                                                                                | BN132S4                                                                                 | 168                                                                                 |
| 12.0                    | 3108                 | 2.3 | 120  | 52000                | —                                                                                 | —                                                                                 |                                                                                   | VFR 250_120                                                                         | P132                                                                                | BN132S4                                                                                 | 174                                                                                 |
| 14.4                    | 2371                 | 1.1 | 100  | 31500                | —                                                                                 | —                                                                                 |                                                                                   | VF 210_100                                                                          | P132                                                                                | BN132S4                                                                                 | 166                                                                                 |
| 14.4                    | 2590                 | 1.4 | 100  | 19500                | —                                                                                 | —                                                                                 |                                                                                   | VFR 185_100                                                                         | P132                                                                                | BN132S4                                                                                 | 160                                                                                 |
| 14.4                    | 2480                 | 1.5 | 100  | 47000                | —                                                                                 | —                                                                                 |                                                                                   | VF 250_100                                                                          | P132                                                                                | BN132S4                                                                                 | 172                                                                                 |
| 15.8                    | 2368                 | 1.1 | 60   | 19000                | —                                                                                 | —                                                                                 |                                                                                   | VF 185_60                                                                           | P132                                                                                | BN132MB6                                                                                | 158                                                                                 |
| 15.8                    | 2334                 | 1.6 | 60   | 33000                | —                                                                                 | —                                                                                 |                                                                                   | VF 210_60                                                                           | P132                                                                                | BN132MB6                                                                                | 166                                                                                 |
| 15.8                    | 2401                 | 2.3 | 60   | 50000                | —                                                                                 | —                                                                                 |                                                                                   | VF 250_60                                                                           | P132                                                                                | BN132MB6                                                                                | 172                                                                                 |
| 16.0                    | 2495                 | 1.6 | 90   | 34500                | —                                                                                 | —                                                                                 |                                                                                   | VFR 210_90                                                                          | P132                                                                                | BN132S4                                                                                 | 168                                                                                 |
| 16.0                    | 2561                 | 2.3 | 90   | 52000                | —                                                                                 | —                                                                                 |                                                                                   | VFR 250_90                                                                          | P132                                                                                | BN132S4                                                                                 | 174                                                                                 |
| 18.0                    | 2013                 | 1.1 | 80   | 18000                | —                                                                                 | —                                                                                 |                                                                                   | VF 185_80                                                                           | P132                                                                                | BN132S4                                                                                 | 158                                                                                 |
| 18.0                    | 2013                 | 1.4 | 80   | 31500                | —                                                                                 | —                                                                                 |                                                                                   | VF 210_80                                                                           | P132                                                                                | BN132S4                                                                                 | 166                                                                                 |
| 18.0                    | 2072                 | 1.9 | 80   | 47000                | —                                                                                 | —                                                                                 |                                                                                   | VF 250_80                                                                           | P132                                                                                | BN132S4                                                                                 | 172                                                                                 |
| 19.2                    | 2106                 | 1.3 | 75   | 19500                | —                                                                                 | —                                                                                 |                                                                                   | VFR 185_75                                                                          | P132                                                                                | BN132S4                                                                                 | 160                                                                                 |
| 20.5                    | 1892                 | 0.9 | 46   | 15500                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_46                                                                           | P132                                                                                | BN132MB6                                                                                | 150                                                                                 |
| 21.0                    | 2001                 | 2.4 | 45   | 34500                | —                                                                                 | —                                                                                 |                                                                                   | VFR 210_45                                                                          | P132                                                                                | BN132MB6                                                                                | 168                                                                                 |
| 21.0                    | 2051                 | 3.3 | 45   | 52000                | —                                                                                 | —                                                                                 |                                                                                   | VFR 250_45                                                                          | P132                                                                                | BN132MB6                                                                                | 174                                                                                 |
| 23.6                    | 1645                 | 1.1 | 40   | 15500                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_40                                                                           | P132                                                                                | BN132MB6                                                                                | 150                                                                                 |
| 24.0                    | 1620                 | 1.4 | 60   | 18000                | —                                                                                 | —                                                                                 |                                                                                   | VF 185_60                                                                           | P132                                                                                | BN132S4                                                                                 | 158                                                                                 |
| 24.0                    | 1598                 | 1.9 | 60   | 31500                | —                                                                                 | —                                                                                 |                                                                                   | VF 210_60                                                                           | P132                                                                                | BN132S4                                                                                 | 166                                                                                 |
| 24.0                    | 1751                 | 2.7 | 60   | 34500                | —                                                                                 | —                                                                                 |                                                                                   | VFR 210_60                                                                          | P132                                                                                | BN132S4                                                                                 | 168                                                                                 |
| 24.0                    | 1663                 | 2.7 | 60   | 47000                | —                                                                                 | —                                                                                 |                                                                                   | VF 250_60                                                                           | P132                                                                                | BN132S4                                                                                 | 172                                                                                 |
| 24.0                    | 1773                 | 4.0 | 60   | 52000                | —                                                                                 | —                                                                                 |                                                                                   | VFR 250_60                                                                          | P132                                                                                | BN132S4                                                                                 | 174                                                                                 |
| 28.8                    | 1430                 | 1.3 | 50   | 15940                | —                                                                                 | —                                                                                 |                                                                                   | VFR 150_50                                                                          | P132                                                                                | BN132S4                                                                                 | 152                                                                                 |
| 28.8                    | 1386                 | 1.8 | 50   | 18000                | —                                                                                 | —                                                                                 |                                                                                   | VF 185_50                                                                           | P132                                                                                | BN132S4                                                                                 | 158                                                                                 |
| 28.8                    | 1477                 | 2.2 | 50   | 19500                | —                                                                                 | —                                                                                 |                                                                                   | VFR 185_50                                                                          | P132                                                                                | BN132S4                                                                                 | 160                                                                                 |
| 28.8                    | 1386                 | 2.4 | 50   | 31500                | —                                                                                 | —                                                                                 |                                                                                   | VF 210_50                                                                           | P132                                                                                | BN132S4                                                                                 | 166                                                                                 |
| 28.8                    | 1386                 | 3.2 | 50   | 47000                | —                                                                                 | —                                                                                 |                                                                                   | VF 250_50                                                                           | P132                                                                                | BN132S4                                                                                 | 172                                                                                 |
| 31                      | 1292                 | 1.2 | 46   | 14700                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_46                                                                           | P132                                                                                | BN132S4                                                                                 | 150                                                                                 |
| 32                      | 1284                 | 1.0 | 30   | 13200                | —                                                                                 | —                                                                                 |                                                                                   | VF 130_30                                                                           | P132                                                                                | BN132MB6                                                                                | 142                                                                                 |
| 32                      | 1362                 | 3.0 | 45   | 34500                | —                                                                                 | —                                                                                 |                                                                                   | VFR 210_45                                                                          | P132                                                                                | BN132S4                                                                                 | 168                                                                                 |
| 36                      | 1109                 | 1.0 | 40   | 12600                | —                                                                                 | —                                                                                 |                                                                                   | VF 130_40                                                                           | P132                                                                                | BN132S4                                                                                 | 142                                                                                 |
| 36                      | 1123                 | 1.4 | 40   | 14700                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_40                                                                           | P132                                                                                | BN132S4                                                                                 | 150                                                                                 |
| 36                      | 1138                 | 2.3 | 40   | 18000                | —                                                                                 | —                                                                                 |                                                                                   | VF 185_40                                                                           | P132                                                                                | BN132S4                                                                                 | 158                                                                                 |
| 36                      | 1138                 | 3.1 | 40   | 31500                | —                                                                                 | —                                                                                 |                                                                                   | VF 210_40                                                                           | P132                                                                                | BN132S4                                                                                 | 166                                                                                 |
| 38                      | 1101                 | 1.5 | 37.5 | 15400                | —                                                                                 | —                                                                                 |                                                                                   | VFR 150_37.5                                                                        | P132                                                                                | BN132S4                                                                                 | 152                                                                                 |
| 38                      | 1149                 | 2.4 | 37.5 | 19500                | —                                                                                 | —                                                                                 |                                                                                   | VFR 185_37.5                                                                        | P132                                                                                | BN132S4                                                                                 | 160                                                                                 |
| 41                      | 1035                 | 1.0 | 23   | 13000                | —                                                                                 | —                                                                                 |                                                                                   | VF 130_23                                                                           | P132                                                                                | BN132MB6                                                                                | 142                                                                                 |
| 41                      | 1048                 | 1.4 | 23   | 15300                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_23                                                                           | P132                                                                                | BN132MB6                                                                                | 150                                                                                 |
| 48                      | 864                  | 1.2 | 30   | 12600                | —                                                                                 | —                                                                                 |                                                                                   | VF 130_30                                                                           | P132                                                                                | BN132S4                                                                                 | 142                                                                                 |
| 48                      | 875                  | 1.6 | 30   | 14700                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_30                                                                           | P132                                                                                | BN132S4                                                                                 | 150                                                                                 |
| 48                      | 908                  | 2.2 | 30   | 18000                | —                                                                                 | —                                                                                 |                                                                                   | VF 185_30                                                                           | P132                                                                                | BN132S4                                                                                 | 158                                                                                 |
| 48                      | 908                  | 3.4 | 30   | 31500                | —                                                                                 | —                                                                                 |                                                                                   | VF 210_30                                                                           | P132                                                                                | BN132S4                                                                                 | 166                                                                                 |
| 58                      | 775                  | 1.9 | 25   | 13400                | —                                                                                 | —                                                                                 |                                                                                   | VFR 150_25                                                                          | P132                                                                                | BN132S4                                                                                 | 152                                                                                 |
| 58                      | 784                  | 3.3 | 25   | 19500                | —                                                                                 | —                                                                                 |                                                                                   | VFR 185_25                                                                          | P132                                                                                | BN132S4                                                                                 | 160                                                                                 |
| 63                      | 696                  | 1.3 | 23   | 12100                | —                                                                                 | —                                                                                 |                                                                                   | VF 130_23                                                                           | P132                                                                                | BN132S4                                                                                 | 142                                                                                 |
| 63                      | 696                  | 1.8 | 23   | 14000                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_23                                                                           | P132                                                                                | BN132S4                                                                                 | 150                                                                                 |
| 63                      | 692                  | 0.9 | 15   | 8000                 | —                                                                                 | —                                                                                 |                                                                                   | W 110_15                                                                            | P132                                                                                | BN132MB6                                                                                | 138                                                                                 |
| 72                      | 613                  | 0.9 | 20   | 8000                 | —                                                                                 | —                                                                                 |                                                                                   | W 110_20                                                                            | P132                                                                                | BN132S4                                                                                 | 138                                                                                 |
| 72                      | 613                  | 1.5 | 20   | 11700                | —                                                                                 | —                                                                                 |                                                                                   | VF 130_20                                                                           | P132                                                                                | BN132S4                                                                                 | 142                                                                                 |
| 72                      | 613                  | 2.1 | 20   | 13500                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_20                                                                           | P132                                                                                | BN132S4                                                                                 | 150                                                                                 |
| 96                      | 460                  | 1.3 | 15   | 8000                 | —                                                                                 | —                                                                                 |                                                                                   | W 110_15                                                                            | P132                                                                                | BN132S4                                                                                 | 138                                                                                 |
| 96                      | 471                  | 2.0 | 15   | 12800                | —                                                                                 | —                                                                                 |                                                                                   | VF 130_15                                                                           | P132                                                                                | BN132S4                                                                                 | 142                                                                                 |
| 96                      | 476                  | 2.4 | 15   | 12400                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_15                                                                           | P132                                                                                | BN132S4                                                                                 | 150                                                                                 |
| 126                     | 359                  | 1.9 | 23   | 10400                | —                                                                                 | —                                                                                 |                                                                                   | VF 130_23                                                                           | P132                                                                                | BN132SA2                                                                                | 142                                                                                 |
| 126                     | 359                  | 2.7 | 23   | 11800                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_23                                                                           | P132                                                                                | BN132SA2                                                                                | 150                                                                                 |
| 144                     | 317                  | 1.7 | 10   | 7330                 | —                                                                                 | —                                                                                 |                                                                                   | W 110_10                                                                            | P132                                                                                | BN132S4                                                                                 | 138                                                                                 |

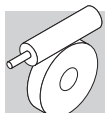


## 5.5 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i  | Rn <sub>2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 144                     | 321                  | 2.5 | 10 | 9680                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 130_10                                                                           | P132                                                                                | BN132S4                                                                                 | 142                                                                                 |
| 144                     | 321                  | 3.3 | 10 | 11000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_10                                                                           | P132                                                                                | BN132S4                                                                                 | 150                                                                                 |
| 193                     | 237                  | 2.3 | 15 | 7060                 | —                                                                                 | —                                                                                 | —                                                                                 | W 110_15                                                                            | P132                                                                                | BN132SA2                                                                                | 138                                                                                 |
| 206                     | 227                  | 2.2 | 7  | 6600                 | —                                                                                 | —                                                                                 | —                                                                                 | W 110_7                                                                             | P132                                                                                | BN132S4                                                                                 | 138                                                                                 |
| 206                     | 227                  | 3.3 | 7  | 8650                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 130_7                                                                            | P132                                                                                | BN132S4                                                                                 | 142                                                                                 |
| 289                     | 162                  | 3.0 | 10 | 6290                 | —                                                                                 | —                                                                                 | —                                                                                 | W 110_10                                                                            | P132                                                                                | BN132SA2                                                                                | 138                                                                                 |
| 289                     | 164                  | 3.6 | 10 | 8110                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 130_10                                                                           | P132                                                                                | BN132SA2                                                                                | 142                                                                                 |
| 413                     | 115                  | 3.9 | 7  | 5640                 | —                                                                                 | —                                                                                 | —                                                                                 | W 110_7                                                                             | P132                                                                                | BN132SA2                                                                                | 138                                                                                 |
| 413                     | 116                  | 4.8 | 7  | 7230                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 130_7                                                                            | P132                                                                                | BN132SA2                                                                                | 142                                                                                 |

## 7.5 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i    | Rn <sub>2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|------|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 3.6                     | 9749                 | 0.9 | 400  | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 130/250_400                                                                   | P132                                                                                | BN132MA4                                                                                | 176                                                                                 |
| 5.1                     | 7242                 | 0.9 | 280  | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 130/210_280                                                                   | P132                                                                                | BN132MA4                                                                                | 170                                                                                 |
| 5.1                     | 7381                 | 1.2 | 280  | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VF/VF 130/250_280                                                                   | P132                                                                                | BN132MA4                                                                                | 176                                                                                 |
| 6.4                     | 7088                 | 1.0 | 150  | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_150                                                                         | P160                                                                                | BN160M6                                                                                 | 174                                                                                 |
| 8.0                     | 5940                 | 1.0 | 120  | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_120                                                                         | P160                                                                                | BN160M6                                                                                 | 168                                                                                 |
| 8.0                     | 5999                 | 1.1 | 180  | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_180                                                                         | P132                                                                                | BN132MA4                                                                                | 174                                                                                 |
| 9.6                     | 4725                 | 1.0 | 100  | 50000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_100                                                                          | P160                                                                                | BN160M6                                                                                 | 172                                                                                 |
| 9.6                     | 4999                 | 1.3 | 150  | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_150                                                                         | P132                                                                                | BN132MA4                                                                                | 174                                                                                 |
| 10.6                    | 4860                 | 0.9 | 90   | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_90                                                                          | P160                                                                                | BN160M6                                                                                 | 168                                                                                 |
| 11.9                    | 4020                 | 1.3 | 80   | 50000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_80                                                                           | P160                                                                                | BN160M6                                                                                 | 172                                                                                 |
| 12.0                    | 4178                 | 1.2 | 120  | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_120                                                                         | P132                                                                                | BN132MA4                                                                                | 168                                                                                 |
| 12.0                    | 4238                 | 1.7 | 120  | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_120                                                                         | P132                                                                                | BN132MA4                                                                                | 174                                                                                 |
| 14.4                    | 3532                 | 1.0 | 100  | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 185_100                                                                         | P132                                                                                | BN132MA4                                                                                | 160                                                                                 |
| 14.4                    | 3382                 | 1.1 | 100  | 47000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_100                                                                          | P132                                                                                | BN132MA4                                                                                | 172                                                                                 |
| 15.9                    | 3150                 | 1.2 | 60   | 33000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_60                                                                           | P160                                                                                | BN160M6                                                                                 | 166                                                                                 |
| 16.0                    | 3402                 | 1.2 | 90   | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_90                                                                          | P132                                                                                | BN132MA4                                                                                | 168                                                                                 |
| 16.0                    | 3492                 | 1.7 | 90   | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_90                                                                          | P132                                                                                | BN132MA4                                                                                | 174                                                                                 |
| 18.0                    | 2746                 | 1.1 | 80   | 31500                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_80                                                                           | P132                                                                                | BN132MA4                                                                                | 166                                                                                 |
| 18.0                    | 2825                 | 1.4 | 80   | 47000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_80                                                                           | P132                                                                                | BN132MA4                                                                                | 172                                                                                 |
| 19.2                    | 2872                 | 1.0 | 75   | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 185_75                                                                          | P132                                                                                | BN132MA4                                                                                | 160                                                                                 |
| 21.2                    | 2700                 | 1.8 | 45   | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_45                                                                          | P160                                                                                | BN160M6                                                                                 | 168                                                                                 |
| 21.2                    | 2768                 | 2.5 | 45   | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_45                                                                          | P160                                                                                | BN160M6                                                                                 | 174                                                                                 |
| 24.0                    | 2208                 | 1.0 | 60   | 18000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_60                                                                           | P132                                                                                | BN132MA4                                                                                | 158                                                                                 |
| 24.0                    | 2179                 | 1.4 | 60   | 31500                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_60                                                                           | P132                                                                                | BN132MA4                                                                                | 166                                                                                 |
| 24.0                    | 2388                 | 2.0 | 60   | 31500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_60                                                                          | P132                                                                                | BN132MA4                                                                                | 168                                                                                 |
| 24.0                    | 2268                 | 2.0 | 60   | 47000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_60                                                                           | P132                                                                                | BN132MA4                                                                                | 172                                                                                 |
| 24.0                    | 2417                 | 2.9 | 60   | 52000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_60                                                                          | P132                                                                                | BN132MA4                                                                                | 174                                                                                 |
| 28.8                    | 1950                 | 1.0 | 50   | 14100                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 150_50                                                                          | P132                                                                                | BN132MA4                                                                                | 152                                                                                 |
| 28.8                    | 1890                 | 1.3 | 50   | 18000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_50                                                                           | P132                                                                                | BN132MA4                                                                                | 158                                                                                 |
| 28.8                    | 2014                 | 1.6 | 50   | 19500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 185_50                                                                          | P132                                                                                | BN132MA4                                                                                | 160                                                                                 |
| 28.8                    | 1890                 | 1.7 | 50   | 31500                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_50                                                                           | P132                                                                                | BN132MA4                                                                                | 166                                                                                 |
| 28.8                    | 1890                 | 2.4 | 50   | 47000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_50                                                                           | P132                                                                                | BN132MA4                                                                                | 172                                                                                 |
| 31                      | 1762                 | 0.9 | 46   | 14700                | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_46                                                                           | P132                                                                                | BN132MA4                                                                                | 150                                                                                 |
| 32                      | 1858                 | 2.2 | 45   | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_45                                                                          | P132                                                                                | BN132MA4                                                                                | 168                                                                                 |
| 32                      | 1880                 | 3.4 | 45   | 48800                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_45                                                                          | P132                                                                                | BN132MA4                                                                                | 174                                                                                 |
| 36                      | 1532                 | 1.0 | 40   | 14700                | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_40                                                                           | P132                                                                                | BN132MA4                                                                                | 150                                                                                 |
| 36                      | 1552                 | 1.7 | 40   | 18000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_40                                                                           | P132                                                                                | BN132MA4                                                                                | 158                                                                                 |
| 36                      | 1552                 | 2.3 | 40   | 31500                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_40                                                                           | P132                                                                                | BN132MA4                                                                                | 166                                                                                 |
| 36                      | 1572                 | 3.1 | 40   | 47000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_40                                                                           | P132                                                                                | BN132MA4                                                                                | 172                                                                                 |
| 38                      | 1501                 | 1.1 | 37.5 | 13200                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 150_37.5                                                                        | P132                                                                                | BN132MA4                                                                                | 152                                                                                 |
| 38                      | 1567                 | 1.8 | 37.5 | 18300                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 185_37.5                                                                        | P132                                                                                | BN132MA4                                                                                | 160                                                                                 |
| 48                      | 1179                 | 0.9 | 30   | 11900                | —                                                                                 | —                                                                                 | —                                                                                 | VF 130_30                                                                           | P132                                                                                | BN132MA4                                                                                | 142                                                                                 |
| 48                      | 1194                 | 1.1 | 30   | 14200                | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_30                                                                           | P132                                                                                | BN132MA4                                                                                | 150                                                                                 |
| 48                      | 1239                 | 1.6 | 30   | 18000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_30                                                                           | P132                                                                                | BN132MA4                                                                                | 158                                                                                 |
| 48                      | 1239                 | 2.5 | 30   | 31500                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_30                                                                           | P132                                                                                | BN132MA4                                                                                | 166                                                                                 |
| 48                      | 1283                 | 3.0 | 30   | 33400                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_30                                                                          | P132                                                                                | BN132MA4                                                                                | 168                                                                                 |
| 48                      | 1253                 | 3.2 | 30   | 4440                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_30                                                                           | P132                                                                                | BN132MA4                                                                                | 172                                                                                 |
| 58                      | 1057                 | 1.4 | 25   | 11000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 150_25                                                                          | P132                                                                                | BN132MA4                                                                                | 152                                                                                 |

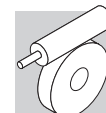


## 7.5 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i  | Rn <sub>2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 58                      | 1069                 | 2.4 | 25 | 16700                | —                                                                                 | —                                                                                 |                                                                                   | VFR 185_25                                                                          | P132                                                                                | BN132MA4                                                                                | 160                                                                                 |
| 63                      | 950                  | 0.9 | 23 | 11200                | —                                                                                 | —                                                                                 |                                                                                   | VF 130_23                                                                           | P132                                                                                | BN132MA4                                                                                | 142                                                                                 |
| 63                      | 950                  | 1.3 | 23 | 13200                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_23                                                                           | P132                                                                                | BN132MA4                                                                                | 150                                                                                 |
| 64                      | 968                  | 2.3 | 15 | 16700                | —                                                                                 | —                                                                                 |                                                                                   | VF 185_15                                                                           | P160                                                                                | BN160M6                                                                                 | 158                                                                                 |
| 64                      | 968                  | 3.4 | 15 | 31500                | —                                                                                 | —                                                                                 |                                                                                   | VF 210_15                                                                           | P160                                                                                | BN160M6                                                                                 | 166                                                                                 |
| 72                      | 836                  | 1.1 | 20 | 10800                | —                                                                                 | —                                                                                 |                                                                                   | VF 130_20                                                                           | P132                                                                                | BN132MA4                                                                                | 142                                                                                 |
| 72                      | 836                  | 1.6 | 20 | 12700                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_20                                                                           | P132                                                                                | BN132MA4                                                                                | 150                                                                                 |
| 96                      | 627                  | 1.0 | 15 | 7370                 | —                                                                                 | —                                                                                 |                                                                                   | W 110_15                                                                            | P132                                                                                | BN132MA4                                                                                | 138                                                                                 |
| 96                      | 642                  | 1.4 | 15 | 10200                | —                                                                                 | —                                                                                 |                                                                                   | VF 130_15                                                                           | P132                                                                                | BN132MA4                                                                                | 142                                                                                 |
| 96                      | 649                  | 1.8 | 15 | 11700                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_15                                                                           | P132                                                                                | BN132MA4                                                                                | 150                                                                                 |
| 126                     | 489                  | 1.4 | 23 | 9900                 | —                                                                                 | —                                                                                 |                                                                                   | VF 130_23                                                                           | P132                                                                                | BN132SB2                                                                                | 142                                                                                 |
| 126                     | 489                  | 2.0 | 23 | 11400                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_23                                                                           | P132                                                                                | BN132SB2                                                                                | 150                                                                                 |
| 136                     | 467                  | 2.5 | 7  | 10200                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_7                                                                            | P160                                                                                | BN160M6                                                                                 | 150                                                                                 |
| 144                     | 433                  | 1.3 | 10 | 6720                 | —                                                                                 | —                                                                                 |                                                                                   | W 110_10                                                                            | P132                                                                                | BN132MA4                                                                                | 138                                                                                 |
| 144                     | 438                  | 1.8 | 10 | 9150                 | —                                                                                 | —                                                                                 |                                                                                   | VF 130_10                                                                           | P132                                                                                | BN132MA4                                                                                | 142                                                                                 |
| 144                     | 438                  | 2.4 | 10 | 10500                | —                                                                                 | —                                                                                 |                                                                                   | VF 150_10                                                                           | P132                                                                                | BN132MA4                                                                                | 150                                                                                 |
| 193                     | 322                  | 1.7 | 15 | 6660                 | —                                                                                 | —                                                                                 |                                                                                   | W 110_15                                                                            | P132                                                                                | BN132SB2                                                                                | 138                                                                                 |
| 206                     | 310                  | 1.6 | 7  | 6100                 | —                                                                                 | —                                                                                 |                                                                                   | W 110_7                                                                             | P132                                                                                | BN132MA4                                                                                | 138                                                                                 |
| 206                     | 310                  | 2.4 | 7  | 8210                 | —                                                                                 | —                                                                                 |                                                                                   | VF 130_7                                                                            | P132                                                                                | BN132MA4                                                                                | 142                                                                                 |
| 206                     | 313                  | 3.2 | 7  | 9400                 | —                                                                                 | —                                                                                 |                                                                                   | VF 150_7                                                                            | P132                                                                                | BN132MA4                                                                                | 150                                                                                 |
| 290                     | 220                  | 2.2 | 10 | 5980                 | —                                                                                 | —                                                                                 |                                                                                   | W 110_10                                                                            | P132                                                                                | BN132SB2                                                                                | 138                                                                                 |
| 290                     | 222                  | 2.7 | 10 | 7840                 | —                                                                                 | —                                                                                 |                                                                                   | VF 130_10                                                                           | P132                                                                                | BN132SB2                                                                                | 142                                                                                 |
| 414                     | 156                  | 2.9 | 7  | 5380                 | —                                                                                 | —                                                                                 |                                                                                   | W 110_7                                                                             | P132                                                                                | BN132SB2                                                                                | 138                                                                                 |
| 414                     | 157                  | 3.5 | 7  | 7010                 | —                                                                                 | —                                                                                 |                                                                                   | VF 130_7                                                                            | P132                                                                                | BN132SB2                                                                                | 142                                                                                 |

## 9.2 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i    | Rn <sub>2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|------|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 5.1                     | 9054                 | 1.0 | 280  | 52000                | —                                                                                   | —                                                                                   |                                                                                     | VF/VF 130/250_280                                                                     | P132                                                                                  | BN132MB4                                                                                  | 176                                                                                   |
| 9.6                     | 6132                 | 1.1 | 150  | 52000                | —                                                                                   | —                                                                                   |                                                                                     | VFR 250_150                                                                           | P132                                                                                  | BN132MB4                                                                                  | 174                                                                                   |
| 12.0                    | 5198                 | 1.3 | 120  | 52000                | —                                                                                   | —                                                                                   |                                                                                     | VFR 250_120                                                                           | P132                                                                                  | BN132MB4                                                                                  | 174                                                                                   |
| 14.4                    | 4149                 | 0.9 | 100  | 47000                | —                                                                                   | —                                                                                   |                                                                                     | VF 250_100                                                                            | P132                                                                                  | BN132MB4                                                                                  | 172                                                                                   |
| 16.0                    | 4173                 | 1.0 | 90   | 34500                | —                                                                                   | —                                                                                   |                                                                                     | VFR 210_90                                                                            | P132                                                                                  | BN132MB4                                                                                  | 168                                                                                   |
| 16.0                    | 4283                 | 1.4 | 90   | 52000                | —                                                                                   | —                                                                                   |                                                                                     | VFR 250_90                                                                            | P132                                                                                  | BN132MB4                                                                                  | 174                                                                                   |
| 18.0                    | 3368                 | 0.9 | 80   | 31500                | —                                                                                   | —                                                                                   |                                                                                     | VF 210_80                                                                             | P132                                                                                  | BN132MB4                                                                                  | 166                                                                                   |
| 18.0                    | 3466                 | 1.1 | 80   | 47000                | —                                                                                   | —                                                                                   |                                                                                     | VF 250_80                                                                             | P132                                                                                  | BN132MB4                                                                                  | 172                                                                                   |
| 24.0                    | 2672                 | 1.1 | 60   | 31500                | —                                                                                   | —                                                                                   |                                                                                     | VF 210_60                                                                             | P132                                                                                  | BN132MB4                                                                                  | 166                                                                                   |
| 24.0                    | 2929                 | 1.6 | 60   | 34500                | —                                                                                   | —                                                                                   |                                                                                     | VFR 210_60                                                                            | P132                                                                                  | BN132MB4                                                                                  | 168                                                                                   |
| 24.0                    | 2782                 | 1.6 | 60   | 47000                | —                                                                                   | —                                                                                   |                                                                                     | VF 250_60                                                                             | P132                                                                                  | BN132MB4                                                                                  | 172                                                                                   |
| 24.0                    | 2965                 | 2.4 | 60   | 51900                | —                                                                                   | —                                                                                   |                                                                                     | VFR 250_60                                                                            | P132                                                                                  | BN132MB4                                                                                  | 174                                                                                   |
| 28.8                    | 2319                 | 1.1 | 50   | 18000                | —                                                                                   | —                                                                                   |                                                                                     | VF 185_50                                                                             | P132                                                                                  | BN132MB4                                                                                  | 158                                                                                   |
| 28.8                    | 2471                 | 1.3 | 50   | 18600                | —                                                                                   | —                                                                                   |                                                                                     | VFR 185_50                                                                            | P132                                                                                  | BN132MB4                                                                                  | 160                                                                                   |
| 28.8                    | 2319                 | 1.4 | 50   | 31500                | —                                                                                   | —                                                                                   |                                                                                     | VF 210_50                                                                             | P132                                                                                  | BN132MB4                                                                                  | 166                                                                                   |
| 28.8                    | 2319                 | 1.9 | 50   | 47000                | —                                                                                   | —                                                                                   |                                                                                     | VF 250_50                                                                             | P132                                                                                  | BN132MB4                                                                                  | 172                                                                                   |
| 32                      | 2279                 | 1.8 | 45   | 34500                | —                                                                                   | —                                                                                   |                                                                                     | VFR 210_45                                                                            | P132                                                                                  | BN132MB4                                                                                  | 168                                                                                   |
| 32                      | 2306                 | 2.8 | 45   | 48000                | —                                                                                   | —                                                                                   |                                                                                     | VFR 250_45                                                                            | P132                                                                                  | BN132MB4                                                                                  | 174                                                                                   |
| 36                      | 1904                 | 1.4 | 40   | 18000                | —                                                                                   | —                                                                                   |                                                                                     | VF 185_40                                                                             | P132                                                                                  | BN132MB4                                                                                  | 158                                                                                   |
| 36                      | 1904                 | 1.8 | 40   | 31500                | —                                                                                   | —                                                                                   |                                                                                     | VF 210_40                                                                             | P132                                                                                  | BN132MB4                                                                                  | 166                                                                                   |
| 36                      | 1928                 | 2.5 | 40   | 47000                | —                                                                                   | —                                                                                   |                                                                                     | VF 250_40                                                                             | P132                                                                                  | BN132MB4                                                                                  | 172                                                                                   |
| 38                      | 1884                 | 0.9 | 37.5 | 11900                | —                                                                                   | —                                                                                   |                                                                                     | VFR 150_37.5                                                                          | P132                                                                                  | BN132MB4                                                                                  | 152                                                                                   |
| 38                      | 1922                 | 1.5 | 37.5 | 17200                | —                                                                                   | —                                                                                   |                                                                                     | VFR 185_37.5                                                                          | P132                                                                                  | BN132MB4                                                                                  | 160                                                                                   |
| 48                      | 1464                 | 0.9 | 30   | 11300                | —                                                                                   | —                                                                                   |                                                                                     | VF 150_30                                                                             | P132                                                                                  | BN132MB4                                                                                  | 150                                                                                   |
| 48                      | 1519                 | 1.3 | 30   | 17900                | —                                                                                   | —                                                                                   |                                                                                     | VF 185_30                                                                             | P132                                                                                  | BN132MB4                                                                                  | 158                                                                                   |
| 48                      | 1519                 | 2.0 | 30   | 31500                | —                                                                                   | —                                                                                   |                                                                                     | VF 210_30                                                                             | P132                                                                                  | BN132MB4                                                                                  | 166                                                                                   |
| 48                      | 1574                 | 2.4 | 30   | 32600                | —                                                                                   | —                                                                                   |                                                                                     | VFR 210_30                                                                            | P132                                                                                  | BN132MB4                                                                                  | 168                                                                                   |
| 48                      | 1538                 | 2.6 | 30   | 43900                | —                                                                                   | —                                                                                   |                                                                                     | VF 250_30                                                                             | P132                                                                                  | BN132MB4                                                                                  | 172                                                                                   |
| 48                      | 1574                 | 3.8 | 30   | 42800                | —                                                                                   | —                                                                                   |                                                                                     | VFR 250_30                                                                            | P132                                                                                  | BN132MB4                                                                                  | 174                                                                                   |
| 58                      | 1297                 | 1.2 | 25   | 11200                | —                                                                                   | —                                                                                   |                                                                                     | VFR 150_25                                                                            | P132                                                                                  | BN132MB4                                                                                  | 152                                                                                   |
| 58                      | 1312                 | 2.0 | 25   | 15800                | —                                                                                   | —                                                                                   |                                                                                     | VFR 185_25                                                                            | P132                                                                                  | BN132MB4                                                                                  | 160                                                                                   |
| 63                      | 1165                 | 1.1 | 23   | 12500                | —                                                                                   | —                                                                                   |                                                                                     | VF 150_23                                                                             | P132                                                                                  | BN132MB4                                                                                  | 150                                                                                   |
| 72                      | 1025                 | 0.9 | 20   | 10100                | —                                                                                   | —                                                                                   |                                                                                     | VF 130_20                                                                             | P132                                                                                  | BN132MB4                                                                                  | 142                                                                                   |

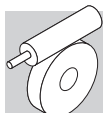


## 9.2 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |   |  |  |           | IEC           |     |
|-------------------------|----------------------|-----|----|----------------------|---|--|--|-----------|---------------|-----|
| 72                      | 1025                 | 1.3 | 20 | 12100                | — |  |  | VF 150_20 | P132 BN132MB4 | 150 |
| 72                      | 1037                 | 3.0 | 20 | 30400                | — |  |  | VF 210_20 | P132 BN132MB4 | 166 |
| 96                      | 787                  | 1.2 | 15 | 9560                 | — |  |  | VF 130_15 | P132 BN132MB4 | 142 |
| 96                      | 796                  | 1.4 | 15 | 11200                | — |  |  | VF 150_15 | P132 BN132MB4 | 150 |
| 126                     | 599                  | 1.1 | 23 | 9510                 | — |  |  | VF 130_23 | P132 BN132M2  | 142 |
| 126                     | 599                  | 1.6 | 23 | 11000                | — |  |  | VF 150_23 | P132 BN132M2  | 150 |
| 144                     | 531                  | 1.0 | 10 | 6210                 | — |  |  | W 110_10  | P132 BN132MB4 | 138 |
| 144                     | 537                  | 1.5 | 10 | 8690                 | — |  |  | VF 130_10 | P132 BN132MB4 | 142 |
| 144                     | 537                  | 2.0 | 10 | 16100                | — |  |  | VF 150_10 | P132 BN132MB4 | 150 |
| 193                     | 395                  | 1.4 | 15 | 6320                 | — |  |  | W 110_15  | P132 BN132M2  | 138 |
| 206                     | 380                  | 1.3 | 7  | 5670                 | — |  |  | W 110_7   | P132 BN132MB4 | 138 |
| 206                     | 380                  | 1.9 | 7  | 7820                 | — |  |  | VF 130_7  | P132 BN132MB4 | 142 |
| 206                     | 384                  | 2.6 | 7  | 9030                 | — |  |  | VF 150_7  | P132 BN132MB4 | 150 |
| 290                     | 270                  | 1.8 | 10 | 5720                 | — |  |  | W 110_10  | P132 BN132M2  | 138 |
| 290                     | 273                  | 2.2 | 10 | 7620                 | — |  |  | VF 130_10 | P132 BN132M2  | 142 |
| 290                     | 273                  | 2.9 | 10 | 8690                 | — |  |  | VF 150_10 | P132 BN132M2  | 150 |
| 414                     | 191                  | 2.3 | 7  | 5170                 | — |  |  | W 110_7   | P132 BN132M2  | 138 |
| 414                     | 193                  | 2.9 | 7  | 6820                 | — |  |  | VF 130_7  | P132 BN132M2  | 142 |

## 11 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i   | R <sub>n2</sub><br>N |   |  |  |             | IEC           |     |
|-------------------------|----------------------|-----|-----|----------------------|---|--|--|-------------|---------------|-----|
| 8.0                     | 8798                 | 0.9 | 120 | 52000                | — |  |  | VFR 250_120 | P160 BN160L6  | 174 |
| 10.7                    | 7288                 | 0.9 | 90  | 52000                | — |  |  | VFR 250_90  | P160 BN160L6  | 174 |
| 12.0                    | 5865                 | 0.9 | 80  | 50000                | — |  |  | VF 250_80   | P160 BN160L6  | 172 |
| 12.0                    | 6215                 | 1.1 | 120 | 52000                | — |  |  | VFR 250_120 | P160 BN160MR4 | 174 |
| 16.0                    | 5056                 | 1.1 | 60  | 34500                | — |  |  | VFR 210_60  | P160 BN160L6  | 168 |
| 16.0                    | 5121                 | 1.2 | 90  | 52000                | — |  |  | VFR 250_90  | P160 BN160MR4 | 174 |
| 16.0                    | 4727                 | 1.2 | 60  | 50000                | — |  |  | VF 250_60   | P160 BN160L6  | 172 |
| 18.0                    | 4144                 | 0.9 | 80  | 47000                | — |  |  | VF 250_80   | P160 BN160MR4 | 172 |
| 19.2                    | 3939                 | 1.0 | 50  | 33000                | — |  |  | VF 210_50   | P160 BN160L6  | 166 |
| 21.3                    | 3939                 | 1.2 | 45  | 34500                | — |  |  | VFR 210_45  | P160 BN160L6  | 168 |
| 21.3                    | 4038                 | 1.7 | 45  | 51300                | — |  |  | VFR 250_45  | P160 BN160L6  | 174 |
| 24.0                    | 3327                 | 0.9 | 40  | 18000                | — |  |  | VF 185_40   | P160 BN160L6  | 158 |
| 24.0                    | 3195                 | 0.9 | 60  | 31500                | — |  |  | VF 210_60   | P160 BN160MR4 | 166 |
| 24.0                    | 3283                 | 1.3 | 40  | 33000                | — |  |  | VF 210_40   | P160 BN160L6  | 166 |
| 24.0                    | 3502                 | 1.3 | 60  | 34500                | — |  |  | VFR 210_60  | P160 BN160MR4 | 168 |
| 24.0                    | 3327                 | 1.4 | 60  | 47000                | — |  |  | VF 250_60   | P160 BN160MR4 | 172 |
| 24.0                    | 3327                 | 2.0 | 40  | 50000                | — |  |  | VF 250_40   | P160 BN160L6  | 172 |
| 24.0                    | 3545                 | 2.0 | 60  | 50900                | — |  |  | VFR 250_60  | P160 BN160MR4 | 174 |
| 28.8                    | 2772                 | 1.2 | 50  | 31500                | — |  |  | VF 210_50   | P160 BN160MR4 | 166 |
| 28.8                    | 2772                 | 1.6 | 50  | 47000                | — |  |  | VF 250_50   | P160 BN160MR4 | 172 |
| 32                      | 2659                 | 0.9 | 30  | 18100                | — |  |  | VF 185_30   | P160 BN160L6  | 158 |
| 32                      | 2725                 | 1.5 | 45  | 34500                | — |  |  | VFR 210_45  | P160 BN160MR4 | 168 |
| 32                      | 2758                 | 2.3 | 45  | 47100                | — |  |  | VFR 250_45  | P160 BN160MR4 | 174 |
| 36                      | 2276                 | 1.2 | 40  | 18500                | — |  |  | VF 185_40   | P160 BN160MR4 | 158 |
| 36                      | 2276                 | 1.5 | 40  | 31500                | — |  |  | VF 210_40   | P160 BN160MR4 | 166 |
| 36                      | 2305                 | 2.1 | 40  | 47000                | — |  |  | VF 250_40   | P160 BN160MR4 | 172 |
| 48                      | 1816                 | 1.1 | 30  | 17200                | — |  |  | VF 185_30   | P160 BN160MR4 | 158 |
| 48                      | 1816                 | 1.7 | 30  | 31500                | — |  |  | VF 210_30   | P160 BN160MR4 | 166 |
| 48                      | 1882                 | 2.0 | 30  | 31800                | — |  |  | VFR 210_30  | P160 BN160MR4 | 168 |
| 48                      | 1838                 | 2.2 | 30  | 43400                | — |  |  | VF 250_30   | P160 BN160MR4 | 172 |
| 48                      | 1882                 | 3.2 | 30  | 42100                | — |  |  | VFR 250_30  | P160 BN160MR4 | 174 |
| 48                      | 1860                 | 3.2 | 20  | 43100                | — |  |  | VF 250_20   | P160 BN160L6  | 172 |
| 64                      | 1395                 | 1.0 | 15  | 10900                | — |  |  | VF 150_15   | P160 BN160L6  | 150 |
| 64                      | 1412                 | 1.6 | 15  | 15300                | — |  |  | VF 185_15   | P160 BN160L6  | 158 |
| 64                      | 1412                 | 2.3 | 15  | 30500                | — |  |  | VF 210_15   | P160 BN160L6  | 166 |
| 72                      | 1226                 | 1.1 | 20  | 11400                | — |  |  | VF 150_20   | P160 BN160MR4 | 150 |
| 72                      | 1240                 | 1.8 | 20  | 15600                | — |  |  | VF 185_20   | P160 BN160MR4 | 158 |
| 72                      | 1240                 | 2.5 | 20  | 30000                | — |  |  | VF 210_20   | P160 BN160MR4 | 166 |
| 96                      | 952                  | 1.2 | 15  | 10600                | — |  |  | VF 150_15   | P160 BN160MR4 | 150 |



## 11 kW

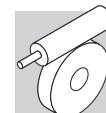
| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 96                      | 963                  | 1.9 | 15 | 14200                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_15                                                                           | P160                                                                                | BN160MR4                                                                                | 158                                                                                 |
| 96                      | 963                  | 3.0 | 15 | 27700                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_15                                                                           | P160                                                                                | BN160MR4                                                                                | 166                                                                                 |
| 144                     | 642                  | 1.6 | 10 | 9670                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_10                                                                           | P160                                                                                | BN160MR4                                                                                | 150                                                                                 |
| 146                     | 635                  | 2.7 | 20 | 13300                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_20                                                                           | P160                                                                                | BN160MR2                                                                                | 158                                                                                 |
| 194                     | 482                  | 2.9 | 15 | 12200                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_15                                                                           | P160                                                                                | BN160MR2                                                                                | 158                                                                                 |
| 206                     | 460                  | 2.2 | 7  | 8660                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_7                                                                            | P160                                                                                | BN160MR4                                                                                | 150                                                                                 |
| 291                     | 325                  | 2.4 | 10 | 8440                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_10                                                                           | P160                                                                                | BN160MR2                                                                                | 150                                                                                 |
| 416                     | 230                  | 3.3 | 7  | 7530                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_7                                                                            | P160                                                                                | BN160MR2                                                                                | 150                                                                                 |

## 15 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 16.2                    | 6380                 | 0.9 | 60 | 50000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_60                                                                           | P180                                                                                | BN180L6                                                                                 | 172                                                                                 |
| 19.4                    | 5390                 | 1.2 | 50 | 50000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_50                                                                           | P180                                                                                | BN180L6                                                                                 | 172                                                                                 |
| 24.3                    | 4430                 | 1.0 | 40 | 33000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_40                                                                           | P180                                                                                | BN180L6                                                                                 | 166                                                                                 |
| 24.3                    | 4489                 | 1.4 | 40 | 50000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_40                                                                           | P180                                                                                | BN180L6                                                                                 | 172                                                                                 |
| 24.3                    | 4474                 | 1.0 | 60 | 47000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_60                                                                           | P160                                                                                | BN160L4                                                                                 | 172                                                                                 |
| 24.3                    | 4768                 | 1.5 | 60 | 48700                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_60                                                                          | P160                                                                                | BN160L4                                                                                 | 174                                                                                 |
| 29.2                    | 3728                 | 0.9 | 50 | 31500                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_50                                                                           | P160                                                                                | BN160L4                                                                                 | 166                                                                                 |
| 29.2                    | 3728                 | 1.2 | 50 | 47000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_50                                                                           | P160                                                                                | BN160L4                                                                                 | 172                                                                                 |
| 32                      | 3665                 | 1.1 | 45 | 33200                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_45                                                                          | P160                                                                                | BN160L4                                                                                 | 168                                                                                 |
| 32                      | 3709                 | 1.7 | 45 | 45200                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_45                                                                          | P160                                                                                | BN160L4                                                                                 | 174                                                                                 |
| 37                      | 3061                 | 0.9 | 40 | 16600                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_40                                                                           | P160                                                                                | BN160L4                                                                                 | 158                                                                                 |
| 37                      | 3061                 | 1.1 | 40 | 31500                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_40                                                                           | P160                                                                                | BN160L4                                                                                 | 166                                                                                 |
| 37                      | 3100                 | 1.5 | 40 | 45900                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_40                                                                           | P160                                                                                | BN160L4                                                                                 | 172                                                                                 |
| 49                      | 2481                 | 1.1 | 20 | 14800                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_20                                                                           | P180                                                                                | BN180L6                                                                                 | 158                                                                                 |
| 49                      | 2443                 | 1.2 | 30 | 31500                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_30                                                                           | P160                                                                                | BN160L4                                                                                 | 166                                                                                 |
| 49                      | 2531                 | 1.5 | 30 | 30000                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 210_30                                                                          | P160                                                                                | BN160L4                                                                                 | 168                                                                                 |
| 49                      | 2473                 | 1.6 | 30 | 42400                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_30                                                                           | P160                                                                                | BN160L4                                                                                 | 172                                                                                 |
| 49                      | 2531                 | 2.4 | 30 | 40600                | —                                                                                 | —                                                                                 | —                                                                                 | VFR 250_30                                                                          | P160                                                                                | BN160L4                                                                                 | 174                                                                                 |
| 65                      | 1905                 | 1.2 | 15 | 13600                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_15                                                                           | P180                                                                                | BN180L6                                                                                 | 158                                                                                 |
| 65                      | 1905                 | 1.7 | 15 | 29300                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_15                                                                           | P180                                                                                | BN180L6                                                                                 | 166                                                                                 |
| 65                      | 1927                 | 2.8 | 15 | 38700                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_15                                                                           | P180                                                                                | BN180L6                                                                                 | 172                                                                                 |
| 73                      | 1668                 | 1.4 | 20 | 14300                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_20                                                                           | P160                                                                                | BN160L4                                                                                 | 158                                                                                 |
| 73                      | 1668                 | 1.9 | 20 | 29100                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_20                                                                           | P160                                                                                | BN160L4                                                                                 | 166                                                                                 |
| 73                      | 1688                 | 2.6 | 20 | 38100                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_20                                                                           | P160                                                                                | BN160L4                                                                                 | 172                                                                                 |
| 97                      | 1280                 | 0.9 | 15 | 9360                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_15                                                                           | P160                                                                                | BN160L4                                                                                 | 150                                                                                 |
| 97                      | 1295                 | 1.4 | 15 | 13200                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_15                                                                           | P160                                                                                | BN160L4                                                                                 | 158                                                                                 |
| 97                      | 1295                 | 2.2 | 15 | 27000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_15                                                                           | P160                                                                                | BN160L4                                                                                 | 166                                                                                 |
| 97                      | 1295                 | 3.1 | 15 | 35100                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_15                                                                           | P160                                                                                | BN160L4                                                                                 | 172                                                                                 |
| 139                     | 920                  | 2.2 | 7  | 11400                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_7                                                                            | P180                                                                                | BN180L6                                                                                 | 158                                                                                 |
| 146                     | 863                  | 1.2 | 10 | 8720                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_10                                                                           | P160                                                                                | BN160L4                                                                                 | 150                                                                                 |
| 146                     | 873                  | 3.0 | 10 | 24000                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_10                                                                           | P160                                                                                | BN160L4                                                                                 | 166                                                                                 |
| 147                     | 860                  | 2.0 | 20 | 12700                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_20                                                                           | P160                                                                                | BN160MB2                                                                                | 158                                                                                 |
| 195                     | 653                  | 2.1 | 15 | 11600                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_15                                                                           | P160                                                                                | BN160MB2                                                                                | 158                                                                                 |
| 195                     | 653                  | 3.3 | 15 | 22700                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_15                                                                           | P160                                                                                | BN160MB2                                                                                | 166                                                                                 |
| 209                     | 618                  | 1.6 | 7  | 7840                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_7                                                                            | P160                                                                                | BN160L4                                                                                 | 150                                                                                 |
| 293                     | 440                  | 1.8 | 10 | 7960                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_10                                                                           | P160                                                                                | BN160MB2                                                                                | 150                                                                                 |
| 419                     | 311                  | 2.4 | 7  | 7120                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_7                                                                            | P160                                                                                | BN160MB2                                                                                | 150                                                                                 |

## 18.5 kW

| n <sub>2</sub><br>min-1 | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------|----------------------|-----|----|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 19.2                    | 6717                 | 0.9 | 50 | 50000                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_50                                                                             | P200                                                                                  | BN200LA6                                                                                  | 172                                                                                   |
| 24.0                    | 5595                 | 1.2 | 40 | 48700                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_40                                                                             | P200                                                                                  | BN200LA6                                                                                  | 172                                                                                   |
| 29.2                    | 4598                 | 1.0 | 50 | 47000                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_50                                                                             | P180                                                                                  | BN180M4                                                                                   | 172                                                                                   |
| 32                      | 4472                 | 1.2 | 30 | 45200                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_30                                                                             | P200                                                                                  | BN200LA6                                                                                  | 172                                                                                   |



## 18.5 kW

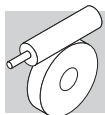
| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 37                                  | 3776                 | 0.9 | 40 | 31500                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_40                                                                           | P180                                                                                | BN180M4                                                                                 | 166                                                                                 |
| 37                                  | 3824                 | 1.3 | 40 | 44900                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_40                                                                           | P180                                                                                | BN180M4                                                                                 | 172                                                                                 |
| 49                                  | 3013                 | 1.0 | 30 | 31200                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_30                                                                           | P180                                                                                | BN180M4                                                                                 | 166                                                                                 |
| 49                                  | 3049                 | 1.3 | 30 | 41500                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_30                                                                           | P180                                                                                | BN180M4                                                                                 | 172                                                                                 |
| 64                                  | 2374                 | 1.4 | 15 | 28300                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_15                                                                           | P200                                                                                | BN200LA6                                                                                | 166                                                                                 |
| 64                                  | 2402                 | 2.2 | 15 | 37800                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_15                                                                           | P200                                                                                | BN200LA6                                                                                | 172                                                                                 |
| 73                                  | 2057                 | 1.1 | 20 | 13200                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_20                                                                           | P180                                                                                | BN180M4                                                                                 | 158                                                                                 |
| 73                                  | 2057                 | 1.5 | 20 | 28300                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_20                                                                           | P180                                                                                | BN180M4                                                                                 | 166                                                                                 |
| 73                                  | 2081                 | 2.1 | 20 | 37400                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_20                                                                           | P180                                                                                | BN180M4                                                                                 | 172                                                                                 |
| 97                                  | 1597                 | 1.2 | 15 | 12200                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_15                                                                           | P180                                                                                | BN180M4                                                                                 | 158                                                                                 |
| 97                                  | 1597                 | 1.8 | 15 | 26200                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_15                                                                           | P180                                                                                | BN180M4                                                                                 | 166                                                                                 |
| 97                                  | 1597                 | 2.5 | 15 | 34500                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_15                                                                           | P180                                                                                | BN180M4                                                                                 | 172                                                                                 |
| 146                                 | 1077                 | 1.7 | 10 | 11400                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_10                                                                           | P180                                                                                | BN180M4                                                                                 | 158                                                                                 |
| 146                                 | 1077                 | 2.5 | 10 | 23400                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_10                                                                           | P180                                                                                | BN180M4                                                                                 | 166                                                                                 |
| 146                                 | 1089                 | 3.4 | 10 | 37800                | —                                                                                 | —                                                                                 | —                                                                                 | VF 250_10                                                                           | P180                                                                                | BN180M4                                                                                 | 172                                                                                 |
| 195                                 | 805                  | 1.1 | 15 | 8260                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_15                                                                           | P160                                                                                | BN160L2                                                                                 | 150                                                                                 |
| 209                                 | 762                  | 2.3 | 7  | 10100                | —                                                                                 | —                                                                                 | —                                                                                 | VF 185_7                                                                            | P180                                                                                | BN180M4                                                                                 | 158                                                                                 |
| 209                                 | 762                  | 3.0 | 7  | 21200                | —                                                                                 | —                                                                                 | —                                                                                 | VF 210_7                                                                            | P180                                                                                | BN180M4                                                                                 | 166                                                                                 |
| 293                                 | 543                  | 1.5 | 10 | 7550                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_10                                                                           | P160                                                                                | BN160L2                                                                                 | 150                                                                                 |
| 419                                 | 384                  | 2.0 | 7  | 6760                 | —                                                                                 | —                                                                                 | —                                                                                 | VF 150_7                                                                            | P160                                                                                | BN160L2                                                                                 | 150                                                                                 |

## 22 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|----|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 22.5                                | 7097                 | 0.9 | 40 | 47100                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_40                                                                             | P200                                                                                  | BN200L6                                                                                   | 172                                                                                   |
| 30                                  | 5673                 | 1.0 | 30 | 43900                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_30                                                                             | P200                                                                                  | BN200L6                                                                                   | 172                                                                                   |
| 37                                  | 4532                 | 1.1 | 40 | 43900                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_40                                                                             | P180                                                                                  | BN180L4                                                                                   | 172                                                                                   |
| 49                                  | 3571                 | 0.9 | 30 | 30200                | —                                                                                   | —                                                                                   | —                                                                                   | VF 210_30                                                                             | P180                                                                                  | BN180L4                                                                                   | 166                                                                                   |
| 49                                  | 3614                 | 1.1 | 30 | 44700                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_30                                                                             | P180                                                                                  | BN180L4                                                                                   | 172                                                                                   |
| 60                                  | 3011                 | 1.1 | 15 | 27200                | —                                                                                   | —                                                                                   | —                                                                                   | VF 210_15                                                                             | P200                                                                                  | BN200L6                                                                                   | 166                                                                                   |
| 60                                  | 3046                 | 1.7 | 15 | 36900                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_15                                                                             | P200                                                                                  | BN200L6                                                                                   | 172                                                                                   |
| 73                                  | 2438                 | 0.9 | 20 | 12200                | —                                                                                   | —                                                                                   | —                                                                                   | VF 185_20                                                                             | P180                                                                                  | BN180L4                                                                                   | 158                                                                                   |
| 73                                  | 2438                 | 1.3 | 20 | 27500                | —                                                                                   | —                                                                                   | —                                                                                   | VF 210_20                                                                             | P180                                                                                  | BN180L4                                                                                   | 166                                                                                   |
| 73                                  | 2467                 | 1.8 | 20 | 36700                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_20                                                                             | P180                                                                                  | BN180L4                                                                                   | 172                                                                                   |
| 98                                  | 1893                 | 1.0 | 15 | 11300                | —                                                                                   | —                                                                                   | —                                                                                   | VF 185_15                                                                             | P180                                                                                  | BN180L4                                                                                   | 158                                                                                   |
| 98                                  | 1893                 | 1.5 | 15 | 25500                | —                                                                                   | —                                                                                   | —                                                                                   | VF 210_15                                                                             | P180                                                                                  | BN180L4                                                                                   | 166                                                                                   |
| 98                                  | 1893                 | 2.1 | 15 | 33900                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_15                                                                             | P180                                                                                  | BN180L4                                                                                   | 172                                                                                   |
| 147                                 | 1276                 | 1.4 | 10 | 10700                | —                                                                                   | —                                                                                   | —                                                                                   | VF 185_10                                                                             | P180                                                                                  | BN180L4                                                                                   | 158                                                                                   |
| 147                                 | 1276                 | 2.1 | 10 | 22900                | —                                                                                   | —                                                                                   | —                                                                                   | VF 210_10                                                                             | P180                                                                                  | BN180L4                                                                                   | 166                                                                                   |
| 147                                 | 1291                 | 2.9 | 10 | 30300                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_10                                                                             | P180                                                                                  | BN180L4                                                                                   | 172                                                                                   |
| 209                                 | 904                  | 1.9 | 7  | 9510                 | —                                                                                   | —                                                                                   | —                                                                                   | VF 185_7                                                                              | P180                                                                                  | BN180L4                                                                                   | 158                                                                                   |
| 209                                 | 904                  | 2.5 | 7  | 20800                | —                                                                                   | —                                                                                   | —                                                                                   | VF 210_7                                                                              | P180                                                                                  | BN180L4                                                                                   | 166                                                                                   |
| 209                                 | 914                  | 3.5 | 7  | 27500                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_7                                                                              | P180                                                                                  | BN180L4                                                                                   | 172                                                                                   |
| 293                                 | 645                  | 2.1 | 10 | 9730                 | —                                                                                   | —                                                                                   | —                                                                                   | VF 185_10                                                                             | P180                                                                                  | BN180M2                                                                                   | 158                                                                                   |
| 293                                 | 645                  | 3.1 | 10 | 23900                | —                                                                                   | —                                                                                   | —                                                                                   | VF 210_10                                                                             | P180                                                                                  | BN180M2                                                                                   | 166                                                                                   |
| 419                                 | 457                  | 2.9 | 7  | 8660                 | —                                                                                   | —                                                                                   | —                                                                                   | VF 185_7                                                                              | P180                                                                                  | BN180M2                                                                                   | 158                                                                                   |

## 30 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|----|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 45                                  | 5412                 | 1.1 | 20 | 37600                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_20                                                                             | P225                                                                                  | BN225M6                                                                                   | 172                                                                                   |
| 60                                  | 4154                 | 1.3 | 15 | 35000                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_15                                                                             | P225                                                                                  | BN225M6                                                                                   | 172                                                                                   |
| 74                                  | 3313                 | 0.9 | 20 | 25800                | —                                                                                   | —                                                                                   | —                                                                                   | VF 210_20                                                                             | P200                                                                                  | BN200L4                                                                                   | 166                                                                                   |
| 74                                  | 3352                 | 1.3 | 20 | 35200                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_20                                                                             | P200                                                                                  | BN200L4                                                                                   | 172                                                                                   |
| 98                                  | 2573                 | 1.1 | 15 | 24000                | —                                                                                   | —                                                                                   | —                                                                                   | VF 210_15                                                                             | P200                                                                                  | BN200L4                                                                                   | 166                                                                                   |
| 98                                  | 2573                 | 1.6 | 15 | 32600                | —                                                                                   | —                                                                                   | —                                                                                   | VF 250_15                                                                             | P200                                                                                  | BN200L4                                                                                   | 172                                                                                   |
| 147                                 | 1735                 | 1.5 | 10 | 21600                | —                                                                                   | —                                                                                   | —                                                                                   | VF 210_10                                                                             | P200                                                                                  | BN200L4                                                                                   | 166                                                                                   |



## 30 kW

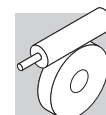
| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 147                                 | 1754                 | 2.1 | 10 | 29200                | —                                                                                 |                                                                                   |                                                                                   | VF 250_10                                                                           | P200                                                                                | BN200L4                                                                                 | 172                                                                                 |
| 210                                 | 1228                 | 1.9 | 7  | 19700                | —                                                                                 |                                                                                   |                                                                                   | VF 210_7                                                                            | P200                                                                                | BN200L4                                                                                 | 166                                                                                 |
| 210                                 | 1242                 | 2.6 | 7  | 26600                | —                                                                                 |                                                                                   |                                                                                   | VF 250_7                                                                            | P200                                                                                | BN200L4                                                                                 | 172                                                                                 |
| 295                                 | 874                  | 2.3 | 10 | 19000                | —                                                                                 |                                                                                   |                                                                                   | VF 210_10                                                                           | P200                                                                                | BN200LA2                                                                                | 166                                                                                 |
| 421                                 | 619                  | 2.8 | 7  | 17200                | —                                                                                 |                                                                                   |                                                                                   | VF 210_7                                                                            | P200                                                                                | BN200LA2                                                                                | 166                                                                                 |

## 37 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|----|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 74                                  | 4107                 | 1.1 | 20 | 22800                | —                                                                                 |                                                                                   |                                                                                   | VF 250_20                                                                           | P225                                                                                | BN225S4                                                                                 | 172                                                                                 |
| 99                                  | 3152                 | 0.9 | 15 | 22600                | —                                                                                 |                                                                                   |                                                                                   | VF 210_15                                                                           | P225                                                                                | BN225S4                                                                                 | 166                                                                                 |
| 99                                  | 3152                 | 1.3 | 15 | 31400                | —                                                                                 |                                                                                   |                                                                                   | VF 250_15                                                                           | P225                                                                                | BN225S4                                                                                 | 172                                                                                 |
| 148                                 | 2125                 | 1.2 | 10 | 20500                | —                                                                                 |                                                                                   |                                                                                   | VF 210_10                                                                           | P225                                                                                | BN225S4                                                                                 | 166                                                                                 |
| 148                                 | 2149                 | 1.7 | 10 | 28300                | —                                                                                 |                                                                                   |                                                                                   | VF 250_10                                                                           | P225                                                                                | BN225S4                                                                                 | 172                                                                                 |
| 211                                 | 1504                 | 1.5 | 7  | 18800                | —                                                                                 |                                                                                   |                                                                                   | VF 210_7                                                                            | P225                                                                                | BN225S4                                                                                 | 166                                                                                 |
| 211                                 | 1521                 | 2.1 | 7  | 25800                | —                                                                                 |                                                                                   |                                                                                   | VF 250_7                                                                            | P225                                                                                | BN225S4                                                                                 | 172                                                                                 |
| 296                                 | 1074                 | 1.9 | 10 | 18400                | —                                                                                 |                                                                                   |                                                                                   | VF 210_10                                                                           | P200                                                                                | BN200L2                                                                                 | 166                                                                                 |
| 296                                 | 1086                 | 2.6 | 10 | 24500                | —                                                                                 |                                                                                   |                                                                                   | VF 250_10                                                                           | P200                                                                                | BN200L2                                                                                 | 172                                                                                 |
| 423                                 | 760                  | 2.3 | 7  | 16800                | —                                                                                 |                                                                                   |                                                                                   | VF 210_7                                                                            | P200                                                                                | BN200L2                                                                                 | 166                                                                                 |

## 45 kW

| n <sub>2</sub><br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | S   | i  | R <sub>n2</sub><br>N |  |  |  |  |  | IEC  |  |
|-------------------------------------|----------------------|-----|----|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 74                                  | 4994                 | 0.9 | 20 | 32300                | —                                                                                   |                                                                                     |                                                                                     | VF 250_20                                                                             | P225                                                                                  | BN225M4                                                                                   | 172                                                                                   |
| 99                                  | 3833                 | 1.0 | 15 | 30100                | —                                                                                   |                                                                                     |                                                                                     | VF 250_15                                                                             | P225                                                                                  | BN225M4                                                                                   | 172                                                                                   |
| 148                                 | 2584                 | 1.0 | 10 | 19200                | —                                                                                   |                                                                                     |                                                                                     | VF 210_10                                                                             | P225                                                                                  | BN225M4                                                                                   | 166                                                                                   |
| 148                                 | 2613                 | 1.4 | 10 | 27300                | —                                                                                   |                                                                                     |                                                                                     | VF 250_10                                                                             | P225                                                                                  | BN225M4                                                                                   | 172                                                                                   |
| 211                                 | 1829                 | 1.3 | 7  | 17800                | —                                                                                   |                                                                                     |                                                                                     | VF 210_7                                                                              | P225                                                                                  | BN225M4                                                                                   | 166                                                                                   |
| 211                                 | 1850                 | 1.7 | 7  | 25000                | —                                                                                   |                                                                                     |                                                                                     | VF 250_7                                                                              | P225                                                                                  | BN225M4                                                                                   | 172                                                                                   |
| 296                                 | 1307                 | 1.5 | 10 | 17800                | —                                                                                   |                                                                                     |                                                                                     | VF 210_10                                                                             | P200                                                                                  | BN225M2                                                                                   | 166                                                                                   |
| 296                                 | 1321                 | 2.1 | 10 | 24000                | —                                                                                   |                                                                                     |                                                                                     | VF 250_10                                                                             | P200                                                                                  | BN225M2                                                                                   | 172                                                                                   |
| 423                                 | 925                  | 1.9 | 7  | 16200                | —                                                                                   |                                                                                     |                                                                                     | VF 210_7                                                                              | P200                                                                                  | BN225M2                                                                                   | 166                                                                                   |
| 423                                 | 935                  | 2.6 | 7  | 21800                | —                                                                                   |                                                                                     |                                                                                     | VF 250_7                                                                              | P200                                                                                  | BN225M2                                                                                   | 172                                                                                   |



## 22 TABELLE DATI TECNICI RIDUTTORI

### VF 27

13 Nm

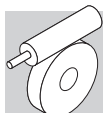
|  |                              | i  | $\eta_s$<br>% | $n_2$<br>min <sup>-1</sup> | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>%                 | $n_2$<br>min <sup>-1</sup>   | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% |  |  |
|-----------------------------------------------------------------------------------|------------------------------|----|---------------|----------------------------|----------------|----------------|---------------|---------------|-------------------------------|------------------------------|----------------|----------------|---------------|---------------|---------------|-------------------------------------------------------------------------------------|--|
| $n_1 = 2800 \text{ min}^{-1}$                                                     |                              |    |               |                            |                |                |               |               | $n_1 = 1400 \text{ min}^{-1}$ |                              |                |                |               |               |               |                                                                                     |  |
|                                                                                   |                              |    |               |                            |                |                |               |               |                               |                              |                |                |               |               |               |                                                                                     |  |
| VF 27                                                                             | VF 27_7                      | 7  | 67            | 400                        | 7              | 0.34           | —             | 330           | 86                            | 200                          | 9              | 0.23           | 35            | 410           | 83            | 177                                                                                 |  |
|                                                                                   | VF 27_10                     | 10 | 62            | 280                        | 7              | 0.24           | —             | 400           | 84                            | 140                          | 9              | 0.16           | 30            | 500           | 80            |                                                                                     |  |
|                                                                                   | VF 27_15                     | 15 | 54            | 187                        | 7              | 0.17           | —             | 480           | 79                            | 93                           | 9              | 0.12           | —             | 600           | 75            |                                                                                     |  |
|                                                                                   | VF 27_20                     | 20 | 49            | 140                        | 7              | 0.14           | —             | 540           | 76                            | 70                           | 9              | 0.09           | —             | 600           | 71            |                                                                                     |  |
|                                                                                   | VF 27_30                     | 30 | 38            | 93                         | 7              | 0.10           | —             | 600           | 69                            | 47                           | 9              | 0.07           | —             | 600           | 62            |                                                                                     |  |
|                                                                                   | VF 27_40                     | 40 | 33            | 70                         | 7              | 0.08           | —             | 600           | 64                            | 35                           | 9              | 0.06           | —             | 600           | 57            |                                                                                     |  |
|                                                                                   | VF 27_60                     | 60 | 26            | 47                         | 7              | 0.06           | —             | 600           | 56                            | 23.3                         | 9              | 0.04           | —             | 600           | 49            |                                                                                     |  |
|                                                                                   | VF 27_70                     | 70 | 24            | 40                         | 7              | 0.06           | —             | 600           | 53                            | 20.0                         | 9              | 0.04           | —             | 600           | 45            |                                                                                     |  |
|                                                                                   |                              |    |               |                            |                |                |               |               |                               |                              |                |                |               |               |               |                                                                                     |  |
|                                                                                   | $n_1 = 900 \text{ min}^{-1}$ |    |               |                            |                |                |               |               |                               | $n_1 = 500 \text{ min}^{-1}$ |                |                |               |               |               | 177                                                                                 |  |
|                                                                                   | VF 27_7                      | 7  | 67            | 129                        | 10             | 0.17           | 90            | 480           | 81                            | 71                           | 11             | 0.11           | 90            | 600           | 79            |                                                                                     |  |
|                                                                                   | VF 27_10                     | 10 | 62            | 90                         | 11             | 0.13           | 20            | 570           | 78                            | 50                           | 12             | 0.08           | 90            | 600           | 76            |                                                                                     |  |
|                                                                                   | VF 27_15                     | 15 | 54            | 60                         | 11             | 0.09           | —             | 600           | 72                            | 33                           | 12             | 0.06           | 90            | 600           | 69            |                                                                                     |  |
|                                                                                   | VF 27_20                     | 20 | 49            | 45                         | 11             | 0.08           | —             | 600           | 68                            | 25.0                         | 12             | 0.05           | 90            | 600           | 65            |                                                                                     |  |
|                                                                                   | VF 27_30                     | 30 | 38            | 30.0                       | 11             | 0.06           | —             | 600           | 59                            | 16.7                         | 13             | 0.04           | —             | 600           | 55            |                                                                                     |  |
|                                                                                   | VF 27_40                     | 40 | 33            | 22.5                       | 11             | 0.05           | —             | 600           | 54                            | 12.5                         | 13             | 0.04           | —             | 600           | 50            |                                                                                     |  |
|                                                                                   | VF 27_60                     | 60 | 26            | 15.0                       | 11             | 0.04           | —             | 600           | 45                            | 8.3                          | 12             | 0.02           | —             | 600           | 41            |                                                                                     |  |
|                                                                                   | VF 27_70                     | 70 | 24            | 12.9                       | 10             | 0.03           | —             | 600           | 42                            | 7.1                          | 11             | 0.02           | —             | 600           | 38            |                                                                                     |  |

### VF 30

24 Nm

|  |                              | i  | $\eta_s$<br>% | $n_2$                         | $M_{n2}$ | $P_{n1}$ | $R_{n1}$                     | $R_{n2}$ | $\eta_d$ | $n_2$                         | $M_{n2}$ | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |     |
|-------------------------------------------------------------------------------------|------------------------------|----|---------------|-------------------------------|----------|----------|------------------------------|----------|----------|-------------------------------|----------|----------|----------|----------|----------|---------------------------------------------------------------------------------------|-----|
|                                                                                     |                              |    |               | $\text{min}^{-1}$             | Nm       | kW       | N                            | N        | %        | $\text{min}^{-1}$             | Nm       | kW       | N        | N        | %        |                                                                                       |     |
|                                                                                     |                              |    |               | $n_1 = 2800 \text{ min}^{-1}$ |          |          |                              |          |          | $n_1 = 1400 \text{ min}^{-1}$ |          |          |          |          |          |                                                                                       |     |
| VF 30                                                                               | VF 30_7                      | 7  | 69            | 400                           | 12       | 0.58     | 120                          | 510      | 87       | 200                           | 16       | 0.41     | 140      | 630      | 84       | 178                                                                                   |     |
|                                                                                     | VF 30_10                     | 10 | 64            | 280                           | 12       | 0.41     | 70                           | 620      | 85       | 140                           | 16       | 0.30     | 80       | 770      | 81       |                                                                                       |     |
|                                                                                     | VF 30_15                     | 15 | 56            | 187                           | 14       | 0.34     | —                            | 720      | 81       | 93                            | 18       | 0.24     | —        | 910      | 76       |                                                                                       |     |
|                                                                                     | VF 30_20                     | 20 | 51            | 140                           | 14       | 0.26     | —                            | 820      | 78       | 70                            | 18       | 0.19     | —        | 1030     | 73       |                                                                                       |     |
|                                                                                     | VF 30_30                     | 30 | 41            | 93                            | 15       | 0.21     | —                            | 960      | 71       | 47                            | 20       | 0.15     | —        | 1200     | 65       |                                                                                       |     |
|                                                                                     | VF 30_40                     | 40 | 36            | 70                            | 14       | 0.16     | —                            | 1090     | 66       | 35                            | 19       | 0.12     | —        | 1360     | 60       |                                                                                       |     |
|                                                                                     | VF 30_60                     | 60 | 29            | 47                            | 14       | 0.12     | —                            | 1270     | 59       | 23.3                          | 19       | 0.09     | —        | 1590     | 51       |                                                                                       |     |
|                                                                                     | VF 30_70                     | 70 | 26            | 40                            | 11       | 0.08     | —                            | 1380     | 55       | 20.0                          | 15       | 0.07     | —        | 1600     | 48       | 178                                                                                   |     |
|                                                                                     |                              |    |               |                               |          |          |                              |          |          |                               |          |          |          |          |          |                                                                                       |     |
|                                                                                     | $n_1 = 900 \text{ min}^{-1}$ |    |               |                               |          |          | $n_1 = 500 \text{ min}^{-1}$ |          |          |                               |          |          |          |          |          |                                                                                       |     |
|                                                                                     | VF 30_7                      | 7  | 69            | 129                           | 18       | 0.30     | 150                          | 730      | 82       | 71                            | 20       | 0.19     | 150      | 920      | 81       |                                                                                       | 178 |
|                                                                                     | VF 30_10                     | 10 | 64            | 90                            | 18       | 0.22     | 150                          | 900      | 79       | 50                            | 20       | 0.14     | 150      | 1120     | 77       |                                                                                       |     |
|                                                                                     | VF 30_15                     | 15 | 56            | 60                            | 20       | 0.17     | —                            | 1060     | 74       | 33                            | 22       | 0.11     | 150      | 1320     | 71       |                                                                                       |     |
|                                                                                     | VF 30_20                     | 20 | 51            | 45                            | 20       | 0.14     | —                            | 1200     | 70       | 25.0                          | 22       | 0.09     | 150      | 1490     | 67       |                                                                                       |     |
| VF 30_30                                                                            | 30                           | 41 | 30            | 22                            | 0.12     | —        | 1400                         | 61       | 16.7     | 24                            | 0.07     | —        | 1700     | 58       |          |                                                                                       |     |
| VF 30_40                                                                            | 40                           | 36 | 23            | 20                            | 0.09     | —        | 1590                         | 56       | 12.5     | 22                            | 0.06     | —        | 1700     | 53       |          |                                                                                       |     |
| VF 30_60                                                                            | 60                           | 29 | 15            | 20                            | 0.07     | —        | 1650                         | 48       | 8.3      | 22                            | 0.05     | —        | 1700     | 44       |          |                                                                                       |     |
| VF 30_70                                                                            | 70                           | 26 | 13            | 17                            | 0.05     | —        | 1700                         | 45       | 7.0      | 19                            | 0.04     | —        | 1700     | 41       |          |                                                                                       |     |

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)



## VF 44 - VF/VF 30/44

55 Nm

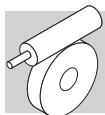
|  | i         | $\eta_s$<br>% | $n_2$<br>min <sup>-1</sup>    | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% | $n_2$<br>min <sup>-1</sup> | $M_{n2}$<br>Nm                | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% |  |     |  |
|-----------------------------------------------------------------------------------|-----------|---------------|-------------------------------|----------------|----------------|---------------|---------------|---------------|----------------------------|-------------------------------|----------------|---------------|---------------|---------------|-------------------------------------------------------------------------------------|-----|--|
|                                                                                   |           |               | $n_1 = 2800 \text{ min}^{-1}$ |                |                |               |               |               |                            | $n_1 = 1400 \text{ min}^{-1}$ |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
| VF 44                                                                             | VF 44_7   | 7             | 71                            | 400            | 22             | 1.1           | 220           | 950           | 88                         | 200                           | 29             | 0.71          | 220           | 1180          | 86                                                                                  | 178 |  |
|                                                                                   | VF 44_10  | 10            | 66                            | 280            | 22             | 0.74          | 220           | 1150          | 87                         | 140                           | 29             | 0.51          | 220           | 1430          | 84                                                                                  |     |  |
|                                                                                   | VF 44_14  | 14            | 60                            | 200            | 22             | 0.55          | 220           | 1340          | 84                         | 100                           | 29             | 0.37          | 220           | 1680          | 81                                                                                  |     |  |
|                                                                                   | VF 44_20  | 20            | 55                            | 140            | 29             | 0.52          | 220           | 1490          | 81                         | 70                            | 39             | 0.37          | 220           | 1860          | 77                                                                                  |     |  |
|                                                                                   | VF 44_28  | 28            | 45                            | 100            | 29             | 0.40          | 220           | 1710          | 76                         | 50                            | 39             | 0.29          | 220           | 2140          | 71                                                                                  |     |  |
|                                                                                   | VF 44_35  | 35            | 42                            | 80             | 29             | 0.33          | 220           | 1870          | 73                         | 40                            | 39             | 0.25          | 220           | 2300          | 68                                                                                  |     |  |
|                                                                                   | VF 44_46  | 46            | 37                            | 61             | 29             | 0.27          | 220           | 2080          | 69                         | 30.0                          | 39             | 0.19          | 220           | 2300          | 63                                                                                  |     |  |
|                                                                                   | VF 44_60  | 60            | 32                            | 47             | 29             | 0.22          | 220           | 2290          | 65                         | 23.3                          | 39             | 0.16          | 220           | 2300          | 58                                                                                  |     |  |
|                                                                                   | VF 44_70  | 70            | 30                            | 40             | 22             | 0.15          | 220           | 2300          | 62                         | 20.0                          | 29             | 0.11          | 220           | 2300          | 55                                                                                  |     |  |
|                                                                                   | VF 44_100 | 100           | 24                            | 28             | 21             | 0.11          | 220           | 2300          | 55                         | 14.0                          | 28             | 0.09          | 220           | 2300          | 47                                                                                  |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |
|                                                                                   |           |               |                               |                |                |               |               |               |                            |                               |                |               |               |               |                                                                                     |     |  |

70 Nm

|  |                  | i    | $\eta_s$<br>% | $n_2$<br>min <sup>-1</sup>    | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% | $n_2$<br>min <sup>-1</sup>   | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% |  |
|-------------------------------------------------------------------------------------|------------------|------|---------------|-------------------------------|----------------|----------------|---------------|---------------|---------------|------------------------------|----------------|----------------|---------------|---------------|---------------|---------------------------------------------------------------------------------------|
|                                                                                     |                  |      |               | $n_1 = 1400 \text{ min}^{-1}$ |                |                |               |               |               | $n_1 = 900 \text{ min}^{-1}$ |                |                |               |               |               |                                                                                       |
|                                                                                     |                  |      |               |                               |                |                |               |               |               |                              |                |                |               |               |               |                                                                                       |
| VF/VF 30/44                                                                         | VF/VF 30/44_245  | 245  | 29            | 5.7                           | 60             | 0.09           | 140           | 2500          | 40            | 3.7                          | 70             | 0.07           | 150           | 2500          | 38            | 180                                                                                   |
|                                                                                     | VF/VF 30/44_350  | 350  | 27            | 4.0                           | 60             | 0.07           | 80            | 2500          | 36            | 2.6                          | 70             | 0.05           | 150           | 2500          | 38            |                                                                                       |
|                                                                                     | VF/VF 30/44_420  | 420  | 25            | 3.3                           | 60             | 0.06           | —             | 2500          | 35            | 2.1                          | 70             | 0.04           | —             | 2500          | 39            |                                                                                       |
|                                                                                     | VF/VF 30/44_560  | 560  | 23            | 2.5                           | 60             | 0.05           | —             | 2500          | 31            | 1.6                          | 70             | 0.04           | —             | 2500          | 29            |                                                                                       |
|                                                                                     | VF/VF 30/44_700  | 700  | 21            | 2.0                           | 60             | 0.04           | —             | 2500          | 31            | 1.3                          | 70             | 0.03           | —             | 2500          | 31            |                                                                                       |
|                                                                                     | VF/VF 30/44_840  | 840  | 18            | 1.7                           | 60             | 0.04           | —             | 2500          | 26            | 1.1                          | 70             | 0.03           | —             | 2500          | 26            |                                                                                       |
|                                                                                     | VF/VF 30/44_1120 | 1120 | 16            | 1.3                           | 60             | 0.03           | —             | 2500          | 26            | 0.80                         | 70             | 0.02           | —             | 2500          | 29            |                                                                                       |
|                                                                                     | VF/VF 30/44_1680 | 1680 | 13            | 0.83                          | 60             | 0.02           | —             | 2500          | 26            | 0.54                         | 70             | 0.02           | —             | 2500          | 20            |                                                                                       |
|                                                                                     | VF/VF 30/44_2100 | 2100 | 12            | 0.67                          | 60             | 0.02           | —             | 2500          | 21            | 0.43                         | 70             | 0.02           | —             | 2500          | 16            |                                                                                       |

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)



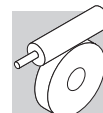


## VF/VF 30/49

100 Nm

|  |                  | i    | $\eta_s$<br>% | $n_1 = 1400 \text{ min}^{-1}$ |               |               |               |                            |                | $n_1 = 900 \text{ min}^{-1}$ |               |               |               |      |    |  |
|-----------------------------------------------------------------------------------|------------------|------|---------------|-------------------------------|---------------|---------------|---------------|----------------------------|----------------|------------------------------|---------------|---------------|---------------|------|----|-------------------------------------------------------------------------------------|
| $n_2$<br>min <sup>-1</sup>                                                        | $M_{n2}$<br>Nm   |      |               | $P_{n1}$<br>kW                | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% | $n_2$<br>min <sup>-1</sup> | $M_{n2}$<br>Nm | $P_{n1}$<br>kW               | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% |      |    |                                                                                     |
| VF/VF 30/49                                                                       | VF/VF 30/49_240  | 240  | 32            | 5.8                           | 95            | 0.13          | 80            | 3450                       | 45             | 3.8                          | 100           | 0.09          | 150           | 3450 | 44 | 180                                                                                 |
|                                                                                   | VF/VF 30/49_315  | 315  | 24            | 4.4                           | 95            | 0.11          | 140           | 3450                       | 40             | 2.9                          | 100           | 0.07          | 150           | 3450 | 43 |                                                                                     |
|                                                                                   | VF/VF 30/49_420  | 420  | 24            | 3.3                           | 95            | 0.08          | —             | 3450                       | 41             | 2.1                          | 100           | 0.06          | —             | 3450 | 37 |                                                                                     |
|                                                                                   | VF/VF 30/49_540  | 540  | 22            | 2.6                           | 95            | 0.07          | —             | 3450                       | 37             | 1.7                          | 100           | 0.05          | —             | 3450 | 35 |                                                                                     |
|                                                                                   | VF/VF 30/49_720  | 720  | 20            | 1.9                           | 95            | 0.05          | —             | 3450                       | 39             | 1.3                          | 100           | 0.04          | —             | 3450 | 33 |                                                                                     |
|                                                                                   | VF/VF 30/49_900  | 900  | 18            | 1.6                           | 95            | 0.05          | —             | 3450                       | 31             | 1.0                          | 100           | 0.04          | —             | 3450 | 26 |                                                                                     |
|                                                                                   | VF/VF 30/49_1120 | 1120 | 15            | 1.3                           | 95            | 0.04          | —             | 3450                       | 31             | 0.80                         | 100           | 0.03          | —             | 3450 | 28 |                                                                                     |
|                                                                                   | VF/VF 30/49_1440 | 1440 | 14            | 0.97                          | 95            | 0.04          | —             | 3450                       | 24             | 0.63                         | 100           | 0.03          | —             | 3450 | 22 |                                                                                     |
|                                                                                   | VF/VF 30/49_2160 | 2160 | 11            | 0.65                          | 95            | 0.03          | —             | 3450                       | 21             | 0.42                         | 100           | 0.02          | —             | 3450 | 22 |                                                                                     |
| VF/VF 30/49_2700                                                                  | 2700             | 10   | 0.52          | 95                            | 0.03          | —             | 3450          | 17                         | 0.33           | 100                          | 0.02          | —             | 3450          | 17   |    |                                                                                     |

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)

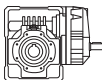


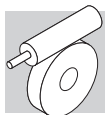
## W 63 - WR 63

190 Nm

|  | i        | $\eta_s$<br>% | $n_2$                         | $M_{n2}$                     | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ | $n_2$                         | $M_{n2}$                     | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |     |
|-----------------------------------------------------------------------------------|----------|---------------|-------------------------------|------------------------------|----------|----------|----------|----------|-------------------------------|------------------------------|----------|----------|----------|----------|-------------------------------------------------------------------------------------|-----|
|                                                                                   |          |               | min <sup>-1</sup>             | Nm                           | kW       | N        | N        | %        | min <sup>-1</sup>             | Nm                           | kW       | N        | N        | %        |                                                                                     |     |
|                                                                                   |          |               | $n_1 = 2800 \text{ min}^{-1}$ |                              |          |          |          |          | $n_1 = 1400 \text{ min}^{-1}$ |                              |          |          |          |          |                                                                                     |     |
| W 63                                                                              | W 63_7   | 7             | 70                            | 400                          | 105      | 4.9      | 480      | 1010     | 90                            | 200                          | 120      | 2.9      | 480      | 1550     | 88                                                                                  | 178 |
|                                                                                   | W 63_10  | 10            | 66                            | 280                          | 125      | 4.2      | 370      | 1360     | 88                            | 140                          | 140      | 2.4      | 480      | 1840     | 86                                                                                  |     |
|                                                                                   | W 63_12  | 12            | 63                            | 233                          | 125      | 3.5      | 435      | 1540     | 87                            | 117                          | 140      | 2.0      | 480      | 2070     | 85                                                                                  |     |
|                                                                                   | W 63_15  | 15            | 59                            | 187                          | 125      | 2.8      | 410      | 1770     | 86                            | 93                           | 150      | 1.8      | 480      | 2280     | 83                                                                                  |     |
|                                                                                   | W 63_19  | 19            | 55                            | 147                          | 130      | 2.4      | 310      | 1990     | 84                            | 74                           | 150      | 1.4      | 480      | 2600     | 81                                                                                  |     |
|                                                                                   | W 63_24  | 24            | 52                            | 117                          | 130      | 1.9      | 370      | 2250     | 82                            | 58                           | 155      | 1.2      | 480      | 2890     | 78                                                                                  |     |
|                                                                                   | W 63_30  | 30            | 44                            | 93                           | 125      | 1.6      | 440      | 2540     | 78                            | 47                           | 160      | 1.1      | 460      | 3170     | 74                                                                                  |     |
|                                                                                   | W 63_38  | 38            | 40                            | 74                           | 130      | 1.3      | 330      | 2800     | 75                            | 37                           | 155      | 0.85     | 480      | 3580     | 70                                                                                  |     |
|                                                                                   | W 63_45  | 45            | 37                            | 62                           | 130      | 1.2      | 380      | 3020     | 73                            | 31                           | 145      | 0.71     | 480      | 3920     | 67                                                                                  |     |
|                                                                                   | W 63_64  | 64            | 31                            | 44                           | 110      | 0.75     | 480      | 3650     | 67                            | 21.9                         | 125      | 0.47     | 480      | 4680     | 61                                                                                  |     |
|                                                                                   | W 63_80  | 80            | 27                            | 35                           | 100      | 0.59     | 480      | 4050     | 62                            | 17.5                         | 115      | 0.38     | 480      | 5000     | 56                                                                                  |     |
|                                                                                   | W 63_100 | 100           | 23                            | 28                           | 100      | 0.51     | 480      | 4420     | 58                            | 14.0                         | 115      | 0.33     | 480      | 5000     | 51                                                                                  |     |
|                                                                                   |          |               |                               |                              |          |          |          |          |                               |                              |          |          |          |          |                                                                                     |     |
|                                                                                   |          |               |                               | $n_1 = 900 \text{ min}^{-1}$ |          |          |          |          |                               | $n_1 = 500 \text{ min}^{-1}$ |          |          |          |          |                                                                                     | 178 |
|                                                                                   | W 63_7   | 7             | 70                            | 129                          | 130      | 2.0      | 480      | 1870     | 87                            | 71                           | 140      | 1.2      | 480      | 2420     | 84                                                                                  |     |
|                                                                                   | W 63_10  | 10            | 66                            | 90                           | 150      | 1.7      | 480      | 2220     | 84                            | 50                           | 165      | 1.1      | 480      | 2830     | 81                                                                                  |     |
|                                                                                   | W 63_12  | 12            | 63                            | 75                           | 150      | 1.4      | 480      | 2480     | 82                            | 42                           | 165      | 0.92     | 480      | 3140     | 79                                                                                  |     |
|                                                                                   | W 63_15  | 15            | 59                            | 60                           | 160      | 1.3      | 480      | 2740     | 80                            | 33                           | 180      | 0.83     | 480      | 3430     | 76                                                                                  |     |
|                                                                                   | W 63_19  | 19            | 55                            | 47                           | 160      | 1.0      | 480      | 3100     | 78                            | 26.3                         | 180      | 0.68     | 480      | 3860     | 73                                                                                  |     |
|                                                                                   | W 63_24  | 24            | 52                            | 38                           | 165      | 0.86     | 480      | 3440     | 75                            | 20.8                         | 185      | 0.58     | 480      | 4280     | 70                                                                                  |     |
|                                                                                   | W 63_30  | 30            | 44                            | 30                           | 170      | 0.76     | 480      | 3770     | 70                            | 16.7                         | 190      | 0.52     | 480      | 4690     | 64                                                                                  |     |
|                                                                                   | W 63_38  | 38            | 40                            | 23.7                         | 165      | 0.62     | 480      | 4240     | 66                            | 13.2                         | 185      | 0.42     | 480      | 5000     | 61                                                                                  |     |
|                                                                                   | W 63_45  | 45            | 37                            | 20.0                         | 155      | 0.52     | 480      | 4630     | 63                            | 11.1                         | 170      | 0.34     | 480      | 5000     | 58                                                                                  |     |
|                                                                                   | W 63_64  | 64            | 31                            | 14.1                         | 135      | 0.35     | 480      | 5000     | 56                            | 7.8                          | 150      | 0.24     | 480      | 5000     | 51                                                                                  |     |
|                                                                                   | W 63_80  | 80            | 27                            | 11.3                         | 125      | 0.28     | 480      | 5000     | 52                            | 6.3                          | 135      | 0.19     | 480      | 5000     | 46                                                                                  |     |
|                                                                                   | W 63_100 | 100           | 23                            | 9.0                          | 120      | 0.25     | 480      | 5000     | 46                            | 5.0                          | 130      | 0.17     | 480      | 5000     | 41                                                                                  |     |

220 Nm

|  |           | i   | $\eta_s$<br>% | $n_2$                         | $M_{n2}$                     | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ | $n_2$                        | $M_{n2}$                      | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |
|-------------------------------------------------------------------------------------|-----------|-----|---------------|-------------------------------|------------------------------|----------|----------|----------|----------|------------------------------|-------------------------------|----------|----------|----------|----------|---------------------------------------------------------------------------------------|
|                                                                                     |           |     |               | min <sup>-1</sup>             | Nm                           | kW       | N        | N        | %        | min <sup>-1</sup>            | Nm                            | kW       | N        | N        | %        |                                                                                       |
|                                                                                     |           |     |               | $n_1 = 2800 \text{ min}^{-1}$ |                              |          |          |          |          |                              | $n_1 = 1400 \text{ min}^{-1}$ |          |          |          |          |                                                                                       |
| WR 63                                                                               | WR 63_21  | 21  | 69            | 133                           | 130                          | 2.1      | 180      | 1840     | 87       | 67                           | 140                           | 1.2      | 320      | 2510     | 84       | 179                                                                                   |
|                                                                                     | WR 63_30  | 30  | 65            | 93                            | 150                          | 1.7      | 300      | 2180     | 84       | 47                           | 165                           | 1.0      | 320      | 2920     | 81       |                                                                                       |
|                                                                                     | WR 63_36  | 36  | 62            | 78                            | 150                          | 1.5      | 320      | 2430     | 82       | 39                           | 165                           | 0.85     | 320      | 3240     | 79       |                                                                                       |
|                                                                                     | WR 63_45  | 45  | 58            | 62                            | 160                          | 1.3      | 320      | 2690     | 80       | 31                           | 180                           | 0.77     | 320      | 3540     | 76       |                                                                                       |
|                                                                                     | WR 63_57  | 57  | 54            | 49                            | 160                          | 1.1      | 320      | 3050     | 78       | 24.6                         | 180                           | 0.63     | 320      | 3980     | 73       |                                                                                       |
|                                                                                     | WR 63_72  | 72  | 51            | 39                            | 165                          | 0.90     | 320      | 3390     | 75       | 19.4                         | 185                           | 0.54     | 320      | 4410     | 70       |                                                                                       |
|                                                                                     | WR 63_90  | 90  | 44            | 31                            | 170                          | 0.79     | 320      | 3710     | 70       | 15.6                         | 190                           | 0.48     | 320      | 4830     | 64       |                                                                                       |
|                                                                                     | WR 63_114 | 114 | 39            | 24.6                          | 165                          | 0.62     | 320      | 4170     | 68       | 12.3                         | 185                           | 0.39     | 320      | 5000     | 61       |                                                                                       |
|                                                                                     | WR 63_135 | 135 | 36            | 20.7                          | 155                          | 0.53     | 320      | 4560     | 63       | 10.4                         | 170                           | 0.32     | 320      | 5000     | 58       |                                                                                       |
|                                                                                     | WR 63_192 | 192 | 30            | 14.6                          | 135                          | 0.37     | 320      | 5000     | 56       | 7.3                          | 150                           | 0.22     | 320      | 5000     | 51       |                                                                                       |
|                                                                                     | WR 63_240 | 240 | 26            | 11.7                          | 125                          | 0.29     | 320      | 5000     | 52       | 5.8                          | 135                           | 0.18     | 320      | 5000     | 46       |                                                                                       |
|                                                                                     | WR 63_300 | 300 | 22            | 9.3                           | 120                          | 0.25     | 320      | 5000     | 46       | 4.7                          | 130                           | 0.15     | 320      | 5000     | 41       |                                                                                       |
|                                                                                     |           |     |               |                               |                              |          |          |          |          |                              |                               |          |          |          |          |                                                                                       |
|                                                                                     |           |     |               |                               | $n_1 = 900 \text{ min}^{-1}$ |          |          |          |          | $n_1 = 500 \text{ min}^{-1}$ |                               |          |          |          | 179      |                                                                                       |
|                                                                                     | WR 63_21  | 21  | 69            | 43                            | 155                          | 0.85     | 320      | 2960     | 82       | 23.8                         | 170                           | 0.53     | 320      | 3750     |          | 80                                                                                    |
|                                                                                     | WR 63_30  | 30  | 65            | 30                            | 180                          | 0.72     | 320      | 3470     | 79       | 16.7                         | 200                           | 0.45     | 320      | 4360     |          | 77                                                                                    |
|                                                                                     | WR 63_36  | 36  | 62            | 25.0                          | 180                          | 0.61     | 320      | 3830     | 77       | 14.0                         | 200                           | 0.40     | 320      | 4790     |          | 74                                                                                    |
|                                                                                     | WR 63_45  | 45  | 58            | 20.0                          | 190                          | 0.54     | 320      | 4230     | 74       | 11.1                         | 200                           | 0.33     | 320      | 5000     |          | 71                                                                                    |
|                                                                                     | WR 63_57  | 57  | 54            | 15.8                          | 190                          | 0.44     | 320      | 4740     | 71       | 8.8                          | 200                           | 0.27     | 320      | 5000     |          | 68                                                                                    |
|                                                                                     | WR 63_72  | 72  | 51            | 12.5                          | 190                          | 0.37     | 320      | 5000     | 68       | 6.9                          | 190                           | 0.22     | 320      | 5000     |          | 64                                                                                    |
|                                                                                     | WR 63_90  | 90  | 44            | 10.0                          | 205                          | 0.35     | 320      | 5000     | 62       | 5.6                          | 220                           | 0.22     | 320      | 5000     |          | 58                                                                                    |
|                                                                                     | WR 63_114 | 114 | 39            | 7.9                           | 200                          | 0.29     | 320      | 5000     | 58       | 4.4                          | 210                           | 0.18     | 320      | 5000     |          | 54                                                                                    |
|                                                                                     | WR 63_135 | 135 | 36            | 6.7                           | 180                          | 0.23     | 320      | 5000     | 54       | 3.7                          | 190                           | 0.15     | 320      | 5000     |          | 50                                                                                    |
|                                                                                     | WR 63_192 | 192 | 30            | 4.7                           | 150                          | 0.16     | 320      | 5000     | 47       | 2.6                          | 150                           | 0.10     | 320      | 5000     |          | 43                                                                                    |
|                                                                                     | WR 63_240 | 240 | 26            | 3.8                           | 140                          | 0.13     | 320      | 5000     | 43       | 2.1                          | 140                           | 0.08     | 320      | 5000     |          | 39                                                                                    |
|                                                                                     | WR 63_300 | 300 | 22            | 3.0                           | 130                          | 0.11     | 320      | 5000     | 38       | 1.7                          | 130                           | 0.07     | 320      | 5000     |          | 34                                                                                    |

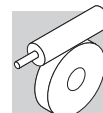


## VF/W 30/63

230 Nm

|            |  | i    | $\eta_s$<br>% | $n_1 = 1400 \text{ min}^{-1}$ |                |                |               |               |               | $n_1 = 900 \text{ min}^{-1}$ |                |                |               |               |               |  |
|------------|-----------------------------------------------------------------------------------|------|---------------|-------------------------------|----------------|----------------|---------------|---------------|---------------|------------------------------|----------------|----------------|---------------|---------------|---------------|-------------------------------------------------------------------------------------|
|            |                                                                                   |      |               | $n_2$<br>$\text{min}^{-1}$    | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% | $n_2$<br>$\text{min}^{-1}$   | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% |                                                                                     |
| VF/W 30/63 | VF/W 30/63_240                                                                    | 240  | 33            | 5.8                           | 210            | 0.27           | 80            | 5000          | 47            | 3.8                          | 230            | 0.20           | 150           | 5000          | 45            | 180                                                                                 |
|            | VF/W 30/63_315                                                                    | 315  | 26            | 4.4                           | 210            | 0.23           | 140           | 5000          | 42            | 2.9                          | 230            | 0.17           | 150           | 5000          | 41            |                                                                                     |
|            | VF/W 30/63_450                                                                    | 450  | 25            | 3.1                           | 210            | 0.17           | —             | 5000          | 41            | 2.0                          | 230            | 0.11           | —             | 5000          | 42            |                                                                                     |
|            | VF/W 30/63_570                                                                    | 570  | 22            | 2.5                           | 210            | 0.14           | —             | 5000          | 40            | 1.6                          | 230            | 0.11           | —             | 5000          | 36            |                                                                                     |
|            | VF/W 30/63_720                                                                    | 720  | 21            | 1.9                           | 210            | 0.12           | —             | 5000          | 37            | 1.3                          | 230            | 0.09           | —             | 5000          | 32            |                                                                                     |
|            | VF/W 30/63_900                                                                    | 900  | 18            | 1.6                           | 210            | 0.11           | —             | 5000          | 30            | 1.0                          | 230            | 0.08           | —             | 5000          | 29            |                                                                                     |
|            | VF/W 30/63_1200                                                                   | 1200 | 16            | 1.2                           | 210            | 0.11           | —             | 5000          | 24            | 0.75                         | 230            | 0.07           | —             | 5000          | 25            |                                                                                     |
|            | VF/W 30/63_1520                                                                   | 1520 | 14            | 0.92                          | 210            | 0.08           | —             | 5000          | 24            | 0.59                         | 230            | 0.06           | —             | 5000          | 23            |                                                                                     |
|            | VF/W 30/63_2280                                                                   | 2280 | 12            | 0.61                          | 210            | 0.06           | —             | 5000          | 21            | 0.39                         | 230            | 0.04           | —             | 5000          | 23            |                                                                                     |
|            | VF/W 30/63_2700                                                                   | 2700 | 11            | 0.52                          | 210            | 0.05           | —             | 5000          | 22            | 0.33                         | 230            | 0.04           | —             | 5000          | 19            |                                                                                     |

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)

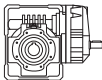


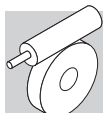
## W 75 - WR 75

320 Nm

|  | i        | $\eta_s$<br>% | $n_2$<br>min <sup>-1</sup>    | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% | $n_2$<br>min <sup>-1</sup>   | $M_{n2}$<br>Nm | $P_{n1}$<br>kW                | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% |  |     |  |
|-----------------------------------------------------------------------------------|----------|---------------|-------------------------------|----------------|----------------|---------------|---------------|---------------|------------------------------|----------------|-------------------------------|---------------|---------------|---------------|-------------------------------------------------------------------------------------|-----|--|
|                                                                                   |          |               | $n_1 = 2800 \text{ min}^{-1}$ |                |                |               |               |               |                              |                | $n_1 = 1400 \text{ min}^{-1}$ |               |               |               |                                                                                     |     |  |
|                                                                                   |          |               |                               |                |                |               |               |               |                              |                |                               |               |               |               |                                                                                     |     |  |
| W 75                                                                              | W 75_7   | 7             | 71                            | 400            | 170            | 7.8           | 750           | 700           | 91                           | 200            | 190                           | 4.4           | 750           | 1530          | 90                                                                                  | 178 |  |
|                                                                                   | W 75_10  | 10            | 67                            | 280            | 205            | 6.7           | 750           | 1610          | 90                           | 140            | 230                           | 3.8           | 750           | 2240          | 88                                                                                  |     |  |
|                                                                                   | W 75_15  | 15            | 60                            | 187            | 225            | 5.0           | 750           | 2120          | 88                           | 93             | 250                           | 2.9           | 750           | 2870          | 85                                                                                  |     |  |
|                                                                                   | W 75_20  | 20            | 56                            | 140            | 225            | 3.8           | 750           | 2550          | 86                           | 70             | 250                           | 2.2           | 750           | 3410          | 83                                                                                  |     |  |
|                                                                                   | W 75_25  | 25            | 52                            | 112            | 225            | 3.2           | 750           | 2900          | 83                           | 56             | 250                           | 1.8           | 750           | 3840          | 80                                                                                  |     |  |
|                                                                                   | W 75_30  | 30            | 45                            | 93             | 240            | 2.9           | 750           | 3100          | 81                           | 47             | 270                           | 1.7           | 750           | 4090          | 77                                                                                  |     |  |
|                                                                                   | W 75_40  | 40            | 40                            | 70             | 225            | 2.1           | 750           | 3660          | 77                           | 35             | 255                           | 1.3           | 750           | 4770          | 72                                                                                  |     |  |
|                                                                                   | W 75_50  | 50            | 36                            | 56             | 195            | 1.6           | 750           | 4180          | 73                           | 28.0           | 220                           | 0.95          | 750           | 5410          | 68                                                                                  |     |  |
|                                                                                   | W 75_60  | 60            | 33                            | 47             | 180            | 1.3           | 750           | 4610          | 70                           | 23.3           | 200                           | 0.75          | 750           | 5960          | 65                                                                                  |     |  |
|                                                                                   | W 75_80  | 80            | 28                            | 35             | 160            | 0.90          | 750           | 5310          | 65                           | 17.5           | 180                           | 0.56          | 750           | 6200          | 59                                                                                  |     |  |
|                                                                                   | W 75_100 | 100           | 25                            | 28.0           | 135            | 0.65          | 750           | 5960          | 61                           | 14.0           | 150                           | 0.40          | 750           | 6200          | 55                                                                                  |     |  |
|                                                                                   |          |               | $n_1 = 900 \text{ min}^{-1}$  |                |                |               |               |               | $n_1 = 500 \text{ min}^{-1}$ |                |                               |               |               |               |                                                                                     |     |  |
| W 75_7                                                                            | 7        | 71            | 129                           | 205            | 3.1            | 750           | 2120          | 88            | 71                           | 225            | 2.0                           | 750           | 2940          | 86            | 178                                                                                 |     |  |
| W 75_10                                                                           | 10       | 67            | 90                            | 250            | 2.7            | 750           | 2700          | 86            | 50                           | 275            | 1.7                           | 750           | 3480          | 84            |                                                                                     |     |  |
| W 75_15                                                                           | 15       | 60            | 60                            | 270            | 2.0            | 750           | 3440          | 83            | 33                           | 295            | 1.3                           | 750           | 4380          | 80            |                                                                                     |     |  |
| W 75_20                                                                           | 20       | 56            | 45                            | 270            | 1.6            | 750           | 4050          | 80            | 25.0                         | 295            | 1.0                           | 750           | 5120          | 77            |                                                                                     |     |  |
| W 75_25                                                                           | 25       | 52            | 36                            | 270            | 1.3            | 750           | 4550          | 77            | 20.0                         | 295            | 0.85                          | 750           | 5720          | 73            |                                                                                     |     |  |
| W 75_30                                                                           | 30       | 45            | 30                            | 290            | 1.2            | 750           | 4860          | 74            | 16.7                         | 320            | 0.81                          | 750           | 6080          | 69            |                                                                                     |     |  |
| W 75_40                                                                           | 40       | 40            | 22.5                          | 275            | 1.0            | 750           | 5630          | 68            | 12.5                         | 305            | 0.63                          | 750           | 6200          | 63            |                                                                                     |     |  |
| W 75_50                                                                           | 50       | 36            | 18.0                          | 235            | 0.70           | 750           | 6200          | 63            | 10.0                         | 260            | 0.47                          | 750           | 6200          | 58            |                                                                                     |     |  |
| W 75_60                                                                           | 60       | 33            | 15.0                          | 215            | 0.56           | 750           | 6200          | 60            | 8.3                          | 235            | 0.37                          | 750           | 6200          | 55            |                                                                                     |     |  |
| W 75_80                                                                           | 80       | 28            | 11.3                          | 195            | 0.43           | 750           | 6200          | 54            | 6.3                          | 215            | 0.29                          | 750           | 6200          | 49            |                                                                                     |     |  |
| W 75_100                                                                          | 100      | 25            | 9.0                           | 160            | 0.30           | 750           | 6200          | 50            | 5.0                          | 180            | 0.21                          | 750           | 6200          | 44            |                                                                                     |     |  |

420 Nm

|  |           | i   | $\eta_s$<br>% | $n_2$<br>min <sup>-1</sup> | $M_{n2}$<br>Nm               | $P_{n1}$<br>kW                | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% | $n_2$<br>min <sup>-1</sup>   | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% |  |
|-------------------------------------------------------------------------------------|-----------|-----|---------------|----------------------------|------------------------------|-------------------------------|---------------|---------------|---------------|------------------------------|----------------|----------------|---------------|---------------|---------------|---------------------------------------------------------------------------------------|
| $n_1 = 2800 \text{ min}^{-1}$                                                       |           |     |               |                            |                              | $n_1 = 1400 \text{ min}^{-1}$ |               |               |               |                              |                |                |               |               |               |                                                                                       |
|                                                                                     |           |     |               |                            |                              |                               |               |               |               |                              |                |                |               |               |               |                                                                                       |
| WR 75                                                                               | WR 75_21  | 21  | 70            | 133                        | 205                          | 3.3                           | 500           | 2030          | 88            | 67                           | 225            | 1.8            | 500           | 3060          | 86            | 179                                                                                   |
|                                                                                     | WR 75_30  | 30  | 66            | 93                         | 250                          | 2.8                           | 500           | 2640          | 86            | 47                           | 275            | 1.6            | 500           | 3610          | 84            |                                                                                       |
|                                                                                     | WR 75_45  | 45  | 59            | 62                         | 270                          | 2.1                           | 500           | 3380          | 83            | 31                           | 295            | 1.2            | 500           | 4530          | 80            |                                                                                       |
|                                                                                     | WR 75_60  | 60  | 55            | 47                         | 270                          | 1.6                           | 500           | 3980          | 80            | 23.3                         | 295            | 0.94           | 500           | 5280          | 77            |                                                                                       |
|                                                                                     | WR 75_75  | 75  | 51            | 37                         | 270                          | 1.4                           | 500           | 4480          | 77            | 18.7                         | 295            | 0.79           | 500           | 5890          | 73            |                                                                                       |
|                                                                                     | WR 75_90  | 90  | 44            | 31                         | 290                          | 1.3                           | 500           | 4780          | 74            | 15.6                         | 320            | 0.76           | 500           | 6200          | 69            |                                                                                       |
|                                                                                     | WR 75_120 | 120 | 39            | 23.3                       | 275                          | 1.0                           | 500           | 5540          | 68            | 11.7                         | 305            | 0.59           | 500           | 6200          | 63            |                                                                                       |
|                                                                                     | WR 75_150 | 150 | 35            | 18.7                       | 235                          | 0.73                          | 500           | 6200          | 63            | 9.3                          | 260            | 0.44           | 500           | 6200          | 58            |                                                                                       |
|                                                                                     | WR 75_180 | 180 | 32            | 15.6                       | 215                          | 0.58                          | 500           | 6200          | 60            | 7.8                          | 235            | 0.35           | 500           | 6200          | 55            |                                                                                       |
|                                                                                     | WR 75_240 | 240 | 27            | 11.7                       | 195                          | 0.44                          | 500           | 6200          | 54            | 5.8                          | 215            | 0.27           | 500           | 6200          | 49            |                                                                                       |
|                                                                                     | WR 75_300 | 300 | 24            | 9.3                        | 160                          | 0.31                          | 500           | 6200          | 50            | 4.7                          | 180            | 0.20           | 500           | 6200          | 44            |                                                                                       |
|                                                                                     |           |     |               |                            | $n_1 = 900 \text{ min}^{-1}$ |                               |               |               |               | $n_1 = 500 \text{ min}^{-1}$ |                |                |               |               |               |                                                                                       |
|                                                                                     | WR 75_21  | 21  | 70            | 43                         | 245                          | 1.3                           | 500           | 3660          | 85            | 23.8                         | 270            | 0.82           | 500           | 4660          | 82            | 179                                                                                   |
|                                                                                     | WR 75_30  | 30  | 66            | 30                         | 330                          | 1.3                           | 500           | 4070          | 82            | 16.7                         | 370            | 0.81           | 500           | 5160          | 80            |                                                                                       |
|                                                                                     | WR 75_45  | 45  | 59            | 20.0                       | 350                          | 0.94                          | 500           | 5180          | 78            | 11.1                         | 400            | 0.62           | 500           | 6200          | 75            |                                                                                       |
|                                                                                     | WR 75_60  | 60  | 55            | 15.0                       | 330                          | 0.69                          | 500           | 6180          | 75            | 8.3                          | 370            | 0.45           | 500           | 6200          | 71            |                                                                                       |
|                                                                                     | WR 75_75  | 75  | 51            | 12.0                       | 330                          | 0.59                          | 500           | 6200          | 70            | 6.7                          | 350            | 0.37           | 500           | 6200          | 66            |                                                                                       |
|                                                                                     | WR 75_90  | 90  | 44            | 10.0                       | 370                          | 0.58                          | 500           | 6200          | 67            | 5.6                          | 420            | 0.39           | 500           | 6200          | 63            |                                                                                       |
|                                                                                     | WR 75_120 | 120 | 39            | 7.5                        | 330                          | 0.43                          | 500           | 6200          | 60            | 4.2                          | 380            | 0.30           | 500           | 6200          | 56            |                                                                                       |
| WR 75_150                                                                           | 150       | 35  | 6.0           | 310                        | 0.35                         | 500                           | 6200          | 55            | 3.3           | 350                          | 0.24           | 500            | 6200          | 51            |               |                                                                                       |
| WR 75_180                                                                           | 180       | 32  | 5.0           | 280                        | 0.29                         | 500                           | 6200          | 51            | 2.8           | 320                          | 0.20           | 500            | 6200          | 47            |               |                                                                                       |
| WR 75_240                                                                           | 240       | 27  | 3.8           | 220                        | 0.19                         | 500                           | 6200          | 45            | 2.1           | 280                          | 0.15           | 500            | 6200          | 41            |               |                                                                                       |
| WR 75_300                                                                           | 300       | 24  | 3.0           | 200                        | 0.15                         | 500                           | 6200          | 41            | 1.7           | 260                          | 0.12           | 500            | 6200          | 37            |               |                                                                                       |



## WR 75 - VF/W 44/75

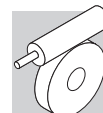
370 Nm

|  |               |                               |                |                              |               |               |               |                            |                               |                |                              |               |               |      |    |     |  |     |
|-----------------------------------------------------------------------------------|---------------|-------------------------------|----------------|------------------------------|---------------|---------------|---------------|----------------------------|-------------------------------|----------------|------------------------------|---------------|---------------|------|----|-----|-------------------------------------------------------------------------------------|-----|
| i                                                                                 | $\eta_s$<br>% | $n_2$<br>min <sup>-1</sup>    | $M_{n2}$<br>Nm | $P_{n1}$<br>kW               | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% | $n_2$<br>min <sup>-1</sup> | $M_{n2}$<br>Nm                | $P_{n1}$<br>kW | $R_{n1}$<br>N                | $R_{n2}$<br>N | $\eta_d$<br>% |      |    |     |                                                                                     |     |
|                                                                                   |               | $n_1 = 2800 \text{ min}^{-1}$ |                |                              |               |               |               |                            | $n_1 = 1400 \text{ min}^{-1}$ |                |                              |               |               |      |    |     |                                                                                     |     |
| WR 75_P90 B5                                                                      | WR 75_15      | 15                            | 66             | 187                          | 220           | 4.9           | —             | 1960                       | 89                            | 93             | 250                          | 2.9           | —             | 2640 | 86 | 179 |                                                                                     |     |
|                                                                                   | WR 75_22.5    | 22.5                          | 59             | 124                          | 240           | 3.7           | —             | 2530                       | 86                            | 62             | 270                          | 2.1           | —             | 3380 | 83 |     |                                                                                     |     |
|                                                                                   | WR 75_30      | 30                            | 55             | 93                           | 240           | 2.8           | —             | 3020                       | 84                            | 47             | 270                          | 1.7           | —             | 3980 | 80 |     |                                                                                     |     |
|                                                                                   | WR 75_37.5    | 37.5                          | 51             | 75                           | 240           | 2.3           | —             | 3410                       | 81                            | 37             | 270                          | 1.4           | —             | 4480 | 77 |     |                                                                                     |     |
|                                                                                   | WR 75_45      | 45                            | 44             | 62                           | 255           | 2.1           | —             | 3660                       | 79                            | 31             | 290                          | 1.3           | —             | 4780 | 74 |     |                                                                                     |     |
|                                                                                   | WR 75_60      | 60                            | 39             | 47                           | 240           | 1.6           | —             | 4290                       | 74                            | 23.3           | 275                          | 1.0           | —             | 5540 | 68 |     |                                                                                     |     |
|                                                                                   | WR 75_75      | 75                            | 35             | 37                           | 210           | 1.2           | —             | 4860                       | 70                            | 18.7           | 235                          | 0.74          | —             | 6200 | 63 |     |                                                                                     |     |
|                                                                                   | WR 75_90      | 90                            | 32             | 31                           | 190           | 0.93          | —             | 4460                       | 67                            | 15.6           | 215                          | 0.59          | —             | 6200 | 60 |     |                                                                                     |     |
|                                                                                   | WR 75_120     | 120                           | 27             | 23.3                         | 170           | 0.69          | —             | 4960                       | 61                            | 11.7           | 195                          | 0.44          | —             | 6200 | 54 |     |                                                                                     |     |
|                                                                                   | WR 75_150     | 150                           | 24             | 18.7                         | 145           | 0.49          | —             | 5150                       | 58                            | 9.3            | 160                          | 0.32          | —             | 6200 | 50 |     |                                                                                     |     |
|                                                                                   |               |                               |                | $n_1 = 900 \text{ min}^{-1}$ |               |               |               |                            |                               |                | $n_1 = 500 \text{ min}^{-1}$ |               |               |      |    |     |                                                                                     | 179 |
|                                                                                   | WR 75_15      | 15                            | 66             | 60                           | 275           | 2.1           | —             | 3150                       | 84                            | 33             | 330                          | 1.4           | —             | 3850 | 82 |     |                                                                                     |     |
|                                                                                   | WR 75_22.5    | 22.5                          | 59             | 40                           | 295           | 1.6           | —             | 4010                       | 80                            | 22.2           | 350                          | 1.0           | —             | 4920 | 78 |     |                                                                                     |     |
|                                                                                   | WR 75_30      | 30                            | 55             | 30                           | 295           | 1.2           | —             | 4710                       | 77                            | 16.7           | 330                          | 0.77          | —             | 5890 | 75 |     |                                                                                     |     |
|                                                                                   | WR 75_37.5    | 37.5                          | 51             | 24                           | 295           | 1.0           | —             | 5280                       | 73                            | 13.3           | 330                          | 0.66          | —             | 6200 | 70 |     |                                                                                     |     |
|                                                                                   | WR 75_45      | 45                            | 44             | 20                           | 320           | 0.98          | —             | 5610                       | 69                            | 11.1           | 370                          | 0.64          | —             | 6200 | 67 |     |                                                                                     |     |
|                                                                                   | WR 75_60      | 60                            | 39             | 15                           | 305           | 0.77          | —             | 6200                       | 63                            | 8.3            | 330                          | 0.48          | —             | 6200 | 60 |     |                                                                                     |     |
|                                                                                   | WR 75_75      | 75                            | 35             | 12                           | 260           | 0.57          | —             | 6200                       | 58                            | 6.7            | 310                          | 0.39          | —             | 6200 | 55 |     |                                                                                     |     |
|                                                                                   | WR 75_90      | 90                            | 32             | 10                           | 235           | 0.45          | —             | 6200                       | 55                            | 5.6            | 280                          | 0.32          | —             | 6200 | 52 |     |                                                                                     |     |
|                                                                                   | WR 75_120     | 120                           | 27             | 7.5                          | 215           | 0.35          | —             | 6200                       | 49                            | 4.2            | 220                          | 0.21          | —             | 6200 | 46 |     |                                                                                     |     |
|                                                                                   | WR 75_150     | 150                           | 24             | 6.0                          | 180           | 0.26          | —             | 6200                       | 44                            | 3.3            | 200                          | 0.17          | —             | 6200 | 41 |     |                                                                                     |     |

400 Nm

|  |                 | i    | $\eta_s$<br>% | $n_2$<br>min <sup>-1</sup>    | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% | $n_2$<br>min <sup>-1</sup>   | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% |  |
|-------------------------------------------------------------------------------------|-----------------|------|---------------|-------------------------------|----------------|----------------|---------------|---------------|---------------|------------------------------|----------------|----------------|---------------|---------------|---------------|---------------------------------------------------------------------------------------|
|                                                                                     |                 |      |               | $n_1 = 1400 \text{ min}^{-1}$ |                |                |               |               |               | $n_1 = 900 \text{ min}^{-1}$ |                |                |               |               |               |                                                                                       |
|                                                                                     |                 |      |               |                               |                |                |               |               |               |                              |                |                |               |               |               |                                                                                       |
| VF/W 44/75                                                                          | VF/W 44/75_250  | 250  | 34            | 5.6                           | 370            | 0.38           | 220           | 4560          | 57            | 3.6                          | 400            | 0.29           | 220           | 4660          | 52            | 180                                                                                   |
|                                                                                     | VF/W 44/75_300  | 300  | 30            | 4.7                           | 370            | 0.35           | 220           | 5160          | 51            | 3.0                          | 400            | 0.27           | 220           | 5150          | 46            |                                                                                       |
|                                                                                     | VF/W 44/75_400  | 400  | 26            | 3.5                           | 370            | 0.29           | 220           | 6200          | 46            | 2.3                          | 400            | 0.22           | 220           | 6200          | 42            |                                                                                       |
|                                                                                     | VF/W 44/75_525  | 525  | 25            | 2.7                           | 370            | 0.23           | 220           | 6200          | 44            | 1.7                          | 400            | 0.18           | 220           | 6200          | 41            |                                                                                       |
|                                                                                     | VF/W 44/75_700  | 700  | 24            | 2.0                           | 370            | 0.18           | 220           | 6200          | 42            | 1.3                          | 400            | 0.14           | 220           | 6200          | 39            |                                                                                       |
|                                                                                     | VF/W 44/75_920  | 920  | 21            | 1.5                           | 370            | 0.15           | —             | 6200          | 40            | 1.0                          | 400            | 0.11           | 60            | 6200          | 36            |                                                                                       |
|                                                                                     | VF/W 44/75_1200 | 1200 | 18            | 1.2                           | 370            | 0.12           | —             | 6200          | 37            | 0.75                         | 400            | 0.10           | 220           | 6200          | 31            |                                                                                       |
|                                                                                     | VF/W 44/75_1500 | 1500 | 17            | 0.93                          | 370            | 0.10           | 220           | 6200          | 37            | 0.60                         | 400            | 0.09           | 220           | 6200          | 29            |                                                                                       |
|                                                                                     | VF/W 44/75_2100 | 2100 | 14            | 0.67                          | 370            | 0.09           | 220           | 6200          | 30            | 0.43                         | 400            | 0.07           | 220           | 6200          | 24            |                                                                                       |
| VF/W 44/75_2800                                                                     | 2800            | 12   | 0.50          | 370                           | 0.07           | 220            | 6200          | 26            | 0.32          | 400                          | 0.06           | 220            | 6200          | 22            |               |                                                                                       |

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)

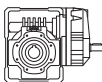


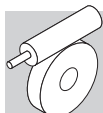
## W 86 - WR 86

440 Nm

|  | i                            | $\eta_s$<br>% | $n_2$                         | $M_{n2}$ | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ | $n_2$                         | $M_{n2}$                     | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |     |
|-----------------------------------------------------------------------------------|------------------------------|---------------|-------------------------------|----------|----------|----------|----------|----------|-------------------------------|------------------------------|----------|----------|----------|----------|-------------------------------------------------------------------------------------|-----|
|                                                                                   |                              |               | min <sup>-1</sup>             | Nm       | kW       | N        | N        | %        | min <sup>-1</sup>             | Nm                           | kW       | N        | N        | %        |                                                                                     |     |
|                                                                                   |                              |               | $n_1 = 2800 \text{ min}^{-1}$ |          |          |          |          |          | $n_1 = 1400 \text{ min}^{-1}$ |                              |          |          |          |          |                                                                                     |     |
| W 86                                                                              | W 86_7                       | 7             | 71                            | 400      | 225      | 10.4     | 850      | 2930     | 91                            | 200                          | 250      | 5.9      | 850      | 3920     | 89                                                                                  | 178 |
|                                                                                   | W 86_10                      | 10            | 67                            | 280      | 260      | 8.5      | 850      | 3490     | 90                            | 140                          | 290      | 4.8      | 850      | 4620     | 88                                                                                  |     |
|                                                                                   | W 86_15                      | 15            | 60                            | 187      | 295      | 6.6      | 850      | 4200     | 87                            | 93                           | 330      | 3.8      | 850      | 5510     | 85                                                                                  |     |
|                                                                                   | W 86_20                      | 20            | 60                            | 140      | 285      | 4.9      | 850      | 4900     | 86                            | 70                           | 320      | 2.8      | 850      | 6380     | 84                                                                                  |     |
|                                                                                   | W 86_23                      | 23            | 58                            | 122      | 285      | 4.3      | 850      | 5250     | 85                            | 61                           | 320      | 2.5      | 850      | 6800     | 82                                                                                  |     |
|                                                                                   | W 86_30                      | 30            | 45                            | 93       | 320      | 3.9      | 850      | 5740     | 81                            | 47                           | 370      | 2.4      | 850      | 7000     | 76                                                                                  |     |
|                                                                                   | W 86_40                      | 40            | 45                            | 70       | 295      | 2.7      | 850      | 6670     | 79                            | 35                           | 330      | 1.6      | 850      | 7000     | 75                                                                                  |     |
|                                                                                   | W 86_46                      | 46            | 43                            | 61       | 305      | 2.5      | 850      | 7000     | 77                            | 30                           | 340      | 1.5      | 850      | 7000     | 73                                                                                  |     |
|                                                                                   | W 86_56                      | 56            | 39                            | 50       | 265      | 1.8      | 850      | 7000     | 75                            | 25.0                         | 300      | 1.1      | 850      | 7000     | 70                                                                                  |     |
|                                                                                   | W 86_64                      | 64            | 37                            | 44       | 250      | 1.6      | 850      | 7000     | 73                            | 21.9                         | 280      | 0.94     | 850      | 7000     | 68                                                                                  |     |
|                                                                                   | W 86_80                      | 80            | 33                            | 35       | 225      | 1.2      | 850      | 7000     | 69                            | 17.5                         | 255      | 0.73     | 850      | 7000     | 64                                                                                  |     |
|                                                                                   | W 86_100                     | 100           | 29                            | 28.0     | 205      | 0.92     | 850      | 7000     | 65                            | 14.0                         | 230      | 0.57     | 850      | 7000     | 59                                                                                  |     |
|                                                                                   |                              |               |                               |          |          |          |          |          |                               |                              |          |          |          |          |                                                                                     |     |
|                                                                                   | $n_1 = 900 \text{ min}^{-1}$ |               |                               |          |          |          |          |          |                               | $n_1 = 500 \text{ min}^{-1}$ |          |          |          |          |                                                                                     |     |
|                                                                                   | W 86_7                       | 7             | 71                            | 129      | 270      | 4.1      | 850      | 4670     | 88                            | 71                           | 295      | 2.6      | 850      | 5890     | 85                                                                                  | 178 |
|                                                                                   | W 86_10                      | 10            | 67                            | 90       | 310      | 3.4      | 850      | 5500     | 86                            | 50                           | 345      | 2.2      | 850      | 6860     | 82                                                                                  |     |
|                                                                                   | W 86_15                      | 15            | 60                            | 60       | 355      | 2.7      | 850      | 6520     | 82                            | 33                           | 390      | 1.7      | 850      | 7000     | 78                                                                                  |     |
|                                                                                   | W 86_20                      | 20            | 60                            | 45       | 345      | 2.0      | 850      | 7000     | 81                            | 25.0                         | 380      | 1.3      | 850      | 7000     | 77                                                                                  |     |
|                                                                                   | W 86_23                      | 23            | 58                            | 39       | 345      | 1.8      | 850      | 7000     | 80                            | 21.7                         | 380      | 1.2      | 850      | 7000     | 75                                                                                  |     |
|                                                                                   | W 86_30                      | 30            | 45                            | 30       | 400      | 1.7      | 850      | 7000     | 73                            | 16.7                         | 440      | 1.1      | 850      | 7000     | 67                                                                                  |     |
|                                                                                   | W 86_40                      | 40            | 45                            | 22.5     | 355      | 1.2      | 850      | 7000     | 71                            | 12.5                         | 390      | 0.77     | 850      | 7000     | 66                                                                                  |     |
|                                                                                   | W 86_46                      | 46            | 43                            | 19.6     | 365      | 1.1      | 850      | 7000     | 69                            | 10.9                         | 405      | 0.73     | 850      | 7000     | 63                                                                                  |     |
|                                                                                   | W 86_56                      | 56            | 39                            | 16.1     | 325      | 0.83     | 850      | 7000     | 66                            | 8.9                          | 355      | 0.55     | 850      | 7000     | 60                                                                                  |     |
|                                                                                   | W 86_64                      | 64            | 37                            | 14.1     | 300      | 0.70     | 850      | 7000     | 63                            | 7.8                          | 330      | 0.47     | 850      | 7000     | 58                                                                                  |     |
|                                                                                   | W 86_80                      | 80            | 33                            | 11.3     | 275      | 0.55     | 850      | 7000     | 59                            | 6.3                          | 305      | 0.38     | 850      | 7000     | 53                                                                                  |     |
|                                                                                   | W 86_100                     | 100           | 29                            | 9.0      | 250      | 0.43     | 850      | 7000     | 55                            | 5.0                          | 275      | 0.29     | 850      | 7000     | 49                                                                                  |     |

550 Nm

|  |           | i   | $\eta_s$<br>% | $n_2$ | $M_{n2}$                     | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ | $n_2$ | $M_{n2}$                     | $P_{n1}$                      | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|-------------------------------------------------------------------------------------|-----------|-----|---------------|-------|------------------------------|----------|----------|----------|----------|-------|------------------------------|-------------------------------|----------|----------|----------|---------------------------------------------------------------------------------------|--|---|--|--|--|--|--|---|--|--|--|--|--|---|--|--|--|--|--|--|--|--|
| min <sup>-1</sup>                                                                   |           |     |               |       |                              | Nm       |          |          |          |       |                              | kW                            |          |          |          |                                                                                       |  | N |  |  |  |  |  | N |  |  |  |  |  | % |  |  |  |  |  |  |  |  |
| $n_1 = 2800 \text{ min}^{-1}$                                                       |           |     |               |       |                              |          |          |          |          |       |                              | $n_1 = 1400 \text{ min}^{-1}$ |          |          |          |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
| WR 86                                                                               | WR 86_21  | 21  | 70            | 133   | 270                          | 4.3      | 500      | 4590     | 88       | 67    | 295                          | 2.4                           | 500      | 6070     | 85       | 179                                                                                   |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_30  | 30  | 66            | 93    | 310                          | 3.5      | 500      | 5410     | 86       | 47    | 345                          | 2.1                           | 500      | 7000     | 82       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_45  | 45  | 59            | 62    | 355                          | 2.8      | 500      | 6420     | 82       | 31    | 390                          | 1.6                           | 500      | 7000     | 78       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_60  | 60  | 59            | 47    | 345                          | 2.1      | 500      | 7000     | 81       | 23.3  | 380                          | 1.2                           | 500      | 7000     | 77       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_69  | 69  | 57            | 41    | 345                          | 1.8      | 500      | 7000     | 80       | 20.3  | 380                          | 1.1                           | 500      | 7000     | 75       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_90  | 90  | 44            | 31    | 400                          | 1.8      | 500      | 7000     | 73       | 15.6  | 440                          | 1.1                           | 500      | 7000     | 67       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_120 | 120 | 44            | 23.3  | 355                          | 1.2      | 500      | 7000     | 71       | 11.7  | 390                          | 0.72                          | 500      | 7000     | 66       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_138 | 138 | 42            | 20.3  | 365                          | 1.1      | 500      | 7000     | 69       | 10.1  | 405                          | 0.68                          | 500      | 7000     | 63       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_168 | 168 | 38            | 16.7  | 325                          | 0.86     | 500      | 7000     | 66       | 8.3   | 355                          | 0.52                          | 500      | 7000     | 60       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_192 | 192 | 36            | 14.6  | 300                          | 0.73     | 500      | 7000     | 63       | 7.3   | 330                          | 0.43                          | 500      | 7000     | 58       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_240 | 240 | 32            | 11.7  | 275                          | 0.57     | 500      | 7000     | 59       | 5.8   | 305                          | 0.35                          | 500      | 7000     | 53       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_300 | 300 | 28            | 9.3   | 250                          | 0.44     | 500      | 7000     | 55       | 4.7   | 275                          | 0.27                          | 500      | 7000     | 49       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     |           |     |               |       |                              |          |          |          |          |       |                              |                               |          |          |          |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     |           |     |               |       | $n_1 = 900 \text{ min}^{-1}$ |          |          |          |          |       | $n_1 = 500 \text{ min}^{-1}$ |                               |          |          |          |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_21  | 21  | 70            | 43    | 325                          | 1.8      | 500      | 7000     | 83       | 23.8  | 355                          | 1.1                           | 500      | 7000     | 81       | 179                                                                                   |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_30  | 30  | 66            | 30    | 375                          | 1.5      | 500      | 7000     | 81       | 16.7  | 415                          | 0.93                          | 500      | 7000     | 78       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_45  | 45  | 59            | 20.0  | 450                          | 1.2      | 500      | 7000     | 76       | 11.1  | 500                          | 0.80                          | 500      | 7000     | 73       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_60  | 60  | 59            | 15.0  | 430                          | 0.90     | 500      | 7000     | 75       | 8.3   | 440                          | 0.53                          | 500      | 7000     | 72       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_69  | 69  | 57            | 13.0  | 390                          | 0.73     | 500      | 7000     | 73       | 7.2   | 400                          | 0.43                          | 500      | 7000     | 70       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_90  | 90  | 44            | 10.0  | 500                          | 0.82     | 500      | 7000     | 64       | 5.6   | 550                          | 0.53                          | 500      | 7000     | 60       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_120 | 120 | 44            | 7.5   | 440                          | 0.55     | 500      | 7000     | 63       | 4.2   | 470                          | 0.35                          | 500      | 7000     | 59       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_138 | 138 | 42            | 6.5   | 430                          | 0.48     | 500      | 7000     | 61       | 3.6   | 440                          | 0.30                          | 500      | 7000     | 56       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_168 | 168 | 38            | 5.4   | 390                          | 0.38     | 500      | 7000     | 57       | 3.0   | 410                          | 0.24                          | 500      | 7000     | 53       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_192 | 192 | 36            | 4.7   | 390                          | 0.35     | 500      | 7000     | 55       | 2.6   | 410                          | 0.22                          | 500      | 7000     | 50       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_240 | 240 | 32            | 3.8   | 310                          | 0.24     | 500      | 7000     | 50       | 2.1   | 320                          | 0.15                          | 500      | 7000     | 46       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                     | WR 86_300 | 300 | 28            | 3.0   | 310                          | 0.22     | 500      | 7000     | 45       | 1.7   | 320                          | 0.14                          | 500      | 7000     | 41       |                                                                                       |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |



## WR 86 - VF/W 44/86

500 Nm



i

$\eta_s$   
%

$n_2$   
min<sup>-1</sup>

$M_{n2}$   
Nm

$P_{n1}$   
kW

$R_{n1}$   
N

$R_{n2}$   
N

$\eta_d$   
%

$n_2$   
min<sup>-1</sup>

$M_{n2}$   
Nm

$P_{n1}$   
kW

$R_{n1}$   
N

$R_{n2}$   
N

$\eta_d$   
%



$n_1 = 2800 \text{ min}^{-1}$

$n_1 = 1400 \text{ min}^{-1}$

WR 86\_P90 B5

|            |      |    |      |     |      |   |      |    |      |     |      |   |      |    |
|------------|------|----|------|-----|------|---|------|----|------|-----|------|---|------|----|
| WR 86_15   | 15   | 66 | 187  | 275 | 6.1  | — | 4130 | 88 | 93   | 310 | 3.5  | — | 5410 | 86 |
| WR 86_22.5 | 22.5 | 59 | 124  | 315 | 4.8  | — | 4920 | 86 | 62   | 355 | 2.8  | — | 6420 | 82 |
| WR 86_30   | 30   | 59 | 93   | 305 | 3.5  | — | 5720 | 85 | 47   | 345 | 2.1  | — | 7000 | 81 |
| WR 86_34.5 | 34.5 | 57 | 81   | 305 | 3.1  | — | 6110 | 84 | 41   | 345 | 1.8  | — | 7000 | 80 |
| WR 86_45   | 45   | 44 | 62   | 350 | 3.0  | — | 6640 | 77 | 31   | 400 | 1.8  | — | 7000 | 73 |
| WR 86_60   | 60   | 44 | 47   | 315 | 2.0  | — | 7000 | 77 | 23.3 | 355 | 1.2  | — | 7000 | 71 |
| WR 86_69   | 69   | 42 | 41   | 325 | 1.8  | — | 7000 | 75 | 20.3 | 365 | 1.1  | — | 7000 | 69 |
| WR 86_84   | 84   | 38 | 33   | 285 | 1.4  | — | 7000 | 72 | 16.7 | 325 | 0.86 | — | 7000 | 66 |
| WR 86_96   | 96   | 36 | 29.2 | 265 | 1.2  | — | 7000 | 70 | 14.6 | 300 | 0.73 | — | 7000 | 63 |
| WR 86_120  | 120  | 32 | 23.3 | 240 | 0.88 | — | 7000 | 67 | 11.7 | 275 | 0.57 | — | 7000 | 59 |
| WR 86_150  | 150  | 28 | 18.7 | 220 | 0.69 | — | 7000 | 62 | 9.3  | 250 | 0.44 | — | 7000 | 55 |

179

$n_1 = 900 \text{ min}^{-1}$

$n_1 = 500 \text{ min}^{-1}$

|            |      |    |      |     |      |   |      |    |      |     |      |   |      |    |
|------------|------|----|------|-----|------|---|------|----|------|-----|------|---|------|----|
| WR 86_15   | 15   | 66 | 60   | 345 | 2.6  | — | 6330 | 82 | 33   | 375 | 1.6  | — | 7000 | 81 |
| WR 86_22.5 | 22.5 | 59 | 40   | 390 | 2.1  | — | 7000 | 78 | 22.2 | 450 | 1.4  | — | 7000 | 76 |
| WR 86_30   | 30   | 59 | 30   | 380 | 1.6  | — | 7000 | 77 | 16.7 | 430 | 1.0  | — | 7000 | 75 |
| WR 86_34.5 | 34.5 | 57 | 26.1 | 380 | 1.4  | — | 7000 | 75 | 14.5 | 390 | 0.81 | — | 7000 | 73 |
| WR 86_45   | 45   | 44 | 20.0 | 440 | 1.4  | — | 7000 | 67 | 11.1 | 500 | 0.91 | — | 7000 | 64 |
| WR 86_60   | 60   | 44 | 15.0 | 390 | 0.93 | — | 7000 | 66 | 8.3  | 440 | 0.61 | — | 7000 | 63 |
| WR 86_69   | 69   | 42 | 13.0 | 405 | 0.88 | — | 7000 | 63 | 7.2  | 430 | 0.53 | — | 7000 | 61 |
| WR 86_84   | 84   | 38 | 10.7 | 355 | 0.66 | — | 7000 | 60 | 6.0  | 390 | 0.43 | — | 7000 | 57 |
| WR 86_96   | 96   | 36 | 9.4  | 330 | 0.56 | — | 7000 | 58 | 5.2  | 390 | 0.39 | — | 7000 | 55 |
| WR 86_120  | 120  | 32 | 7.5  | 305 | 0.45 | — | 7000 | 53 | 4.2  | 310 | 0.27 | — | 7000 | 50 |
| WR 86_150  | 150  | 28 | 6.0  | 275 | 0.35 | — | 7000 | 49 | 3.3  | 310 | 0.24 | — | 7000 | 46 |

179

550 Nm



i

$\eta_s$   
%

$n_2$   
min<sup>-1</sup>

$M_{n2}$   
Nm

$P_{n1}$   
kW

$R_{n1}$   
N

$R_{n2}$   
N

$\eta_d$   
%

$n_2$   
min<sup>-1</sup>

$M_{n2}$   
Nm

$P_{n1}$   
kW

$R_{n1}$   
N

$R_{n2}$   
N

$\eta_d$   
%



$n_1 = 1400 \text{ min}^{-1}$

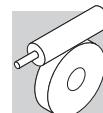
$n_1 = 900 \text{ min}^{-1}$

VF/W 44/86

|                 |      |    |      |     |      |     |      |    |      |     |      |     |      |    |
|-----------------|------|----|------|-----|------|-----|------|----|------|-----|------|-----|------|----|
| VF/W 44/86_230  | 230  | 38 | 6.1  | 500 | 0.59 | 220 | 7000 | 54 | 3.9  | 550 | 0.43 | 220 | 7000 | 53 |
| VF/W 44/86_300  | 300  | 30 | 4.7  | 500 | 0.54 | 220 | 7000 | 45 | 3.0  | 550 | 0.41 | 220 | 7000 | 42 |
| VF/W 44/86_400  | 400  | 30 | 3.5  | 500 | 0.45 | 220 | 7000 | 41 | 2.3  | 550 | 0.32 | 220 | 7000 | 41 |
| VF/W 44/86_525  | 525  | 25 | 2.7  | 500 | 0.33 | 220 | 7000 | 42 | 1.7  | 550 | 0.25 | 220 | 7000 | 39 |
| VF/W 44/86_700  | 700  | 25 | 2.0  | 500 | 0.27 | 220 | 7000 | 39 | 1.3  | 550 | 0.20 | 220 | 7000 | 37 |
| VF/W 44/86_920  | 920  | 22 | 1.5  | 500 | 0.20 | 220 | 7000 | 40 | 1.0  | 550 | 0.15 | —   | 7000 | 37 |
| VF/W 44/86_1380 | 1380 | 17 | 1.0  | 500 | 0.17 | 220 | 7000 | 32 | 0.65 | 550 | 0.13 | —   | 7000 | 28 |
| VF/W 44/86_1840 | 1840 | 17 | 0.76 | 500 | 0.13 | 220 | 7000 | 30 | 0.49 | 550 | 0.10 | —   | 7000 | 28 |
| VF/W 44/86_2116 | 2116 | 16 | 0.66 | 500 | 0.12 | 220 | 7000 | 28 | 0.43 | 550 | 0.09 | 220 | 7000 | 28 |
| VF/W 44/86_2760 | 2760 | 14 | 0.51 | 500 | 0.11 | —   | 7000 | 24 | 0.33 | 550 | 0.08 | 220 | 7000 | 24 |

180

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)

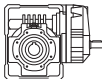


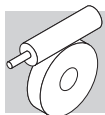
## W 110 - WR 110

830 Nm

|  | i         | $\eta_s$<br>% | $n_2$                         | $M_{n2}$                     | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ | $n_2$                         | $M_{n2}$                     | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |     |
|-----------------------------------------------------------------------------------|-----------|---------------|-------------------------------|------------------------------|----------|----------|----------|----------|-------------------------------|------------------------------|----------|----------|----------|----------|-------------------------------------------------------------------------------------|-----|
|                                                                                   |           |               | min <sup>-1</sup>             | Nm                           | kW       | N        | N        | %        | min <sup>-1</sup>             | Nm                           | kW       | N        | N        | %        |                                                                                     |     |
|                                                                                   |           |               | $n_1 = 2800 \text{ min}^{-1}$ |                              |          |          |          |          | $n_1 = 1400 \text{ min}^{-1}$ |                              |          |          |          |          |                                                                                     |     |
| W 110                                                                             | W 110_7   | 7             | 71                            | 400                          | 445      | 20.7     | 1200     | 3710     | 90                            | 200                          | 500      | 11.8     | 1200     | 5020     | 89                                                                                  | 178 |
|                                                                                   | W 110_10  | 10            | 67                            | 280                          | 490      | 16.1     | 1200     | 4650     | 89                            | 140                          | 550      | 9.3      | 1200     | 6190     | 87                                                                                  |     |
|                                                                                   | W 110_15  | 15            | 60                            | 187                          | 535      | 12.0     | 1200     | 5770     | 87                            | 93                           | 600      | 7.0      | 1200     | 7590     | 84                                                                                  |     |
|                                                                                   | W 110_20  | 20            | 61                            | 140                          | 510      | 8.7      | 1200     | 6790     | 86                            | 70                           | 570      | 5.0      | 1200     | 8000     | 84                                                                                  |     |
|                                                                                   | W 110_23  | 23            | 59                            | 122                          | 480      | 7.1      | 1200     | 7430     | 86                            | 61                           | 540      | 4.1      | 1200     | 8000     | 83                                                                                  |     |
|                                                                                   | W 110_30  | 30            | 45                            | 93                           | 625      | 7.5      | 1200     | 7780     | 81                            | 47                           | 700      | 4.4      | 1200     | 8000     | 77                                                                                  |     |
|                                                                                   | W 110_40  | 40            | 46                            | 70                           | 595      | 5.5      | 1200     | 8000     | 80                            | 35                           | 670      | 3.2      | 1200     | 8000     | 76                                                                                  |     |
|                                                                                   | W 110_46  | 46            | 44                            | 61                           | 535      | 4.3      | 1200     | 8000     | 79                            | 30                           | 600      | 2.6      | 1200     | 8000     | 74                                                                                  |     |
|                                                                                   | W 110_56  | 56            | 41                            | 50                           | 535      | 3.7      | 1200     | 8000     | 76                            | 25.0                         | 600      | 2.2      | 1200     | 8000     | 72                                                                                  |     |
|                                                                                   | W 110_64  | 64            | 38                            | 44                           | 470      | 2.9      | 1200     | 8000     | 74                            | 21.9                         | 530      | 1.7      | 1200     | 8000     | 70                                                                                  |     |
|                                                                                   | W 110_80  | 80            | 34                            | 35                           | 420      | 2.2      | 1200     | 8000     | 71                            | 17.5                         | 470      | 1.3      | 1200     | 8000     | 66                                                                                  |     |
|                                                                                   | W 110_100 | 100           | 30                            | 28.0                         | 410      | 1.8      | 1200     | 8000     | 67                            | 14.0                         | 460      | 1.1      | 1200     | 8000     | 62                                                                                  |     |
|                                                                                   |           |               |                               |                              |          |          |          |          |                               |                              |          |          |          |          |                                                                                     |     |
|                                                                                   |           |               |                               | $n_1 = 900 \text{ min}^{-1}$ |          |          |          |          |                               | $n_1 = 500 \text{ min}^{-1}$ |          |          |          |          |                                                                                     | 178 |
|                                                                                   | W 110_7   | 7             | 71                            | 129                          | 540      | 8.3      | 1200     | 6040     | 88                            | 71                           | 595      | 5.2      | 1200     | 7680     | 86                                                                                  |     |
|                                                                                   | W 110_10  | 10            | 67                            | 90                           | 590      | 6.5      | 1200     | 7410     | 86                            | 50                           | 655      | 4.1      | 1200     | 8000     | 84                                                                                  |     |
|                                                                                   | W 110_15  | 15            | 60                            | 60                           | 645      | 4.9      | 1200     | 8000     | 83                            | 33                           | 710      | 3.1      | 1200     | 8000     | 80                                                                                  |     |
|                                                                                   | W 110_20  | 20            | 61                            | 45                           | 615      | 3.5      | 1200     | 8000     | 82                            | 25.0                         | 675      | 2.2      | 1200     | 8000     | 79                                                                                  |     |
|                                                                                   | W 110_23  | 23            | 59                            | 39                           | 580      | 2.9      | 1200     | 8000     | 81                            | 21.7                         | 640      | 1.9      | 1200     | 8000     | 77                                                                                  |     |
|                                                                                   | W 110_30  | 30            | 45                            | 30                           | 755      | 3.2      | 1200     | 8000     | 74                            | 16.7                         | 830      | 2.1      | 1200     | 8000     | 70                                                                                  |     |
|                                                                                   | W 110_40  | 40            | 46                            | 22.5                         | 720      | 2.3      | 1200     | 8000     | 73                            | 12.5                         | 795      | 1.5      | 1200     | 8000     | 68                                                                                  |     |
|                                                                                   | W 110_46  | 46            | 44                            | 19.6                         | 645      | 1.9      | 1200     | 8000     | 71                            | 10.9                         | 710      | 1.2      | 1200     | 8000     | 66                                                                                  |     |
|                                                                                   | W 110_56  | 56            | 41                            | 16.1                         | 645      | 1.6      | 1200     | 8000     | 68                            | 8.9                          | 710      | 1.1      | 1200     | 8000     | 63                                                                                  |     |
|                                                                                   | W 110_64  | 64            | 38                            | 14.1                         | 570      | 1.3      | 1200     | 8000     | 65                            | 7.8                          | 630      | 0.86     | 1200     | 8000     | 60                                                                                  |     |
|                                                                                   | W 110_80  | 80            | 34                            | 11.3                         | 505      | 0.98     | 1200     | 8000     | 61                            | 6.3                          | 560      | 0.65     | 1200     | 8000     | 56                                                                                  |     |
|                                                                                   | W 110_100 | 100           | 30                            | 9.0                          | 495      | 0.82     | 1200     | 8000     | 57                            | 5.0                          | 545      | 0.56     | 1200     | 8000     | 51                                                                                  |     |

1000 Nm

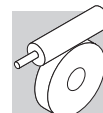
|  |            | i   | $\eta_s$<br>% | $n_2$                        | $M_{n2}$ | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$                      | $n_2$                        | $M_{n2}$ | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |
|-------------------------------------------------------------------------------------|------------|-----|---------------|------------------------------|----------|----------|----------|----------|-------------------------------|------------------------------|----------|----------|----------|----------|----------|---------------------------------------------------------------------------------------|
|                                                                                     |            |     |               | min <sup>-1</sup>            | Nm       | kW       | N        | N        | %                             | min <sup>-1</sup>            | Nm       | kW       | N        | N        | %        |                                                                                       |
| $n_1 = 2800 \text{ min}^{-1}$                                                       |            |     |               |                              |          |          |          |          | $n_1 = 1400 \text{ min}^{-1}$ |                              |          |          |          |          |          |                                                                                       |
| WR 110                                                                              | WR 110_21  | 21  | 70            | 133                          | 540      | 8.6      | 700      | 5930     | 88                            | 67                           | 595      | 4.8      | 700      | 7950     | 86       | 179                                                                                   |
|                                                                                     | WR 110_30  | 30  | 66            | 93                           | 590      | 6.7      | 700      | 7280     | 86                            | 47                           | 655      | 3.8      | 700      | 8000     | 84       |                                                                                       |
|                                                                                     | WR 110_45  | 45  | 59            | 62                           | 645      | 5.1      | 700      | 8000     | 83                            | 31                           | 710      | 2.9      | 700      | 8000     | 80       |                                                                                       |
|                                                                                     | WR 110_60  | 60  | 60            | 47                           | 615      | 3.7      | 700      | 8000     | 82                            | 23.3                         | 675      | 2.1      | 700      | 8000     | 79       |                                                                                       |
|                                                                                     | WR 110_69  | 69  | 58            | 41                           | 580      | 3.0      | 700      | 8000     | 81                            | 20.3                         | 640      | 1.8      | 700      | 8000     | 77       |                                                                                       |
|                                                                                     | WR 110_90  | 90  | 44            | 31                           | 755      | 3.3      | 700      | 8000     | 74                            | 15.6                         | 830      | 1.9      | 700      | 8000     | 70       |                                                                                       |
|                                                                                     | WR 110_120 | 120 | 45            | 23.3                         | 720      | 2.4      | 700      | 8000     | 73                            | 11.7                         | 795      | 1.4      | 700      | 8000     | 68       |                                                                                       |
|                                                                                     | WR 110_138 | 138 | 43            | 20.3                         | 645      | 1.9      | 700      | 8000     | 71                            | 10.1                         | 710      | 1.1      | 700      | 8000     | 66       |                                                                                       |
|                                                                                     | WR 110_168 | 168 | 40            | 16.7                         | 645      | 1.7      | 700      | 8000     | 68                            | 8.3                          | 710      | 0.98     | 700      | 8000     | 63       |                                                                                       |
|                                                                                     | WR 110_192 | 192 | 37            | 14.6                         | 570      | 1.3      | 700      | 8000     | 65                            | 7.3                          | 630      | 0.80     | 700      | 8000     | 60       |                                                                                       |
|                                                                                     | WR 110_240 | 240 | 33            | 11.7                         | 505      | 1.0      | 700      | 8000     | 61                            | 5.8                          | 560      | 0.61     | 700      | 8000     | 56       |                                                                                       |
|                                                                                     | WR 110_300 | 300 | 29            | 9.3                          | 495      | 0.85     | 700      | 8000     | 57                            | 4.7                          | 545      | 0.52     | 700      | 8000     | 51       |                                                                                       |
|                                                                                     |            |     |               |                              |          |          |          |          |                               |                              |          |          |          |          |          |                                                                                       |
|                                                                                     |            |     |               | $n_1 = 900 \text{ min}^{-1}$ |          |          |          |          |                               | $n_1 = 500 \text{ min}^{-1}$ |          |          |          |          |          | 179                                                                                   |
|                                                                                     | WR 110_21  | 21  | 70            | 43                           | 645      | 3.4      | 700      | 8000     | 84                            | 23.8                         | 715      | 2.2      | 700      | 8000     | 82       |                                                                                       |
|                                                                                     | WR 110_30  | 30  | 66            | 30                           | 710      | 2.8      | 700      | 8000     | 81                            | 16.7                         | 785      | 1.7      | 700      | 8000     | 79       |                                                                                       |
|                                                                                     | WR 110_45  | 45  | 59            | 20.0                         | 870      | 2.4      | 700      | 8000     | 77                            | 11.1                         | 950      | 1.5      | 700      | 8000     | 75       |                                                                                       |
|                                                                                     | WR 110_60  | 60  | 60            | 15.0                         | 800      | 1.6      | 700      | 8000     | 77                            | 8.3                          | 850      | 1.0      | 700      | 8000     | 74       |                                                                                       |
|                                                                                     | WR 110_69  | 69  | 58            | 13.0                         | 750      | 1.4      | 700      | 8000     | 75                            | 7.2                          | 820      | 0.86     | 700      | 8000     | 72       |                                                                                       |
|                                                                                     | WR 110_90  | 90  | 44            | 10.0                         | 900      | 1.4      | 700      | 8000     | 66                            | 5.6                          | 1000     | 0.94     | 700      | 8000     | 62       |                                                                                       |
|                                                                                     | WR 110_120 | 120 | 45            | 7.5                          | 870      | 1.1      | 700      | 8000     | 65                            | 4.2                          | 950      | 0.68     | 700      | 8000     | 61       |                                                                                       |
|                                                                                     | WR 110_138 | 138 | 43            | 6.5                          | 800      | 0.87     | 700      | 8000     | 63                            | 3.6                          | 900      | 0.58     | 700      | 8000     | 59       |                                                                                       |
|                                                                                     | WR 110_168 | 168 | 40            | 5.4                          | 775      | 0.72     | 700      | 8000     | 60                            | 3.0                          | 800      | 0.45     | 700      | 8000     | 55       |                                                                                       |
|                                                                                     | WR 110_192 | 192 | 37            | 4.7                          | 685      | 0.59     | 700      | 8000     | 57                            | 2.6                          | 720      | 0.37     | 700      | 8000     | 53       |                                                                                       |
|                                                                                     | WR 110_240 | 240 | 33            | 3.8                          | 590      | 0.44     | 700      | 8000     | 53                            | 2.1                          | 620      | 0.28     | 700      | 8000     | 48       |                                                                                       |
|                                                                                     | WR 110_300 | 300 | 29            | 3.0                          | 570      | 0.37     | 700      | 8000     | 48                            | 1.7                          | 600      | 0.24     | 700      | 8000     | 44       |                                                                                       |



## VF/W 49/110

1050 Nm

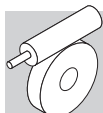
|  |                  | i    | $\eta_s$<br>% | $n_2$<br>min <sup>-1</sup> | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>%                | $n_2$<br>min <sup>-1</sup> | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% |  |
|-----------------------------------------------------------------------------------|------------------|------|---------------|----------------------------|----------------|----------------|---------------|---------------|------------------------------|----------------------------|----------------|----------------|---------------|---------------|---------------|-------------------------------------------------------------------------------------|
| $n_1 = 1400 \text{ min}^{-1}$                                                     |                  |      |               |                            |                |                |               |               | $n_1 = 900 \text{ min}^{-1}$ |                            |                |                |               |               |               |                                                                                     |
| VF/W 49/110                                                                       | VF/W 49/110_230  | 230  | 38            | 6.1                        | 1000           | 1.2            | 400           | 8000          | 52                           | 3.9                        | 1050           | 0.84           | 400           | 8000          | 51            | 180                                                                                 |
|                                                                                   | VF/W 49/110_300  | 300  | 29            | 4.7                        | 1000           | 1.0            | 400           | 8000          | 48                           | 3.0                        | 1050           | 0.70           | 400           | 8000          | 47            |                                                                                     |
|                                                                                   | VF/W 49/110_400  | 400  | 30            | 3.5                        | 1000           | 0.81           | 400           | 8000          | 45                           | 2.3                        | 1050           | 0.55           | 400           | 8000          | 45            |                                                                                     |
|                                                                                   | VF/W 49/110_540  | 540  | 25            | 2.6                        | 1000           | 0.66           | 400           | 8000          | 41                           | 1.7                        | 1050           | 0.48           | 400           | 8000          | 38            |                                                                                     |
|                                                                                   | VF/W 49/110_720  | 720  | 24            | 1.9                        | 1000           | 0.51           | 400           | 8000          | 40                           | 1.3                        | 1050           | 0.36           | 400           | 8000          | 38            |                                                                                     |
|                                                                                   | VF/W 49/110_1080 | 1080 | 18            | 1.3                        | 1000           | 0.44           | 400           | 8000          | 31                           | 0.83                       | 1050           | 0.28           | 400           | 8000          | 30            |                                                                                     |
|                                                                                   | VF/W 49/110_1350 | 1350 | 16            | 1.0                        | 1000           | 0.36           | 400           | 8000          | 30                           | 0.67                       | 1050           | 0.26           | 400           | 8000          | 28            |                                                                                     |
|                                                                                   | VF/W 49/110_1656 | 1656 | 17            | 0.85                       | 1000           | 0.30           | 400           | 8000          | 30                           | 0.54                       | 1050           | 0.20           | 400           | 8000          | 30            |                                                                                     |
|                                                                                   | VF/W 49/110_2070 | 2070 | 15            | 0.68                       | 1000           | 0.25           | 400           | 8000          | 28                           | 0.43                       | 1050           | 0.19           | 400           | 8000          | 25            |                                                                                     |
| VF/W 49/110_2800                                                                  | 2800             | 13   | 0.50          | 1000                       | 0.22           | 400            | 8000          | 24            | 0.32                         | 1050                       | 0.17           | 400            | 8000          | 21            |               |                                                                                     |



## VF 130 - VFR 130

1500 Nm

|  | i                            | $\eta_s$<br>% | $n_2$                         | $M_{n2}$ | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ | $n_2$                         | $M_{n2}$                     | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |     |
|-----------------------------------------------------------------------------------|------------------------------|---------------|-------------------------------|----------|----------|----------|----------|----------|-------------------------------|------------------------------|----------|----------|----------|----------|-------------------------------------------------------------------------------------|-----|
|                                                                                   |                              |               | min <sup>-1</sup>             | Nm       | kW       | N        | N        | %        | min <sup>-1</sup>             | Nm                           | kW       | N        | N        | %        |                                                                                     |     |
|                                                                                   |                              |               | $n_1 = 2800 \text{ min}^{-1}$ |          |          |          |          |          | $n_1 = 1400 \text{ min}^{-1}$ |                              |          |          |          |          |                                                                                     |     |
| VF 130                                                                            | VF 130_7                     | 7             | 71                            | 400      | 555      | 25       | 1500     | 4930     | 91                            | 200                          | 740      | 17.4     | 1500     | 5990     | 89                                                                                  | 178 |
|                                                                                   | VF 130_10                    | 10            | 67                            | 280      | 593      | 19.3     | 1500     | 6210     | 90                            | 140                          | 790      | 13.3     | 1500     | 7620     | 88                                                                                  |     |
|                                                                                   | VF 130_15                    | 15            | 63                            | 187      | 690      | 15.3     | 1500     | 7390     | 88                            | 93                           | 920      | 10.6     | 1500     | 9100     | 86                                                                                  |     |
|                                                                                   | VF 130_20                    | 20            | 59                            | 140      | 675      | 11.4     | 1500     | 8670     | 87                            | 70                           | 900      | 8.0      | 1500     | 10700    | 84                                                                                  |     |
|                                                                                   | VF 130_23                    | 23            | 57                            | 122      | 668      | 9.9      | 1500     | 9300     | 86                            | 61                           | 890      | 6.9      | 1500     | 11500    | 83                                                                                  |     |
|                                                                                   | VF 130_30                    | 30            | 49                            | 93       | 788      | 9.3      | 1040     | 10100    | 83                            | 47                           | 1050     | 6.6      | —        | 12500    | 79                                                                                  |     |
|                                                                                   | VF 130_40                    | 40            | 44                            | 70       | 825      | 7.6      | —        | 11400    | 80                            | 35                           | 1100     | 5.4      | —        | 12600    | 76                                                                                  |     |
|                                                                                   | VF 130_46                    | 46            | 45                            | 61       | 788      | 6.3      | 1290     | 12200    | 80                            | 30.0                         | 1050     | 4.5      | —        | 12600    | 76                                                                                  |     |
|                                                                                   | VF 130_56                    | 56            | 42                            | 50       | 720      | 4.8      | 1500     | 12600    | 78                            | 25.0                         | 960      | 3.4      | 940      | 12600    | 73                                                                                  |     |
|                                                                                   | VF 130_64                    | 64            | 39                            | 44       | 698      | 4.2      | 1500     | 12600    | 76                            | 21.9                         | 930      | 3.0      | 1220     | 12600    | 71                                                                                  |     |
|                                                                                   | VF 130_80                    | 80            | 35                            | 35       | 660      | 3.3      | 1500     | 12600    | 73                            | 17.5                         | 880      | 2.4      | 1500     | 12600    | 68                                                                                  |     |
|                                                                                   | VF 130_100                   | 100           | 31                            | 28       | 585      | 2.5      | 1500     | 12600    | 70                            | 14.0                         | 780      | 1.8      | 1500     | 12600    | 64                                                                                  |     |
|                                                                                   |                              |               |                               |          |          |          |          |          |                               |                              |          |          |          |          |                                                                                     |     |
|                                                                                   | $n_1 = 900 \text{ min}^{-1}$ |               |                               |          |          |          |          |          |                               | $n_1 = 500 \text{ min}^{-1}$ |          |          |          |          |                                                                                     |     |
|                                                                                   | VF 130_7                     | 7             | 71                            | 129      | 850      | 13.0     | 1500     | 6980     | 88                            | 71                           | 1000     | 8.8      | 1500     | 8670     | 86                                                                                  | 178 |
|                                                                                   | VF 130_10                    | 10            | 67                            | 90       | 900      | 9.9      | 1500     | 8900     | 87                            | 50                           | 1100     | 6.9      | 1500     | 10800    | 84                                                                                  |     |
|                                                                                   | VF 130_15                    | 15            | 63                            | 60       | 1080     | 8.1      | 1500     | 10490    | 84                            | 33                           | 1350     | 5.9      | 1500     | 12600    | 81                                                                                  |     |
|                                                                                   | VF 130_20                    | 20            | 59                            | 45       | 1050     | 6.1      | 1500     | 12400    | 82                            | 25.0                         | 1350     | 4.6      | 1500     | 13800    | 79                                                                                  |     |
|                                                                                   | VF 130_23                    | 23            | 57                            | 39       | 1050     | 5.4      | 1500     | 13200    | 81                            | 21.7                         | 1300     | 3.9      | 1500     | 13800    | 77                                                                                  |     |
|                                                                                   | VF 130_30                    | 30            | 49                            | 30.0     | 1250     | 5.2      | —        | 13200    | 77                            | 16.7                         | 1500     | 3.7      | —        | 13800    | 72                                                                                  |     |
|                                                                                   | VF 130_40                    | 40            | 44                            | 22.5     | 1200     | 3.9      | —        | 13200    | 73                            | 12.5                         | 1400     | 2.8      | —        | 13800    | 68                                                                                  |     |
|                                                                                   | VF 130_46                    | 46            | 45                            | 19.6     | 1150     | 3.3      | 490      | 13200    | 73                            | 10.9                         | 1350     | 2.3      | 1270     | 13800    | 68                                                                                  |     |
| VF 130_56                                                                         | 56                           | 42            | 16.1                          | 1080     | 2.7      | 1500     | 13200    | 70       | 8.9                           | 1200                         | 1.8      | 1500     | 13800    | 65       |                                                                                     |     |
| VF 130_64                                                                         | 64                           | 39            | 14.1                          | 1050     | 2.4      | 1500     | 13200    | 68       | 7.8                           | 1200                         | 1.6      | 1500     | 13800    | 62       |                                                                                     |     |
| VF 130_80                                                                         | 80                           | 35            | 11.3                          | 950      | 1.8      | 1500     | 13200    | 64       | 6.3                           | 1150                         | 1.3      | 1500     | 13800    | 58       |                                                                                     |     |
| VF 130_100                                                                        | 100                          | 31            | 9.0                           | 800      | 1.3      | 1500     | 13200    | 59       | 5.0                           | 900                          | 0.91     | 1500     | 13800    | 54       |                                                                                     |     |

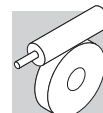


## W/VF 63/130

1850 Nm

|  |                  | i    | $\eta_s$<br>% | $n_2$<br>min <sup>-1</sup> | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>%                | $n_2$<br>min <sup>-1</sup> | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% |  |  |
|-----------------------------------------------------------------------------------|------------------|------|---------------|----------------------------|----------------|----------------|---------------|---------------|------------------------------|----------------------------|----------------|----------------|---------------|---------------|---------------|-------------------------------------------------------------------------------------|--|
| $n_1 = 1400 \text{ min}^{-1}$                                                     |                  |      |               |                            |                |                |               |               | $n_1 = 900 \text{ min}^{-1}$ |                            |                |                |               |               |               |                                                                                     |  |
|                                                                                   |                  |      |               |                            |                |                |               |               |                              |                            |                |                |               |               |               |                                                                                     |  |
| W/VF 63/130                                                                       | W/VF 63/130_280  | 280  | 31            | 5.0                        | 1800           | 1.9            | 480           | 13800         | 50                           | 3.2                        | 1850           | 1.3            | 480           | 13800         | 48            | 180                                                                                 |  |
|                                                                                   | W/VF 63/130_400  | 400  | 29            | 3.5                        | 1800           | 1.5            | 480           | 13800         | 44                           | 2.3                        | 1850           | 0.99           | 480           | 13800         | 44            |                                                                                     |  |
|                                                                                   | W/VF 63/130_600  | 600  | 26            | 2.3                        | 1800           | 1.1            | 480           | 13800         | 40                           | 1.5                        | 1850           | 0.73           | 480           | 13800         | 40            |                                                                                     |  |
|                                                                                   | W/VF 63/130_760  | 760  | 24            | 1.8                        | 1800           | 0.89           | 480           | 13800         | 39                           | 1.2                        | 1850           | 0.62           | 480           | 13800         | 37            |                                                                                     |  |
|                                                                                   | W/VF 63/130_960  | 960  | 23            | 1.5                        | 1800           | 0.74           | 480           | 13800         | 37                           | 0.94                       | 1850           | 0.52           | 480           | 13800         | 35            |                                                                                     |  |
|                                                                                   | W/VF 63/130_1200 | 1200 | 19            | 1.2                        | 1800           | 0.65           | —             | 13800         | 34                           | 0.75                       | 1850           | 0.45           | —             | 13800         | 32            |                                                                                     |  |
|                                                                                   | W/VF 63/130_1520 | 1520 | 18            | 0.92                       | 1800           | 0.55           | —             | 13800         | 32                           | 0.59                       | 1850           | 0.38           | —             | 13800         | 30            |                                                                                     |  |
|                                                                                   | W/VF 63/130_1800 | 1800 | 16            | 0.78                       | 1800           | 0.52           | —             | 13800         | 28                           | 0.50                       | 1850           | 0.37           | —             | 13800         | 26            |                                                                                     |  |
|                                                                                   | W/VF 63/130_2560 | 2560 | 14            | 0.55                       | 1800           | 0.45           | —             | 13800         | 23                           | 0.35                       | 1850           | 0.32           | —             | 13800         | 21            |                                                                                     |  |
| W/VF 63/130_3200                                                                  | 3200             | 12   | 0.44          | 1800                       | 0.49           | —              | 13800         | 17            | 0.28                         | 1850                       | 0.34           | 480            | 13800         | 16            |               |                                                                                     |  |

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)



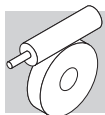
## VF 150 - VFR 150

2000 Nm

|  |            | i   | $\eta_s$<br>% | $n_2$                        | $M_{n2}$ | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ | $n_2$                         | $M_{n2}$          | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |    |    |   |   |   |  |  |  |
|-----------------------------------------------------------------------------------|------------|-----|---------------|------------------------------|----------|----------|----------|----------|----------|-------------------------------|-------------------|----------|----------|----------|----------|-------------------------------------------------------------------------------------|----|----|---|---|---|--|--|--|
| min <sup>-1</sup>                                                                 |            |     |               |                              |          | Nm       | kW       | N        | N        | %                             | min <sup>-1</sup> |          |          |          |          |                                                                                     | Nm | kW | N | N | % |  |  |  |
| $n_1 = 2800 \text{ min}^{-1}$                                                     |            |     |               |                              |          |          |          |          |          | $n_1 = 1400 \text{ min}^{-1}$ |                   |          |          |          |          |                                                                                     |    |    |   |   |   |  |  |  |
| VF 150                                                                            | VF 150_7   | 7   | 72            | 400                          | 750      | 35       | 2200     | 5010     | 91       | 200                           | 1000              | 24       | 2200     | 6040     | 90       | 178                                                                                 |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_10  | 10  | 68            | 280                          | 788      | 25       | 2200     | 6630     | 90       | 140                           | 1050              | 17.5     | 2200     | 8120     | 88       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_15  | 15  | 64            | 187                          | 863      | 19.0     | 2200     | 8110     | 89       | 93                            | 1150              | 13.1     | 2200     | 9990     | 87       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_20  | 20  | 59            | 140                          | 975      | 16.4     | 2200     | 9170     | 87       | 70                            | 1300              | 11.3     | 2200     | 11300    | 84       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_23  | 23  | 57            | 122                          | 953      | 14.1     | 2200     | 9940     | 86       | 61                            | 1270              | 9.8      | 2200     | 12300    | 83       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_30  | 30  | 48            | 93                           | 1028     | 12.1     | 2200     | 11100    | 83       | 47                            | 1370              | 8.5      | 2200     | 13700    | 80       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_40  | 40  | 44            | 70                           | 1155     | 10.5     | 2200     | 12300    | 81       | 35                            | 1540              | 7.4      | 830      | 14700    | 77       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_46  | 46  | 45            | 61                           | 1163     | 9.2      | 2200     | 13100    | 81       | 30.0                          | 1550              | 6.5      | 1400     | 14700    | 77       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_56  | 56  | 42            | 50                           | 1028     | 6.8      | 2200     | 14600    | 79       | 25.0                          | 1370              | 4.9      | 2200     | 14700    | 74       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_64  | 64  | 39            | 44                           | 998      | 5.9      | 2200     | 14700    | 77       | 21.9                          | 1330              | 4.2      | 2200     | 14700    | 72       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_80  | 80  | 35            | 35                           | 938      | 4.6      | 2200     | 14700    | 74       | 17.5                          | 1250              | 3.4      | 2200     | 14700    | 69       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_100 | 100 | 31            | 28                           | 863      | 3.6      | 2200     | 14700    | 71       | 14.0                          | 1150              | 2.6      | 2200     | 14700    | 65       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   |            |     |               |                              |          |          |          |          |          |                               |                   |          |          |          |          |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   |            |     |               | $n_1 = 900 \text{ min}^{-1}$ |          |          |          |          |          | $n_1 = 500 \text{ min}^{-1}$  |                   |          |          |          |          | 178                                                                                 |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_7   | 7   | 72            | 129                          | 1150     | 17.6     | 2200     | 7040     | 89       | 71                            | 1400              | 12.2     | 2200     | 8560     | 87       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_10  | 10  | 68            | 90                           | 1200     | 13.0     | 2200     | 9480     | 87       | 50                            | 1500              | 9.4      | 2200     | 11400    | 85       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_15  | 15  | 64            | 60                           | 1350     | 10.0     | 2200     | 11500    | 85       | 33                            | 1700              | 7.3      | 2200     | 13800    | 83       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_20  | 20  | 59            | 45                           | 1500     | 8.6      | 2200     | 13100    | 83       | 25.0                          | 1900              | 6.4      | 2200     | 15700    | 80       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_23  | 23  | 57            | 39                           | 1500     | 7.6      | 2200     | 14200    | 82       | 21.7                          | 1850              | 5.5      | 2200     | 16000    | 78       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_30  | 30  | 48            | 30.0                         | 1600     | 6.5      | 2200     | 15500    | 77       | 16.7                          | 1950              | 4.8      | 2200     | 16000    | 73       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_40  | 40  | 44            | 22.5                         | 1750     | 5.6      | 1150     | 15500    | 74       | 12.5                          | 2000              | 3.9      | 2200     | 16000    | 69       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_46  | 46  | 45            | 19.6                         | 1750     | 4.9      | 2100     | 15500    | 74       | 10.9                          | 2000              | 3.4      | 2200     | 16000    | 69       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_56  | 56  | 42            | 16.1                         | 1500     | 3.7      | 2200     | 15500    | 71       | 8.9                           | 1750              | 2.6      | 2200     | 16000    | 66       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_64  | 64  | 39            | 14.1                         | 1450     | 3.2      | 2200     | 15500    | 69       | 7.8                           | 1700              | 2.3      | 2200     | 16000    | 63       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_80  | 80  | 35            | 11.3                         | 1350     | 2.5      | 2200     | 15500    | 65       | 6.3                           | 1550              | 1.8      | 2200     | 16000    | 59       |                                                                                     |    |    |   |   |   |  |  |  |
|                                                                                   | VF 150_100 | 100 | 31            | 9.0                          | 1150     | 1.8      | 2200     | 15500    | 61       | 5.0                           | 1300              | 1.3      | 2200     | 16000    | 55       |                                                                                     |    |    |   |   |   |  |  |  |

2600 Nm

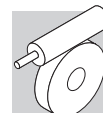
|  |             | i   | $\eta_s$<br>% | $n_2$                        | $M_{n2}$ | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$                      | $n_2$                        | $M_{n2}$ | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |  |
|-------------------------------------------------------------------------------------|-------------|-----|---------------|------------------------------|----------|----------|----------|----------|-------------------------------|------------------------------|----------|----------|----------|----------|----------|---------------------------------------------------------------------------------------|--|
|                                                                                     |             |     |               |                              |          |          |          |          |                               |                              |          |          |          |          |          |                                                                                       |  |
| $n_1 = 2800 \text{ min}^{-1}$                                                       |             |     |               |                              |          |          |          |          | $n_1 = 1400 \text{ min}^{-1}$ |                              |          |          |          |          |          |                                                                                       |  |
|                                                                                     |             |     |               | min <sup>-1</sup>            | Nm       | kW       | N        | N        | %                             | min <sup>-1</sup>            | Nm       | kW       | N        | N        | %        |                                                                                       |  |
| VFR 150                                                                             | VFR 150_45  | 45  | 63            | 62                           | 1350     | 10.6     | 1500     | 11600    | 84                            | 31                           | 1700     | 6.8      | 1500     | 14600    | 82       | 179                                                                                   |  |
|                                                                                     | VFR 150_60  | 60  | 58            | 47                           | 1500     | 9.0      | 1500     | 13100    | 82                            | 23.3                         | 1900     | 5.9      | 1500     | 16000    | 79       |                                                                                       |  |
|                                                                                     | VFR 150_69  | 69  | 56            | 41                           | 1500     | 7.9      | 1500     | 14100    | 81                            | 20.3                         | 1850     | 5.1      | 1500     | 16000    | 77       |                                                                                       |  |
|                                                                                     | VFR 150_90  | 90  | 47            | 31                           | 1600     | 6.9      | 1500     | 15500    | 76                            | 15.6                         | 1950     | 4.4      | 1500     | 16000    | 72       |                                                                                       |  |
|                                                                                     | VFR 150_120 | 120 | 43            | 23.3                         | 1750     | 5.9      | 1500     | 15500    | 73                            | 11.7                         | 2000     | 3.6      | 1500     | 16000    | 68       |                                                                                       |  |
|                                                                                     | VFR 150_138 | 138 | 44            | 20.3                         | 1750     | 5.1      | 1500     | 15500    | 73                            | 10.1                         | 2000     | 3.1      | 1500     | 16000    | 68       |                                                                                       |  |
|                                                                                     | VFR 150_168 | 168 | 41            | 16.7                         | 1500     | 3.8      | 1500     | 15500    | 70                            | 8.3                          | 1750     | 2.4      | 1500     | 16000    | 65       |                                                                                       |  |
|                                                                                     | VFR 150_192 | 192 | 38            | 14.6                         | 1450     | 3.3      | 1500     | 15500    | 68                            | 7.3                          | 1700     | 2.1      | 1500     | 16000    | 62       |                                                                                       |  |
|                                                                                     | VFR 150_240 | 240 | 34            | 11.7                         | 1350     | 2.6      | 1500     | 15500    | 64                            | 5.8                          | 1550     | 1.6      | 1500     | 16000    | 58       |                                                                                       |  |
|                                                                                     | VFR 150_300 | 300 | 30            | 9.3                          | 1150     | 1.9      | 1500     | 15500    | 60                            | 4.7                          | 1300     | 1.2      | 1500     | 16000    | 54       |                                                                                       |  |
|                                                                                     |             |     |               |                              |          |          |          |          |                               |                              |          |          |          |          |          |                                                                                       |  |
|                                                                                     |             |     |               | $n_1 = 900 \text{ min}^{-1}$ |          |          |          |          |                               | $n_1 = 500 \text{ min}^{-1}$ |          |          |          |          |          |                                                                                       |  |
|                                                                                     | VFR 150_45  | 45  | 63            | 20.0                         | 1950     | 5.2      | 1500     | 16000    | 79                            | 11.1                         | 2100     | 3.2      | 1500     | 16000    | 78       | 179                                                                                   |  |
|                                                                                     | VFR 150_60  | 60  | 58            | 15.0                         | 2100     | 4.4      | 1500     | 16000    | 76                            | 8.3                          | 2300     | 2.7      | 1500     | 16000    | 74       |                                                                                       |  |
|                                                                                     | VFR 150_69  | 69  | 56            | 13.0                         | 2050     | 3.8      | 1500     | 16000    | 74                            | 7.2                          | 2200     | 2.3      | 1500     | 16000    | 72       |                                                                                       |  |
|                                                                                     | VFR 150_90  | 90  | 47            | 10.0                         | 2200     | 3.4      | 1500     | 16000    | 69                            | 5.6                          | 2400     | 2.1      | 1500     | 16000    | 66       |                                                                                       |  |
|                                                                                     | VFR 150_120 | 120 | 43            | 7.5                          | 2300     | 2.8      | 1500     | 16000    | 64                            | 4.2                          | 2600     | 1.8      | 1500     | 16000    | 62       |                                                                                       |  |
|                                                                                     | VFR 150_138 | 138 | 44            | 6.5                          | 2200     | 2.4      | 1500     | 16000    | 64                            | 3.6                          | 2400     | 1.5      | 1500     | 16000    | 62       |                                                                                       |  |
|                                                                                     | VFR 150_168 | 168 | 41            | 5.4                          | 1950     | 1.8      | 1500     | 16000    | 61                            | 3.0                          | 2100     | 1.1      | 1500     | 16000    | 59       |                                                                                       |  |
| VFR 150_192                                                                         | 192         | 38  | 4.7           | 1900                         | 1.6      | 1500     | 16000    | 59       | 2.6                           | 2000                         | 1.0      | 1500     | 16000    | 56       |          |                                                                                       |  |
| VFR 150_240                                                                         | 240         | 34  | 3.8           | 1700                         | 1.2      | 1500     | 16000    | 54       | 2.1                           | 1800                         | 0.76     | 1500     | 16000    | 52       |          |                                                                                       |  |
| VFR 150_300                                                                         | 300         | 30  | 3.0           | 1350                         | 0.85     | 1500     | 16000    | 50       | 1.7                           | 1450                         | 0.54     | 1500     | 16000    | 47       |          |                                                                                       |  |



## W/VF 86/150

2700 Nm

|  |                  | i    | $\eta_s$<br>% | $n_2$<br>min <sup>-1</sup>    | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% | $n_2$<br>min <sup>-1</sup>   | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% |  |
|-----------------------------------------------------------------------------------|------------------|------|---------------|-------------------------------|----------------|----------------|---------------|---------------|---------------|------------------------------|----------------|----------------|---------------|---------------|---------------|-------------------------------------------------------------------------------------|
|                                                                                   |                  |      |               | $n_1 = 1400 \text{ min}^{-1}$ |                |                |               |               |               | $n_1 = 900 \text{ min}^{-1}$ |                |                |               |               |               |                                                                                     |
| W/VF 86/150                                                                       | W/VF 86/150_200  | 200  | 29            | 7.0                           | 2600           | 3.0            | 850           | 16000         | 64            | 4.5                          | 2700           | 2.1            | 850           | 16000         | 61            | 180                                                                                 |
|                                                                                   | W/VF 86/150_225  | 225  | 26            | 6.2                           | 2600           | 2.7            | 850           | 16000         | 63            | 4.0                          | 2700           | 1.9            | 850           | 16000         | 60            |                                                                                     |
|                                                                                   | W/VF 86/150_300  | 300  | 26            | 4.7                           | 2600           | 2.2            | 850           | 16000         | 58            | 3.0                          | 2700           | 1.5            | 850           | 16000         | 57            |                                                                                     |
|                                                                                   | W/VF 86/150_345  | 345  | 26            | 4.1                           | 2600           | 1.9            | 850           | 16000         | 58            | 2.6                          | 2700           | 1.3            | 850           | 16000         | 57            |                                                                                     |
|                                                                                   | W/VF 86/150_460  | 460  | 26            | 3.0                           | 2600           | 1.5            | 850           | 16000         | 55            | 2.0                          | 2700           | 1.0            | 850           | 16000         | 55            |                                                                                     |
|                                                                                   | W/VF 86/150_529  | 529  | 26            | 2.6                           | 2600           | 1.3            | 850           | 16000         | 55            | 1.7                          | 2700           | 0.93           | 850           | 16000         | 52            |                                                                                     |
|                                                                                   | W/VF 86/150_690  | 690  | 26            | 2.0                           | 2600           | 1.1            | 850           | 16000         | 50            | 1.3                          | 2700           | 0.78           | 850           | 16000         | 47            |                                                                                     |
|                                                                                   | W/VF 86/150_920  | 920  | 26            | 1.5                           | 2600           | 0.92           | 850           | 16000         | 45            | 0.98                         | 2700           | 0.64           | 850           | 16000         | 43            |                                                                                     |
|                                                                                   | W/VF 86/150_1380 | 1380 | 19            | 1.0                           | 2600           | 0.66           | 850           | 16000         | 42            | 0.65                         | 2700           | 0.46           | 850           | 16000         | 40            |                                                                                     |
|                                                                                   | W/VF 86/150_1840 | 1840 | 19            | 0.76                          | 2600           | 0.55           | 850           | 16000         | 38            | 0.49                         | 2700           | 0.38           | 850           | 16000         | 36            |                                                                                     |
| W/VF 86/150_2944                                                                  | 2944             | 16   | 0.48          | 2600                          | 0.48           | 850            | 16000         | 27            | 0.31          | 2700                         | 0.35           | 850            | 16000         | 25            |               |                                                                                     |



## VF 185 - VFR 185

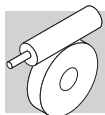
3600 Nm

|  |                              | i   | $\eta_s$<br>% | $n_2$                         | $M_{n2}$ | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ | $n_2$                         | $M_{n2}$ | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |  |
|-----------------------------------------------------------------------------------|------------------------------|-----|---------------|-------------------------------|----------|----------|----------|----------|----------|-------------------------------|----------|----------|----------|----------|----------|-------------------------------------------------------------------------------------|--|
|                                                                                   |                              |     |               | min <sup>-1</sup>             | Nm       | kW       | N        | N        | %        | min <sup>-1</sup>             | Nm       | kW       | N        | N        | %        |                                                                                     |  |
|                                                                                   |                              |     |               | $n_1 = 2800 \text{ min}^{-1}$ |          |          |          |          |          | $n_1 = 1400 \text{ min}^{-1}$ |          |          |          |          |          |                                                                                     |  |
| VF 185                                                                            | VF 185_7                     | 7   | 72            | 400                           | 1313     | 60       | 2800     | 4670     | 91       | 200                           | 1750     | 41       | 2800     | 5570     | 90       | 178                                                                                 |  |
|                                                                                   | VF 185_10                    | 10  | 68            | 280                           | 1365     | 44       | 2800     | 7390     | 90       | 140                           | 1820     | 30       | 2800     | 8960     | 89       |                                                                                     |  |
|                                                                                   | VF 185_15                    | 15  | 66            | 187                           | 1388     | 30       | 2800     | 9460     | 89       | 93                            | 1850     | 21       | 2800     | 11600    | 88       |                                                                                     |  |
|                                                                                   | VF 185_20                    | 20  | 59            | 140                           | 1703     | 28       | 2800     | 10500    | 88       | 70                            | 2270     | 19.6     | 2800     | 12900    | 85       |                                                                                     |  |
|                                                                                   | VF 185_30                    | 30  | 54            | 93                            | 1485     | 16.9     | 2800     | 13700    | 86       | 47                            | 1980     | 11.8     | 2800     | 16900    | 83       |                                                                                     |  |
|                                                                                   | VF 185_40                    | 40  | 44            | 70                            | 1973     | 17.6     | —        | 14500    | 82       | 35                            | 2630     | 12.4     | —        | 17900    | 78       |                                                                                     |  |
|                                                                                   | VF 185_50                    | 50  | 41            | 56                            | 1875     | 13.7     | —        | 16300    | 80       | 28.0                          | 2500     | 9.8      | —        | 18000    | 76       |                                                                                     |  |
|                                                                                   | VF 185_60                    | 60  | 39            | 47                            | 1703     | 10.7     | 2800     | 18000    | 78       | 23.3                          | 2270     | 7.6      | 770      | 18000    | 74       |                                                                                     |  |
|                                                                                   | VF 185_80                    | 80  | 33            | 35                            | 1590     | 7.8      | 2800     | 18000    | 75       | 17.5                          | 2120     | 5.6      | 1140     | 18000    | 69       |                                                                                     |  |
|                                                                                   | VF 185_100                   | 100 | 30            | 28.0                          | 1425     | 5.8      | 2800     | 18000    | 72       | 14.0                          | 1900     | 4.3      | 2800     | 18000    | 65       |                                                                                     |  |
|                                                                                   |                              |     |               |                               |          |          |          |          |          |                               |          |          |          |          |          |                                                                                     |  |
|                                                                                   | $n_1 = 900 \text{ min}^{-1}$ |     |               |                               |          |          |          |          |          | $n_1 = 500 \text{ min}^{-1}$  |          |          |          |          |          |                                                                                     |  |
|                                                                                   | VF 185_7                     | 7   | 72            | 129                           | 2000     | 30       | 2800     | 7120     | 89       | 71                            | 2450     | 21       | 2800     | 8730     | 88       | 178                                                                                 |  |
|                                                                                   | VF 185_10                    | 10  | 68            | 90                            | 2150     | 23       | 2800     | 10200    | 88       | 50                            | 2600     | 16.0     | 2800     | 12500    | 86       |                                                                                     |  |
|                                                                                   | VF 185_15                    | 15  | 66            | 60                            | 2250     | 16.4     | 2800     | 13100    | 86       | 33                            | 2800     | 11.8     | 2800     | 15700    | 84       |                                                                                     |  |
|                                                                                   | VF 185_20                    | 20  | 59            | 45                            | 2750     | 15.6     | 2800     | 14600    | 84       | 25.0                          | 3300     | 10.9     | 2800     | 17900    | 81       |                                                                                     |  |
|                                                                                   | VF 185_30                    | 30  | 54            | 30.0                          | 2400     | 9.4      | 2800     | 19000    | 81       | 16.7                          | 2800     | 6.5      | 2800     | 19500    | 77       |                                                                                     |  |
|                                                                                   | VF 185_40                    | 40  | 44            | 22.5                          | 3100     | 9.7      | —        | 19000    | 76       | 12.5                          | 3600     | 6.8      | —        | 19500    | 71       |                                                                                     |  |
|                                                                                   | VF 185_50                    | 50  | 41            | 18.0                          | 2900     | 7.6      | —        | 19000    | 73       | 10.0                          | 3300     | 5.2      | —        | 19500    | 68       |                                                                                     |  |
| VF 185_60                                                                         | 60                           | 39  | 15.0          | 2600                          | 5.8      | 700      | 19000    | 71       | 8.3      | 3000                          | 4.2      | 2800     | 19500    | 66       |          |                                                                                     |  |
| VF 185_80                                                                         | 80                           | 33  | 11.3          | 2400                          | 4.3      | 1770     | 19000    | 66       | 6.3      | 2800                          | 3.2      | 2800     | 19500    | 60       |          |                                                                                     |  |
| VF 185_100                                                                        | 100                          | 30  | 9.0           | 2000                          | 3.0      | 2800     | 19000    | 62       | 5.0      | 2300                          | 2.1      | 2800     | 19500    | 56       |          |                                                                                     |  |

4200 Nm

|  |             | i   | $\eta_S$<br>% | $n_2$                        | $M_{n2}$ | $P_{n1}$          | $R_{n1}$ | $R_{n2}$ | $\eta_d$                      | $n_2$                        | $M_{n2}$ | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |  |  |
|-------------------------------------------------------------------------------------|-------------|-----|---------------|------------------------------|----------|-------------------|----------|----------|-------------------------------|------------------------------|----------|----------|----------|----------|----------|---------------------------------------------------------------------------------------|--|--|
| min <sup>-1</sup>                                                                   |             |     |               |                              |          | min <sup>-1</sup> |          |          |                               |                              |          |          |          |          |          |                                                                                       |  |  |
| $n_1 = 2800 \text{ min}^{-1}$                                                       |             |     |               |                              |          |                   |          |          | $n_1 = 1400 \text{ min}^{-1}$ |                              |          |          |          |          |          |                                                                                       |  |  |
| VFR 185                                                                             | VFR 185_90  | 90  | 53            | 31                           | 2400     | 9.9               | 1700     | 19000    | 80                            | 15.6                         | 2800     | 6.0      | 1700     | 19500    | 76       | 179                                                                                   |  |  |
|                                                                                     | VFR 185_120 | 120 | 43            | 23.3                         | 3100     | 10.2              | 1700     | 19000    | 75                            | 11.7                         | 3600     | 6.3      | 1700     | 19500    | 70       |                                                                                       |  |  |
|                                                                                     | VFR 185_150 | 150 | 40            | 18.7                         | 2900     | 7.9               | 1700     | 19000    | 72                            | 9.3                          | 3300     | 4.8      | 1700     | 19500    | 67       |                                                                                       |  |  |
|                                                                                     | VFR 185_180 | 180 | 38            | 15.6                         | 2600     | 6.1               | 1700     | 19000    | 70                            | 7.8                          | 3000     | 3.8      | 1700     | 19500    | 65       |                                                                                       |  |  |
|                                                                                     | VFR 185_240 | 240 | 32            | 11.7                         | 2400     | 4.5               | 1700     | 19000    | 65                            | 5.8                          | 2800     | 2.9      | 1700     | 19500    | 59       |                                                                                       |  |  |
|                                                                                     | VFR 185_300 | 300 | 29            | 9.3                          | 2000     | 3.2               | 1700     | 19000    | 61                            | 4.7                          | 2300     | 2.0      | 1700     | 19500    | 55       |                                                                                       |  |  |
|                                                                                     |             |     |               | $n_1 = 900 \text{ min}^{-1}$ |          |                   |          |          |                               | $n_1 = 500 \text{ min}^{-1}$ |          |          |          |          |          |                                                                                       |  |  |
|                                                                                     | VFR 185_90  | 90  | 53            | 10.0                         | 3200     | 4.6               | 1700     | 19500    | 73                            | 5.6                          | 3500     | 2.9      | 1700     | 19500    | 71       | 179                                                                                   |  |  |
|                                                                                     | VFR 185_120 | 120 | 43            | 7.5                          | 3800     | 4.5               | 1700     | 19500    | 66                            | 4.2                          | 4200     | 2.9      | 1700     | 19500    | 63       |                                                                                       |  |  |
|                                                                                     | VFR 185_150 | 150 | 40            | 6.0                          | 3400     | 3.4               | 1700     | 19500    | 63                            | 3.3                          | 3700     | 2.2      | 1700     | 19500    | 60       |                                                                                       |  |  |
|                                                                                     | VFR 185_180 | 180 | 38            | 5.0                          | 3300     | 2.9               | 1700     | 19500    | 60                            | 2.8                          | 3600     | 1.8      | 1700     | 19500    | 57       |                                                                                       |  |  |
|                                                                                     | VFR 185_240 | 240 | 32            | 3.8                          | 2800     | 2.0               | 1700     | 19500    | 54                            | 2.1                          | 2900     | 1.2      | 1700     | 19500    | 53       |                                                                                       |  |  |
|                                                                                     | VFR 185_300 | 300 | 29            | 3.0                          | 2400     | 1.5               | 1700     | 19500    | 50                            | 1.7                          | 2500     | 0.91     | 1700     | 19500    | 48       |                                                                                       |  |  |

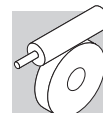
(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)



## W/VF 86/185

4400 Nm

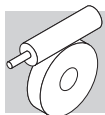
|  |                  | i    | $\eta_s$<br>% | $n_1 = 1400 \text{ min}^{-1}$ |                |                |               |               |               | $n_1 = 900 \text{ min}^{-1}$ |                |                |               |               |               |  |
|-----------------------------------------------------------------------------------|------------------|------|---------------|-------------------------------|----------------|----------------|---------------|---------------|---------------|------------------------------|----------------|----------------|---------------|---------------|---------------|-------------------------------------------------------------------------------------|
|                                                                                   |                  |      |               | $n_2$<br>min <sup>-1</sup>    | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% | $n_2$<br>min <sup>-1</sup>   | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% |                                                                                     |
| W/VF 86/185                                                                       | W/VF 86/185_280  | 280  | 31            | 5.0                           | 4200           | 4.2            | 850           | 19500         | 52            | 3.2                          | 4400           | 3.0            | 850           | 19500         | 49            | 180                                                                                 |
|                                                                                   | W/VF 86/185_400  | 400  | 29            | 3.5                           | 4200           | 3.2            | 850           | 19500         | 48            | 2.3                          | 4400           | 2.3            | 850           | 19500         | 45            |                                                                                     |
|                                                                                   | W/VF 86/185_600  | 600  | 26            | 2.3                           | 4200           | 2.3            | 850           | 19500         | 45            | 1.5                          | 4400           | 1.6            | 850           | 19500         | 43            |                                                                                     |
|                                                                                   | W/VF 86/185_800  | 800  | 26            | 1.8                           | 4200           | 1.8            | 850           | 19500         | 43            | 1.1                          | 4400           | 1.3            | 850           | 19500         | 40            |                                                                                     |
|                                                                                   | W/VF 86/185_920  | 920  | 26            | 1.5                           | 4200           | 1.6            | 850           | 19500         | 42            | 1.0                          | 4400           | 1.2            | 850           | 19500         | 38            |                                                                                     |
|                                                                                   | W/VF 86/185_1200 | 1200 | 20            | 1.2                           | 4200           | 1.5            | 850           | 19500         | 34            | 0.75                         | 4400           | 0.99           | 850           | 19500         | 35            |                                                                                     |
|                                                                                   | W/VF 86/185_1600 | 1600 | 20            | 0.88                          | 4200           | 1.1            | 850           | 19500         | 35            | 0.56                         | 4400           | 0.79           | 850           | 19500         | 33            |                                                                                     |
|                                                                                   | W/VF 86/185_1840 | 1840 | 19            | 0.76                          | 4200           | 0.98           | 850           | 19500         | 34            | 0.49                         | 4400           | 0.70           | 850           | 19500         | 32            |                                                                                     |
|                                                                                   | W/VF 86/185_2560 | 2560 | 16            | 0.55                          | 4200           | 0.83           | 850           | 19500         | 29            | 0.35                         | 4400           | 0.60           | 850           | 19500         | 27            |                                                                                     |
|                                                                                   | W/VF 86/185_3200 | 3200 | 15            | 0.44                          | 4200           | 0.80           | 850           | 19500         | 24            | 0.28                         | 4400           | 0.59           | 850           | 19500         | 22            |                                                                                     |



## VF 210 - VFR 210

5000 Nm

|  |            | i   | $\eta_s$<br>% | $n_2$ | $M_{n2}$ | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ | $n_2$ | $M_{n2}$ | $P_{n1}$                      | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|-----------------------------------------------------------------------------------|------------|-----|---------------|-------|----------|----------|----------|----------|----------|-------|----------|-------------------------------|----------|----------|----------|-------------------------------------------------------------------------------------|--|---|--|--|--|--|--|---|--|--|--|--|--|---|--|--|--|--|--|--|--|--|
| min <sup>-1</sup>                                                                 |            |     |               |       |          | Nm       |          |          |          |       |          | kW                            |          |          |          |                                                                                     |  | N |  |  |  |  |  | N |  |  |  |  |  | % |  |  |  |  |  |  |  |  |
| $n_1 = 2800 \text{ min}^{-1}$                                                     |            |     |               |       |          |          |          |          |          |       |          | $n_1 = 1400 \text{ min}^{-1}$ |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
| VF 210                                                                            | VF 210_7   | 7   | 71            | 400   | 1725     | 79       | 5300     | 14000    | 91       | 200   | 2300     | 54                            | 5300     | 16700    | 90       | 178                                                                                 |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   | VF 210_10  | 10  | 69            | 280   | 1988     | 65       | 5300     | 16300    | 90       | 140   | 2650     | 44                            | 5300     | 19500    | 89       |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   | VF 210_15  | 15  | 63            | 187   | 2138     | 47       | 5300     | 19700    | 89       | 93    | 2850     | 32                            | 5300     | 23700    | 88       |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   | VF 210_20  | 20  | 57            | 140   | 2325     | 39       | 4970     | 22000    | 87       | 70    | 3100     | 27                            | 1100     | 26600    | 85       |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   | VF 210_30  | 30  | 51            | 93    | 2288     | 26       | 5300     | 25900    | 85       | 47    | 3050     | 18.5                          | 1760     | 31500    | 83       |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   | VF 210_40  | 40  | 42            | 70    | 2625     | 23       | —        | 28300    | 81       | 35    | 3500     | 17.0                          | —        | 31500    | 78       |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   | VF 210_50  | 50  | 39            | 56    | 2475     | 18.4     | —        | 31000    | 79       | 28.0  | 3300     | 13.0                          | —        | 31500    | 76       |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   | VF 210_60  | 60  | 36            | 47    | 2363     | 15.0     | —        | 31500    | 77       | 23.3  | 3015     | 10.0                          | —        | 31500    | 73       |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   | VF 210_80  | 80  | 31            | 35    | 2175     | 10.9     | —        | 31500    | 73       | 17.5  | 2900     | 7.7                           | —        | 31500    | 69       |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   | VF 210_100 | 100 | 27            | 28    | 2025     | 8.5      | 950      | 31500    | 70       | 14.0  | 2700     | 6.0                           | —        | 31500    | 65       |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
|                                                                                   |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |
| </                                                                                |            |     |               |       |          |          |          |          |          |       |          |                               |          |          |          |                                                                                     |  |   |  |  |  |  |  |   |  |  |  |  |  |   |  |  |  |  |  |  |  |  |



## VF/VF 130/210

6500 Nm

|  |                    | i    | $\eta_s$<br>% | $n_2$<br>min <sup>-1</sup>    | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% | $n_2$<br>min <sup>-1</sup> | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N                | $R_{n2}$<br>N | $\eta_d$<br>% |  |  |  |  |
|-----------------------------------------------------------------------------------|--------------------|------|---------------|-------------------------------|----------------|----------------|---------------|---------------|---------------|----------------------------|----------------|----------------|------------------------------|---------------|---------------|-------------------------------------------------------------------------------------|--|--|--|
|                                                                                   |                    |      |               | $n_1 = 1400 \text{ min}^{-1}$ |                |                |               |               |               |                            |                |                | $n_1 = 900 \text{ min}^{-1}$ |               |               |                                                                                     |  |  |  |
|                                                                                   |                    |      |               |                               |                |                |               |               |               |                            |                |                |                              |               |               |                                                                                     |  |  |  |
| VF/VF 130/210                                                                     | VF/VF 130/210_280  | 280  | 30            | 5.0                           | 6300           | 6.3            | 1500          | 34500         | 52            | 3.2                        | 6500           | 4.4            | 1500                         | 34500         | 50            | 180                                                                                 |  |  |  |
|                                                                                   | VF/VF 130/210_400  | 400  | 28            | 3.5                           | 6300           | 4.6            | 1500          | 34500         | 50            | 2.3                        | 6500           | 3.2            | 1500                         | 34500         | 48            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/210_600  | 600  | 26            | 2.3                           | 6300           | 3.6            | 1500          | 34500         | 43            | 1.5                        | 6500           | 2.4            | 1500                         | 34500         | 43            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/210_800  | 800  | 25            | 1.8                           | 6300           | 2.8            | 1500          | 34500         | 41            | 1.1                        | 6500           | 2.0            | 1500                         | 34500         | 38            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/210_920  | 920  | 24            | 1.5                           | 6300           | 2.7            | 1500          | 34500         | 37            | 1.0                        | 6500           | 1.9            | 1500                         | 34500         | 35            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/210_1200 | 1200 | 21            | 1.2                           | 6300           | 2.2            | —             | 34500         | 35            | 0.75                       | 6500           | 1.5            | —                            | 34500         | 34            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/210_1600 | 1600 | 18            | 0.88                          | 6300           | 1.8            | —             | 34500         | 32            | 0.56                       | 6500           | 1.2            | —                            | 34500         | 32            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/210_1840 | 1840 | 19            | 0.76                          | 6300           | 1.7            | —             | 34500         | 30            | 0.49                       | 6500           | 1.2            | 490                          | 34500         | 28            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/210_2560 | 2560 | 16            | 0.55                          | 6300           | 1.5            | 1220          | 34500         | 24            | 0.35                       | 6500           | 1.0            | 1500                         | 34500         | 24            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/210_3200 | 3200 | 15            | 0.44                          | 6300           | 1.3            | 1500          | 34500         | 22            | 0.28                       | 6500           | 0.96           | 1500                         | 34500         | 20            |                                                                                     |  |  |  |

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)

## VF 250 - VFR 250

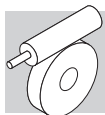
7100 Nm

|  |                              |                               |                |                |               |               |               |                            |                               |                |               |               |               |       |    |  |
|-----------------------------------------------------------------------------------|------------------------------|-------------------------------|----------------|----------------|---------------|---------------|---------------|----------------------------|-------------------------------|----------------|---------------|---------------|---------------|-------|----|-------------------------------------------------------------------------------------|
| i                                                                                 | $\eta_s$<br>%                | $n_2$<br>min <sup>-1</sup>    | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% | $n_2$<br>min <sup>-1</sup> | $M_{n2}$<br>Nm                | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% |       |    |                                                                                     |
|                                                                                   |                              | $n_1 = 2800 \text{ min}^{-1}$ |                |                |               |               |               |                            | $n_1 = 1400 \text{ min}^{-1}$ |                |               |               |               |       |    |                                                                                     |
| VF 250                                                                            | VF 250_7                     | 7                             | 71             | 400            | 2400          | 109           | 7000          | 18300                      | 92                            | 200            | 3200          | 75            | 7000          | 21900 | 91 | 178                                                                                 |
|                                                                                   | VF 250_10                    | 10                            | 69             | 280            | 2775          | 89            | 7000          | 21100                      | 91                            | 140            | 3700          | 61            | 7000          | 25300 | 90 |                                                                                     |
|                                                                                   | VF 250_15                    | 15                            | 64             | 187            | 3000          | 65            | 7000          | 25100                      | 90                            | 93             | 4000          | 45            | 7000          | 30300 | 88 |                                                                                     |
|                                                                                   | VF 250_20                    | 20                            | 59             | 140            | 3338          | 56            | 7000          | 28000                      | 88                            | 70             | 4450          | 38            | 7000          | 33900 | 86 |                                                                                     |
|                                                                                   | VF 250_30                    | 30                            | 53             | 93             | 3000          | 34            | 7000          | 33400                      | 86                            | 47             | 4000          | 23            | 7000          | 40600 | 84 |                                                                                     |
|                                                                                   | VF 250_40                    | 40                            | 41             | 70             | 3600          | 32            | 4680          | 36200                      | 82                            | 35             | 4800          | 22            | —             | 44000 | 79 |                                                                                     |
|                                                                                   | VF 250_50                    | 50                            | 36             | 56             | 3375          | 25            | 6370          | 39500                      | 79                            | 28.0           | 4500          | 17.0          | —             | 47000 | 76 |                                                                                     |
|                                                                                   | VF 250_60                    | 60                            | 38             | 47             | 3375          | 20.6          | 7000          | 42100                      | 80                            | 23.3           | 4500          | 15.0          | —             | 47000 | 76 |                                                                                     |
|                                                                                   | VF 250_80                    | 80                            | 32             | 35             | 2925          | 14.1          | 7000          | 47000                      | 76                            | 17.5           | 3900          | 10.0          | —             | 47000 | 71 |                                                                                     |
|                                                                                   | VF 250_100                   | 100                           | 29             | 28             | 2738          | 11.0          | 7000          | 47000                      | 73                            | 14.0           | 3650          | 7.8           | 3010          | 47000 | 68 |                                                                                     |
|                                                                                   |                              |                               |                |                |               |               |               |                            |                               |                |               |               |               |       |    | 178                                                                                 |
|                                                                                   | $n_1 = 900 \text{ min}^{-1}$ |                               |                |                |               |               |               |                            | $n_1 = 500 \text{ min}^{-1}$  |                |               |               |               |       |    |                                                                                     |
|                                                                                   | VF 250_7                     | 7                             | 71             | 129            | 4150          | 63            | 7000          | 23700                      | 90                            | 71             | 5200          | 44            | 7000          | 27600 | 88 |                                                                                     |
|                                                                                   | VF 250_10                    | 10                            | 69             | 90             | 4800          | 51            | 7000          | 27600                      | 89                            | 50             | 6000          | 36            | 7000          | 32300 | 87 |                                                                                     |
|                                                                                   | VF 250_15                    | 15                            | 64             | 60             | 5300          | 39            | 7000          | 33200                      | 87                            | 33             | 6400          | 27            | 7000          | 39500 | 85 |                                                                                     |
|                                                                                   | VF 250_20                    | 20                            | 59             | 45             | 5950          | 33            | 1640          | 37200                      | 85                            | 25.0           | 7100          | 24            | 1910          | 44400 | 82 |                                                                                     |
|                                                                                   | VF 250_30                    | 30                            | 53             | 30.0           | 5500          | 21            | 7000          | 44900                      | 81                            | 16.7           | 6000          | 14.7          | 7000          | 52000 | 79 |                                                                                     |
|                                                                                   | VF 250_40                    | 40                            | 41             | 22.5           | 6500          | 20.0          | —             | 48800                      | 76                            | 12.5           | 7000          | 13.6          | —             | 52000 | 72 |                                                                                     |
| VF 250_50                                                                         | 50                           | 36                            | 18.0           | 6200           | 16.2          | —             | 50000         | 73                         | 10.0                          | 6500           | 11.1          | —             | 52000         | 68    |    |                                                                                     |
| VF 250_60                                                                         | 60                           | 38                            | 15.0           | 5600           | 12.2          | —             | 50000         | 72                         | 8.3                           | 6300           | 8.6           | 4350          | 52000         | 68    |    |                                                                                     |
| VF 250_80                                                                         | 80                           | 32                            | 11.3           | 5200           | 9.3           | —             | 50000         | 67                         | 6.3                           | 5400           | 6.8           | 7000          | 52000         | 62    |    |                                                                                     |
| VF 250_100                                                                        | 100                          | 29                            | 9.0            | 4800           | 7.2           | 3010          | 50000         | 63                         | 5.0                           | 5000           | 5.3           | 4160          | 52000         | 58    |    |                                                                                     |

**9000 Nm**

|  |             | i   | $\eta_s$<br>% | $n_2$                        | $M_{n2}$ | $P_{n1}$          | $R_{n1}$ | $R_{n2}$ | $\eta_d$ | $n_2$                         | $M_{n2}$ | $P_{n1}$ | $R_{n1}$ | $R_{n2}$ | $\eta_d$ |  |  |  |  |  |  |
|-------------------------------------------------------------------------------------|-------------|-----|---------------|------------------------------|----------|-------------------|----------|----------|----------|-------------------------------|----------|----------|----------|----------|----------|---------------------------------------------------------------------------------------|--|--|--|--|--|
| min <sup>-1</sup>                                                                   |             |     |               |                              |          | min <sup>-1</sup> |          |          |          |                               |          |          |          |          |          |                                                                                       |  |  |  |  |  |
| $n_1 = 2800 \text{ min}^{-1}$                                                       |             |     |               |                              |          |                   |          |          |          | $n_1 = 1400 \text{ min}^{-1}$ |          |          |          |          |          |                                                                                       |  |  |  |  |  |
| VFR 250                                                                             | VFR 250_30  | 30  | 68            | 93                           | 4800     | 54                | 2800     | 27800    | 89       | 47                            | 6000     | 34       | 3500     | 34000    | 86       | 179                                                                                   |  |  |  |  |  |
|                                                                                     | VFR 250_45  | 45  | 63            | 62                           | 5300     | 41                | 2800     | 33300    | 87       | 31                            | 6400     | 25       | 3500     | 41300    | 84       |                                                                                       |  |  |  |  |  |
|                                                                                     | VFR 250_60  | 60  | 58            | 47                           | 5950     | 35                | 2800     | 37200    | 85       | 23.0                          | 7100     | 21       | 3500     | 46100    | 81       |                                                                                       |  |  |  |  |  |
|                                                                                     | VFR 250_90  | 90  | 52            | 31                           | 5500     | 22                | 2800     | 44700    | 81       | 15.6                          | 6000     | 12.6     | 3500     | 52000    | 78       |                                                                                       |  |  |  |  |  |
|                                                                                     | VFR 250_120 | 120 | 40            | 23.3                         | 6500     | 21.3              | 2800     | 48500    | 76       | 11.7                          | 7000     | 12.1     | 3500     | 52000    | 71       |                                                                                       |  |  |  |  |  |
|                                                                                     | VFR 250_150 | 150 | 35            | 18.7                         | 6200     | 16.9              | 2800     | 50000    | 73       | 9.3                           | 6500     | 9.5      | 3500     | 52000    | 67       |                                                                                       |  |  |  |  |  |
|                                                                                     | VFR 250_180 | 180 | 37            | 15.6                         | 5600     | 12.9              | 2800     | 50000    | 72       | 7.8                           | 6300     | 7.7      | 3500     | 52000    | 67       |                                                                                       |  |  |  |  |  |
|                                                                                     | VFR 250_240 | 240 | 31            | 11.7                         | 5200     | 9.7               | 2800     | 50000    | 67       | 5.8                           | 5400     | 5.4      | 3500     | 52000    | 61       |                                                                                       |  |  |  |  |  |
|                                                                                     | VFR 250_300 | 300 | 28            | 9.3                          | 4800     | 7.6               | 2800     | 50000    | 63       | 4.7                           | 5000     | 4.3      | 3500     | 52000    | 57       |                                                                                       |  |  |  |  |  |
|                                                                                     |             |     |               | $n_1 = 900 \text{ min}^{-1}$ |          |                   |          |          |          | $n_1 = 500 \text{ min}^{-1}$  |          |          |          |          |          |                                                                                       |  |  |  |  |  |
|                                                                                     | VFR 250_30  | 30  | 68            | 30.0                         | 6500     | 24                | 3700     | 39600    | 84       | 16.7                          | 7600     | 16.1     | 4200     | 47600    | 83       | 179                                                                                   |  |  |  |  |  |
|                                                                                     | VFR 250_45  | 45  | 63            | 20.0                         | 6800     | 17.5              | 3700     | 48000    | 82       | 11.1                          | 7900     | 11.6     | 3500     | 52000    | 80       |                                                                                       |  |  |  |  |  |
|                                                                                     | VFR 250_60  | 60  | 58            | 15.0                         | 7600     | 15.2              | 3700     | 52000    | 79       | 8.3                           | 8600     | 9.9      | 3500     | 52000    | 76       |                                                                                       |  |  |  |  |  |
|                                                                                     | VFR 250_90  | 90  | 52            | 10.0                         | 6500     | 9.3               | 3700     | 52000    | 74       | 5.6                           | 7400     | 6.1      | 3500     | 52000    | 71       |                                                                                       |  |  |  |  |  |
|                                                                                     | VFR 250_120 | 120 | 40            | 7.5                          | 7500     | 8.8               | 3700     | 52000    | 67       | 4.2                           | 9000     | 6.2      | 3500     | 52000    | 64       |                                                                                       |  |  |  |  |  |
|                                                                                     | VFR 250_150 | 150 | 35            | 6.0                          | 7000     | 7.0               | 3700     | 52000    | 63       | 3.3                           | 8600     | 5.1      | 3500     | 52000    | 59       |                                                                                       |  |  |  |  |  |
| VFR 250_180                                                                         | 180         | 37  | 5.0           | 6700                         | 5.7      | 3700              | 52000    | 62       | 2.8      | 7600                          | 3.8      | 3500     | 52000    | 59       |          |                                                                                       |  |  |  |  |  |
| VFR 250_240                                                                         | 240         | 31  | 3.8           | 5800                         | 4.1      | 3700              | 52000    | 56       | 2.1      | 6500                          | 2.7      | 3500     | 52000    | 52       |          |                                                                                       |  |  |  |  |  |
| VFR 250_300                                                                         | 300         | 28  | 3.0           | 5300                         | 3.2      | 3700              | 52000    | 52       | 1.7      | 6000                          | 2.2      | 3500     | 52000    | 48       |          |                                                                                       |  |  |  |  |  |

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)

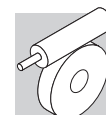


## VF/VF 130/250

9200 Nm

|  |                    | i    | $\eta_s$<br>% | $n_2$<br>min <sup>-1</sup>    | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N | $R_{n2}$<br>N | $\eta_d$<br>% | $n_2$<br>min <sup>-1</sup> | $M_{n2}$<br>Nm | $P_{n1}$<br>kW | $R_{n1}$<br>N                | $R_{n2}$<br>N | $\eta_d$<br>% |  |  |  |  |
|-----------------------------------------------------------------------------------|--------------------|------|---------------|-------------------------------|----------------|----------------|---------------|---------------|---------------|----------------------------|----------------|----------------|------------------------------|---------------|---------------|-------------------------------------------------------------------------------------|--|--|--|
|                                                                                   |                    |      |               | $n_1 = 1400 \text{ min}^{-1}$ |                |                |               |               |               |                            |                |                | $n_1 = 900 \text{ min}^{-1}$ |               |               |                                                                                     |  |  |  |
|                                                                                   |                    |      |               |                               |                |                |               |               |               |                            |                |                |                              |               |               |                                                                                     |  |  |  |
| VF/VF 130/250                                                                     | VF/VF 130/250_280  | 280  | 29            | 5.0                           | 9000           | 8.9            | 1500          | 52000         | 53            | 3.2                        | 9200           | 6.1            | 1500                         | 52000         | 51            | 180                                                                                 |  |  |  |
|                                                                                   | VF/VF 130/250_400  | 400  | 27            | 3.5                           | 9000           | 6.7            | 1500          | 52000         | 49            | 2.3                        | 9200           | 4.6            | 1500                         | 52000         | 47            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/250_600  | 600  | 26            | 2.3                           | 9000           | 5.0            | 1500          | 52000         | 44            | 1.5                        | 9200           | 3.4            | 1500                         | 52000         | 43            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/250_800  | 800  | 24            | 1.8                           | 9000           | 3.9            | 1500          | 52000         | 42            | 1.1                        | 9200           | 2.7            | 1500                         | 52000         | 40            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/250_920  | 920  | 23            | 1.5                           | 9000           | 3.9            | 1500          | 52000         | 37            | 0.98                       | 9200           | 2.7            | 1500                         | 52000         | 35            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/250_1200 | 1200 | 20            | 1.2                           | 9000           | 3.1            | —             | 52000         | 35            | 0.75                       | 9200           | 2.2            | —                            | 52000         | 33            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/250_1600 | 1600 | 18            | 0.88                          | 9000           | 2.6            | —             | 52000         | 32            | 0.56                       | 9200           | 1.8            | —                            | 52000         | 30            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/250_1840 | 1840 | 18            | 0.76                          | 9000           | 2.3            | —             | 52000         | 31            | 0.49                       | 9200           | 1.6            | 490                          | 52000         | 29            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/250_2560 | 2560 | 16            | 0.55                          | 9000           | 2.1            | 1500          | 52000         | 25            | 0.35                       | 9200           | 1.5            | 1500                         | 52000         | 23            |                                                                                     |  |  |  |
|                                                                                   | VF/VF 130/250_3200 | 3200 | 14            | 0.44                          | 9000           | 2.0            | 1500          | 52000         | 21            | 0.28                       | 9200           | 1.4            | 1500                         | 52000         | 19            |                                                                                     |  |  |  |

(-) Interpellare il ns. servizio tecnico comunicando i dati relativi al carico radiale (senso di rotazione, orientamento, posizione)

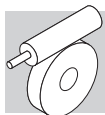


## 23 COMBINAZIONI DEI RAPPORTI NEI RIDUTTORI COMBINATI SERIE VF/VF, VF/W, W/VF

|               | Rapporti |     |     |     |     |      |      |      |      |      |      | i max |
|---------------|----------|-----|-----|-----|-----|------|------|------|------|------|------|-------|
| VF/VF 30/44   | 245      | 350 | 420 | 560 | 700 | 840  | 1120 | 1680 | 2100 |      |      | 6000  |
| VF 30         | 7        | 10  | 15  | 20  | 20  | 30   | 40   | 60   | 60   |      |      | 60    |
| VF 44         | 35       | 35  | 28  | 28  | 35  | 28   | 28   | 28   | 35   |      |      | 100   |
| VF/VF 30/49   | 240      | 315 | 420 | 540 | 720 | 900  | 1120 | 1440 | 2160 | 2700 |      | 6000  |
| VF 30         | 10       | 7   | 15  | 15  | 20  | 20   | 40   | 40   | 60   | 60   |      | 60    |
| VF 49         | 24       | 45  | 28  | 36  | 36  | 45   | 28   | 36   | 36   | 45   |      | 100   |
| VF/W 30/63    | 240      | 315 | 450 | 570 | 720 | 900  | 1200 | 1520 | 2280 | 2700 |      | 7000  |
| VF 30         | 10       | 7   | 15  | 15  | 30  | 30   | 40   | 40   | 60   | 60   |      | 70    |
| W 63          | 24       | 45  | 30  | 38  | 24  | 30   | 30   | 38   | 38   | 45   |      | 100   |
| VF/W 44/75    | 250      | 300 | 400 | 525 | 700 | 920  | 1200 | 1500 | 2100 | 2800 |      | 10000 |
| VF 44         | 10       | 10  | 10  | 35  | 35  | 46   | 60   | 60   | 70   | 70   |      | 100   |
| W 75          | 25       | 30  | 40  | 15  | 20  | 20   | 20   | 25   | 30   | 40   |      | 100   |
| VF/W 44/86    | 230      | 300 | 400 | 525 | 700 | 920  | 1380 | 1840 | 2116 | 2760 |      | 10000 |
| VF 44         | 10       | 10  | 10  | 35  | 35  | 46   | 46   | 46   | 46   | 60   |      | 100   |
| W 86          | 23       | 30  | 40  | 15  | 20  | 20   | 30   | 40   | 46   | 46   |      | 100   |
| VF/W 49/110   | 230      | 300 | 400 | 540 | 720 | 1080 | 1350 | 1656 | 2070 | 2800 |      | 10000 |
| VF 49         | 10       | 10  | 10  | 18  | 36  | 36   | 45   | 36   | 45   | 70   |      | 100   |
| W 110         | 23       | 30  | 40  | 30  | 20  | 30   | 30   | 46   | 46   | 40   |      | 100   |
| W/VF 63/130   | 280      | 400 | 600 | 760 | 960 | 1200 | 1520 | 1800 | 2560 | 3200 |      | 10000 |
| W 63          | 7        | 10  | 15  | 19  | 24  | 30   | 38   | 45   | 64   | 80   |      | 100   |
| VF 130        | 40       | 40  | 40  | 40  | 40  | 40   | 40   | 40   | 40   | 40   |      | 100   |
| W/VF 86/150   | 200      | 225 | 300 | 345 | 460 | 529  | 690  | 920  | 1380 | 1840 | 2944 | 10000 |
| W 86          | 10       | 15  | 15  | 15  | 20  | 23   | 23   | 23   | 46   | 46   | 64   | 100   |
| VF 150        | 20       | 15  | 20  | 23  | 23  | 23   | 30   | 40   | 30   | 40   | 46   | 100   |
| W/VF 86/185   | 280      | 400 | 600 | 800 | 920 | 1200 | 1600 | 1840 | 2560 | 3200 |      | 10000 |
| W 86          | 7        | 10  | 15  | 20  | 23  | 30   | 40   | 46   | 64   | 80   |      | 100   |
| VF 185        | 40       | 40  | 40  | 40  | 40  | 40   | 40   | 40   | 40   | 40   |      | 100   |
| VF/VF 130/210 | 280      | 400 | 600 | 800 | 920 | 1200 | 1600 | 1840 | 2560 | 3200 |      | 10000 |
| VF 130        | 7        | 10  | 15  | 20  | 23  | 30   | 40   | 46   | 64   | 80   |      | 100   |
| VF 210        | 40       | 40  | 40  | 40  | 40  | 40   | 40   | 40   | 40   | 40   |      | 100   |
| VF/VF 130/250 | 280      | 400 | 600 | 800 | 920 | 1200 | 1600 | 1840 | 2560 | 3200 |      | 10000 |
| VF 130        | 7        | 10  | 15  | 20  | 23  | 30   | 40   | 46   | 64   | 80   |      | 100   |
| VF 250        | 40       | 40  | 40  | 40  | 40  | 40   | 40   | 40   | 40   | 40   |      | 100   |

Le combinazioni dei rapporti rappresentati in tabella sono quelle preferenziali, e suggerite dal costruttore.

Il servizio tecnico di Bonfiglioli potrà eventualmente considerare le richieste di combinazioni di rapporti diverse da quelle proposte, purchè inferiori al valore massimo indicato in tabella.



## 24 PREDISPOSIZIONI MOTORE

### 24.1 Motori standard IEC

Nelle tabelle vengono riportati gli abbinamenti motore possibili in termini puramente geometrici.

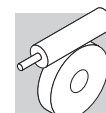
La scelta del motoriduttore deve essere effettuata seguendo le istruzioni specificate al paragrafo: “Selezione”, rispettando in particolare la condizione  $S \geq f_s$ .

|  IEC | VF 27  | VF 30  | VF 44   | VF 49   | W 63    | W 75    | W 86    | W 110   | VF 130   | VF 150   | VF 185   | VF 210  | VF 250  |
|---------------------------------------------------------------------------------------|--------|--------|---------|---------|---------|---------|---------|---------|----------|----------|----------|---------|---------|
| <b>P27</b> —                                                                          | 7...70 | —      | —       | —       | —       | —       | —       | —       | —        | —        | —        | —       | —       |
| <b>P56</b> $\frac{B5}{B14}$                                                           | —      | 7...70 | —       | —       | —       | —       | —       | —       | —        | —        | —        | —       | —       |
| <b>P63</b> $\frac{B5}{B14}$                                                           | —      | 7...60 | 7...100 | 7...100 | —       | —       | —       | —       | —        | —        | —        | —       | —       |
| <b>P71</b> $\frac{B5}{B14}$                                                           | —      | —      | 7...35  | 7...60  | 7...100 | 7...100 | 7...100 | —       | —        | —        | —        | —       | —       |
| <b>P80</b> $\frac{B5}{B14}$                                                           | —      | —      | —       | 7...28  | 7...100 | 7...100 | 7...100 | 7...100 | —        | —        | —        | —       | —       |
| <b>P90</b> $\frac{B5}{B14}$                                                           | —      | —      | —       | —       | 7...30  | 7...100 | 7...100 | 7...100 | 46...100 | —        | —        | —       | —       |
| <b>P100</b> $\frac{B5}{B14}$                                                          | —      | —      | —       | —       | —       | 7...100 | 7...100 | 7...100 | 7...80   | 23...100 | 50...100 | —       | —       |
| <b>P112</b> $\frac{B5}{B14}$                                                          | —      | —      | —       | —       | —       | 7...100 | 7...100 | 7...100 | 7...80   | 23...100 | 50...100 | —       | —       |
| <b>P132</b> B5                                                                        | —      | —      | —       | —       | —       | —       | —       | 7...100 | 7...40 # | 7...46   | 30...80  | 7...100 | 7...100 |
| <b>P160</b> B5                                                                        | —      | —      | —       | —       | —       | —       | —       | —       | —        | 7...20 # | 15...40  | 7...100 | 7...100 |
| <b>P180</b> B5                                                                        | —      | —      | —       | —       | —       | —       | —       | —       | —        | —        | 7...20 # | 7...100 | 7...100 |
| <b>P200</b> B5                                                                        | —      | —      | —       | —       | —       | —       | —       | —       | —        | —        | —        | 7...100 | 7...100 |
| <b>P225</b> B5                                                                        | —      | —      | —       | —       | —       | —       | —       | —       | —        | —        | —        | 7...100 | 7...100 |

|  IEC | VFR 44   | VFR 49   | WR 63    | WR 75    | WR 86    | WR 110   | VFR 130    | VFR 150                 | VFR 185                             | VFR 210    | VFR 250    |
|-----------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|------------|-------------------------|-------------------------------------|------------|------------|
| <b>S44</b> —                                                                            | 70...500 | —        | —        | —        | —        | —        | —          | —                       | —                                   | —          | —          |
| <b>P63</b> B5                                                                           | —        | 30...300 | 21...300 | 21...300 | 21...300 | —        | —          | —                       | —                                   | —          | —          |
| <b>P71</b> B5                                                                           | —        | —        | 21...300 | 21...300 | 21...300 | 21...300 | —          | —                       | —                                   | —          | —          |
| <b>P80</b> B5                                                                           | —        | —        | —        | 21...300 | 21...300 | 21...300 | 30...300   | —                       | —                                   | —          | —          |
| <b>P90</b> B5                                                                           | —        | —        | —        | 15...150 | 15...150 | 21...300 | 30...300   | 30...300<br>● (37.5;50) | 30...300<br>(37.5;50)<br>● (75;100) | —          | —          |
| <b>P100</b> B5                                                                          | —        | —        | —        | —        | —        | 21...300 | 30...300 # | 30...300<br>● (37.5;50) | 30...300<br>(37.5;50)<br>● (75;100) | 30...300   | 30...300   |
| <b>P112</b> B5                                                                          | —        | —        | —        | —        | —        | 21...300 | 30...300 # | 30...300<br>● (37.5;50) | 30...300<br>(37.5;50)<br>● (75;100) | 30...300   | 30...300   |
| <b>P132</b> B5                                                                          | —        | —        | —        | —        | —        | —        | —          | 25...50 #<br>● (30;45)  | 25...100 #<br>(30;45)<br>● (60;90)  | 30...300   | 30...300   |
| <b>P160</b> B5                                                                          | —        | —        | —        | —        | —        | —        | —          | —                       | —                                   | 30...300 # | 30...300 # |

■ Rapporto della precoppia elicoidale  $i = 1.5$

# Gli accoppiamenti motore-riduttore marcati con [#] sono realizzati tramite linguette di tipo ribassato, fornite insieme al riduttore stesso.



| IEC         |     | VF/VF<br>30/44 | VF/VF<br>30/49 | VF/W<br>30/63 | VF/W<br>44/75 | VF/W<br>44/86 | VF/W<br>49/110 | W/VF<br>63/130 | W/VF<br>86/150 | W/VF<br>86/185 | VF/VF<br>130/210 | VF/VF<br>130/250 |
|-------------|-----|----------------|----------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|------------------|------------------|
| <b>P56</b>  | B5  | —              | —              | 240...2700    | —             | —             | —              | —              | —              | —              | —                | —                |
|             | B14 | 245...2100     | 240...2700     | 240...2700    | —             | —             | —              | —              | —              | —              | —                | —                |
| <b>P63</b>  | B5  | —              | —              | 240...2700    | —             | —             | —              | —              | —              | —              | —                | —                |
|             | B14 | 245...2100     | 240...2700     | 240...2700    | 250...2800    | 230...2760    | 230...2800     | —              | —              | —              | —                | —                |
| <b>P71</b>  | B5  | —              | —              | —             | 250...700     | 230...700     | 230...2400     | 280...3200     | 200...2944     | 280...3200     | —                | —                |
|             | B14 | —              | —              | —             | —             | —             | —              | —              | —              | —              | —                | —                |
| <b>P80</b>  | B5  | —              | —              | —             | —             | —             | 230...540      | 280...3200     | 200...2944     | 280...3200     | —                | —                |
|             | B14 | —              | —              | —             | —             | —             | —              | —              | —              | —              | —                | —                |
| <b>P90</b>  | B5  | —              | —              | —             | —             | —             | —              | 280...1200     | 200...2944     | 280...3200     | 280...3200       | 280...3200       |
|             | B14 | —              | —              | —             | —             | —             | —              | —              | —              | —              | —                | —                |
| <b>P100</b> | B5  | —              | —              | —             | —             | —             | —              | —              | 200...2944     | 280...3200     | 280...3200       | 280...3200       |
|             | B14 | —              | —              | —             | —             | —             | —              | —              | —              | —              | —                | —                |
| <b>P112</b> | B5  | —              | —              | —             | —             | —             | —              | —              | 200...2944     | 280...3200     | 280...3200       | 280...3200       |
|             | B14 | —              | —              | —             | —             | —             | —              | —              | —              | —              | —                | —                |
| <b>P132</b> | B5  | —              | —              | —             | —             | —             | —              | —              | —              | —              | 280...1600 #     | 280...1600 #     |

# Gli accoppiamenti motore-riduttore marcati con [#] sono realizzati tramite linguette di tipo ribassato, fornite insieme al riduttore stesso.

## 24.2 Motori compatti

|              | M1        | M2        | M3        |
|--------------|-----------|-----------|-----------|
| <b>W 63</b>  | 7 ... 100 | 7 ... 100 | —         |
| <b>W 75</b>  | 7 ... 100 | 7 ... 100 | 7 ... 100 |
| <b>W 86</b>  | 7 ... 100 | 7 ... 100 | 7 ... 100 |
| <b>W 110</b> | —         | 7 ... 100 | 7 ... 100 |

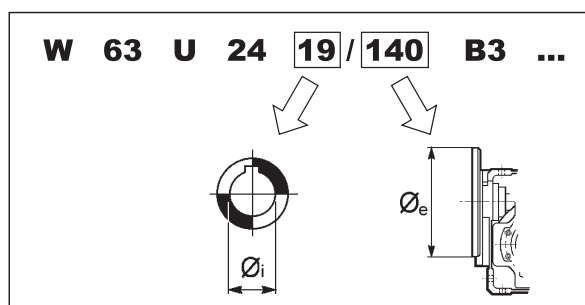
|                    | M1           | M2           | M3           |
|--------------------|--------------|--------------|--------------|
| <b>W/VF 63/130</b> | 280 ... 3200 | 280 ... 3200 | —            |
| <b>W/VF 86/150</b> | 200 ... 2944 | 200 ... 2944 | 200 ... 2944 |
| <b>W/VF 86/185</b> | 280 ... 3200 | 280 ... 3200 | 280 ... 3200 |

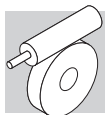
## 24.3 Massima potenza installabile sull'ingresso P\_

|      |    | IEC_  (IM B5) (IM B14) |      |      |      |      |      |      |      |      |      |      |
|------|----|-----------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|
|      |    | P63                                                                                                       | P71  | P80  | P90  | P100 | P112 | P132 | P160 | P180 | P200 | P225 |
|      |    | BN                                                                                                        |      |      |      |      |      |      |      |      |      | IEC  |
| [kW] | 2p | 0.37                                                                                                      | 0.75 | 1.5  | 2.2  | 4    | 4    | 9.2  | 18.5 | 22   | 30   | 45   |
|      | 4p | 0.25                                                                                                      | 0.55 | 1.1  | 1.85 | 3    | 4    | 9.2  | 15   | 22   | 30   | 47   |
|      | 6p | 0.12                                                                                                      | 0.37 | 0.75 | 1.1  | 1.85 | 2.2  | 5.5  | 11   | 15   | 18.5 | 30   |

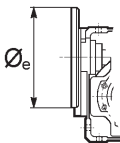
## 24.4 Motori non normalizzati

Per l'accoppiamento a motori elettrici non normalizzati, l'interfaccia motore dei riduttori serie VF e W può essere configurata con combinazioni albero veloce/flangia ibride, non corrispondenti cioè alla normativa IEC. La combinazione albero/flangia è esplicitata mediante i rispettivi diametri e qui di seguito esemplificata.





Gli abbinamenti albero/flangia disponibili, e i rapporti di trasmissione ai quali sono limitati, sono riportati nella tabella seguente.

|                                                                                   |    |  |             |             |             |             |             |             |
|-----------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
|  |    | 80                                                                                | 90          | 105         | 120         | 140         | 160         | 200         |
| VF 30                                                                             | 9  |                                                                                   | 7 ≤ i ≤ 70  | ⊖           |             | 7 ≤ i ≤ 70  | ⊖           | ⊖           |
|                                                                                   | 11 | 7 ≤ i ≤ 60                                                                        |             | ⊖           | 7 ≤ i ≤ 60  |             | ⊖           | ⊖           |
| VF 44                                                                             | HS | ⊖                                                                                 | 7 ≤ i ≤ 100 | 7 ≤ i ≤ 100 | ⊖           | 7 ≤ i ≤ 100 | 7 ≤ i ≤ 100 | ⊖           |
|                                                                                   | 11 | ⊖                                                                                 |             | 7 ≤ i ≤ 100 | ⊖           |             | 7 ≤ i ≤ 100 | ⊖           |
|                                                                                   | 14 | ⊖                                                                                 | 7 ≤ i ≤ 35  |             | ⊖           | 7 ≤ i ≤ 35  |             | ⊖           |
| VF 49                                                                             | HS | ⊖                                                                                 | 7 ≤ i ≤ 100 | 7 ≤ i ≤ 100 | 7 ≤ i ≤ 100 | 7 ≤ i ≤ 100 | 7 ≤ i ≤ 100 | 7 ≤ i ≤ 100 |
|                                                                                   | 11 | ⊖                                                                                 |             | 7 ≤ i ≤ 100 | 7 ≤ i ≤ 100 |             | 7 ≤ i ≤ 100 | 7 ≤ i ≤ 100 |
|                                                                                   | 14 | ⊖                                                                                 | 7 ≤ i ≤ 60  |             | 7 ≤ i ≤ 60  | 7 ≤ i ≤ 60  |             | 7 ≤ i ≤ 60  |
|                                                                                   | 19 | ⊖                                                                                 | 7 ≤ i ≤ 28  | 7 ≤ i ≤ 28  |             | 7 ≤ i ≤ 28  | 7 ≤ i ≤ 28  |             |
| W 63                                                                              | 19 | ⊖                                                                                 | ⊖           | ⊖           | ⊖           | 7 ≤ i ≤ 100 | ⊖           |             |
| W 75                                                                              | 14 | ⊖                                                                                 | ⊖           | ⊖           | ⊖           | ⊖           |             | 7 ≤ i ≤ 100 |
|                                                                                   | 19 | ⊖                                                                                 | ⊖           | ⊖           |             | 7 ≤ i ≤ 100 | 7 ≤ i ≤ 100 |             |
|                                                                                   | 24 | ⊖                                                                                 | ⊖           | ⊖           | 7 ≤ i ≤ 100 |             | 7 ≤ i ≤ 100 |             |
| W 86                                                                              | 14 | ⊖                                                                                 | ⊖           | ⊖           | ⊖           | ⊖           |             | 7 ≤ i ≤ 100 |
|                                                                                   | 19 | ⊖                                                                                 | ⊖           | ⊖           |             | 7 ≤ i ≤ 100 | 7 ≤ i ≤ 100 |             |
|                                                                                   | 24 | ⊖                                                                                 | ⊖           | ⊖           | 7 ≤ i ≤ 100 |             | 7 ≤ i ≤ 100 |             |
| W 110                                                                             | 19 | ⊖                                                                                 | ⊖           | ⊖           |             | 7 ≤ i ≤ 100 | ⊖           | ⊖           |
|                                                                                   | 24 | ⊖                                                                                 | ⊖           | ⊖           | 7 ≤ i ≤ 100 |             | ⊖           | ⊖           |

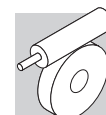
Abbinamenti standard

Alcuni abbinamenti ibridi albero/flangia sono eseguibili anche per riduttori VF di interasse 130 e superiore. In questo caso consultare il Servizio Tecnico di Bonfiglioli per la disponibilità.

Le configurazioni risultanti dalla tabella sopra riportata sono da intendersi possibili esclusivamente per quanto riguarda la compatibilità geometrica.

La compatibilità meccanica dell'insieme motore/riduttore dovrà essere ulteriormente verificata mediante l'uso delle consuete tabelle di selezione per potenza/velocità.

In particolare dovranno essere evitati gli abbinamenti motore che generano fattori di sicurezza  $S < 0,9$ .



## 25 MOMENTO D'INERZIA

Le tabelle tecniche seguenti indicano i valori del momento d'inerzia  $J_r$  [Kgm<sup>2</sup>] riferiti all'asse veloce del riduttore; per una migliore facilità di lettura riportiamo le definizioni dei simboli usati:

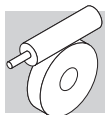
|  |                                                                                                                                                                                                                                                                                                                                                                |      |                                                                                                                       |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------|
|  | I valori riferiti a questo simbolo sono da attribuire al riduttore compatto senza motore. In questo caso, per avere il momento d'inerzia complessivo del motoriduttore, si dovrà sommare il valore corrispondente al riduttore compatto, a quello del motore da applicare (dato reperibile nelle tabelle delle caratteristiche tecniche dei motori elettrici). | <br> | I valori relativi a questi simboli sono da attribuire al riduttore predisposto per attacco motore (grandezza IEC...). |
|  |                                                                                                                                                                                                                                                                                                                                                                | <br> | I valori attribuiti al riduttore sono riferiti a questi simboli.                                                      |

### VF 27

|       |          | i  | J (•10 <sup>-4</sup> ) [kgm²] |   |                                                                                    |   |   | <br>HS |
|-------|----------|----|-------------------------------|---|------------------------------------------------------------------------------------|---|---|--------------------------------------------------------------------------------------------|
|       |          |    | P27                           |   |  |   |   |                                                                                            |
| VF 27 | VF 27_7  | 7  | 0.02                          | — | —                                                                                  | — | — | 0.02                                                                                       |
|       | VF 27_10 | 10 | 0.01                          | — | —                                                                                  | — | — | 0.01                                                                                       |
|       | VF 27_15 | 15 | 0.01                          | — | —                                                                                  | — | — | 0.01                                                                                       |
|       | VF 27_20 | 20 | 0.01                          | — | —                                                                                  | — | — | 0.01                                                                                       |
|       | VF 27_30 | 30 | 0.01                          | — | —                                                                                  | — | — | 0.01                                                                                       |
|       | VF 27_40 | 40 | 0.01                          | — | —                                                                                  | — | — | 0.01                                                                                       |
|       | VF 27_60 | 60 | 0.01                          | — | —                                                                                  | — | — | 0.01                                                                                       |
|       | VF 27_70 | 70 | 0.01                          | — | —                                                                                  | — | — | 0.01                                                                                       |

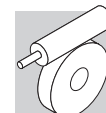
### VF 30

|       |          |    | i    |      | J (•10 <sup>-4</sup> ) [kgm²]                                                       |   |   |      |  |                                                                                       |
|-------|----------|----|------|------|-------------------------------------------------------------------------------------|---|---|------|--|---------------------------------------------------------------------------------------|
|       |          |    |      |      |  |   |   |      |  |  |
|       |          |    | P56  | P63  |                                                                                     |   |   |      |  | HS                                                                                    |
| VF 30 | VF 30_7  | 7  | 0.08 | 0.07 | —                                                                                   | — | — | 0.04 |  |                                                                                       |
|       | VF 30_10 | 10 | 0.07 | 0.06 | —                                                                                   | — | — | 0.03 |  |                                                                                       |
|       | VF 30_15 | 15 | 0.07 | 0.06 | —                                                                                   | — | — | 0.03 |  |                                                                                       |
|       | VF 30_20 | 20 | 0.06 | 0.06 | —                                                                                   | — | — | 0.03 |  |                                                                                       |
|       | VF 30_30 | 30 | 0.06 | 0.06 | —                                                                                   | — | — | 0.03 |  |                                                                                       |
|       | VF 30_40 | 40 | 0.06 | 0.06 | —                                                                                   | — | — | 0.03 |  |                                                                                       |
|       | VF 30_60 | 60 | 0.06 | 0.05 | —                                                                                   | — | — | 0.02 |  |                                                                                       |
|       | VF 30_70 | 70 | 0.06 | —    | —                                                                                   | — | — | 0.02 |  |                                                                                       |



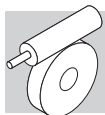
## VF 44 - VFR 44

|               |            | i   | J (•10 <sup>-4</sup> ) [kgm <sup>2</sup> ]                                               |      |      |                                                                                          |      |
|---------------|------------|-----|------------------------------------------------------------------------------------------|------|------|------------------------------------------------------------------------------------------|------|
|               |            |     | <br>S44 | P63  | P71  | <br>HS |      |
| <b>VF 44</b>  | VF 44_7    | 7   | —                                                                                        | 0.29 | 0.27 | —                                                                                        | 0.18 |
|               | VF 44_10   | 10  | —                                                                                        | 0.24 | 0.22 | —                                                                                        | 0.14 |
|               | VF 44_14   | 14  | —                                                                                        | 0.23 | 0.21 | —                                                                                        | 0.12 |
|               | VF 44_20   | 20  | —                                                                                        | 0.19 | 0.18 | —                                                                                        | 0.09 |
|               | VF 44_28   | 28  | —                                                                                        | 0.21 | 0.19 | —                                                                                        | 0.11 |
|               | VF 44_35   | 35  | —                                                                                        | 0.19 | 0.18 | —                                                                                        | 0.09 |
|               | VF 44_46   | 46  | —                                                                                        | 0.18 | —    | —                                                                                        | 0.08 |
|               | VF 44_60   | 60  | —                                                                                        | 0.17 | —    | —                                                                                        | 0.07 |
|               | VF 44_70   | 70  | —                                                                                        | 0.17 | —    | —                                                                                        | 0.07 |
|               | VF 44_100  | 100 | —                                                                                        | 0.17 | —    | —                                                                                        | 0.07 |
| <b>VFR 44</b> | VFR 44_70  | 70  | 0.21                                                                                     | —    | —    | —                                                                                        | —    |
|               | VFR 44_100 | 100 | 0.20                                                                                     | —    | —    | —                                                                                        | —    |
|               | VFR 44_140 | 140 | 0.20                                                                                     | —    | —    | —                                                                                        | —    |
|               | VFR 44_175 | 175 | 0.20                                                                                     | —    | —    | —                                                                                        | —    |
|               | VFR 44_230 | 230 | 0.20                                                                                     | —    | —    | —                                                                                        | —    |
|               | VFR 44_300 | 300 | 0.20                                                                                     | —    | —    | —                                                                                        | —    |
|               | VFR 44_350 | 350 | 0.20                                                                                     | —    | —    | —                                                                                        | —    |
|               | VFR 44_500 | 500 | 0.20                                                                                     | —    | —    | —                                                                                        | —    |



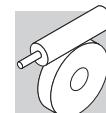
## VF 49 - VFR 49

|        |            | i   | J (•10 <sup>-4</sup> ) [kgm <sup>2</sup> ] |      |      |   |   | HS   |
|--------|------------|-----|--------------------------------------------|------|------|---|---|------|
|        |            |     | P63                                        | P71  | P80  |   |   |      |
| VF 49  | VF 49_7    | 7   | 0.69                                       | 0.67 | 0.61 | — | — | 0.42 |
|        | VF 49_10   | 10  | 0.61                                       | 0.60 | 0.53 | — | — | 0.34 |
|        | VF 49_14   | 14  | 0.58                                       | 0.57 | 0.5  | — | — | 0.31 |
|        | VF 49_18   | 18  | 0.54                                       | 0.53 | 0.46 | — | — | 0.27 |
|        | VF 49_24   | 24  | 0.52                                       | 0.5  | 0.44 | — | — | 0.24 |
|        | VF 49_28   | 28  | 0.56                                       | 0.54 | 0.48 | — | — | 0.28 |
|        | VF 49_36   | 36  | 0.53                                       | 0.51 | —    | — | — | 0.25 |
|        | VF 49_45   | 45  | 0.51                                       | 0.49 | —    | — | — | 0.24 |
|        | VF 49_60   | 60  | 0.50                                       | 0.48 | —    | — | — | 0.23 |
|        | VF 49_70   | 70  | 0.50                                       | —    | —    | — | — | 0.22 |
|        | VF 49_80   | 80  | 0.49                                       | —    | —    | — | — | 0.22 |
|        | VF 49_100  | 100 | 0.49                                       | —    | —    | — | — | 0.22 |
| VFR 49 | VFR 49_30  | 30  | 0.74                                       | —    | —    | — | — | 0.94 |
|        | VFR 49_42  | 42  | 0.73                                       | —    | —    | — | — | 0.93 |
|        | VFR 49_54  | 54  | 0.73                                       | —    | —    | — | — | 0.93 |
|        | VFR 49_72  | 72  | 0.73                                       | —    | —    | — | — | 0.93 |
|        | VFR 49_84  | 84  | 0.73                                       | —    | —    | — | — | 0.93 |
|        | VFR 49_108 | 108 | 0.73                                       | —    | —    | — | — | 0.93 |
|        | VFR 49_135 | 135 | 0.73                                       | —    | —    | — | — | 0.93 |
|        | VFR 49_180 | 180 | 0.73                                       | —    | —    | — | — | 0.93 |
|        | VFR 49_210 | 210 | 0.72                                       | —    | —    | — | — | 0.92 |
|        | VFR 49_240 | 240 | 0.72                                       | —    | —    | — | — | 0.92 |
|        | VFR 49_300 | 300 | 0.72                                       | —    | —    | — | — | 0.92 |

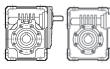


## W 63 - WR 63

|              |           | i   | J (•10 <sup>-4</sup> ) [kgm <sup>2</sup> ]                                        |     |    |                                                                                                                                                                       |      |     |     |   |                                                                                                                                                                         |      |
|--------------|-----------|-----|-----------------------------------------------------------------------------------|-----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----|-----|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
|              |           |     |  |     |    |   |      |     |     |   |   |      |
|              |           |     | S1                                                                                | S2  | S3 | P63                                                                                                                                                                   | P71  | P80 | P90 |   |                                                                                                                                                                         | HS   |
| <b>W 63</b>  | W 63_7    | 7   | 3.4                                                                               | 3.6 | —  | —                                                                                                                                                                     | 3.5  | 3.5 | 3.5 | — | —                                                                                                                                                                       | 3.6  |
|              | W 63_10   | 10  | 3.1                                                                               | 3.3 | —  | —                                                                                                                                                                     | 3.2  | 3.3 | 3.2 | — | —                                                                                                                                                                       | 3.3  |
|              | W 63_12   | 12  | 3.1                                                                               | 3.3 | —  | —                                                                                                                                                                     | 3.1  | 3.2 | 3.1 | — | —                                                                                                                                                                       | 3.3  |
|              | W 63_15   | 15  | 3.0                                                                               | 3.2 | —  | —                                                                                                                                                                     | 3.0  | 3.1 | 3.0 | — | —                                                                                                                                                                       | 3.2  |
|              | W 63_19   | 19  | 2.9                                                                               | 3.1 | —  | —                                                                                                                                                                     | 2.9  | 3.0 | 2.9 | — | —                                                                                                                                                                       | 3.1  |
|              | W 63_24   | 24  | 2.8                                                                               | 3.1 | —  | —                                                                                                                                                                     | 2.9  | 3.0 | 2.9 | — | —                                                                                                                                                                       | 3.0  |
|              | W 63_30   | 30  | 2.9                                                                               | 3.1 | —  | —                                                                                                                                                                     | 2.9  | 3.0 | 2.9 | — | —                                                                                                                                                                       | 3.1  |
|              | W 63_38   | 38  | 2.8                                                                               | 3.1 | —  | —                                                                                                                                                                     | 2.9  | 3.0 | 2.9 | — | —                                                                                                                                                                       | 3.0  |
|              | W 63_45   | 45  | 2.8                                                                               | 3.0 | —  | —                                                                                                                                                                     | 2.9  | 2.9 | 2.9 | — | —                                                                                                                                                                       | 3.0  |
|              | W 63_64   | 64  | 2.8                                                                               | 3.0 | —  | —                                                                                                                                                                     | 2.8  | 2.9 | 2.8 | — | —                                                                                                                                                                       | 3.0  |
|              | W 63_80   | 80  | 2.8                                                                               | 3.0 | —  | —                                                                                                                                                                     | 2.8  | 2.9 | 2.8 | — | —                                                                                                                                                                       | 3.0  |
|              | W 63_100  | 100 | 2.8                                                                               | 3.0 | —  | —                                                                                                                                                                     | 2.8  | 2.9 | 2.8 | — | —                                                                                                                                                                       | 2.9  |
| <b>WR 63</b> | WR 63_21  | 21  | —                                                                                 | —   | —  | 0.84                                                                                                                                                                  | 0.83 | —   | —   | — | —                                                                                                                                                                       | 0.81 |
|              | WR 63_30  | 30  | —                                                                                 | —   | —  | 0.81                                                                                                                                                                  | 0.80 | —   | —   | — | —                                                                                                                                                                       | 0.78 |
|              | WR 63_36  | 36  | —                                                                                 | —   | —  | 0.81                                                                                                                                                                  | 0.80 | —   | —   | — | —                                                                                                                                                                       | 0.77 |
|              | WR 63_45  | 45  | —                                                                                 | —   | —  | 0.80                                                                                                                                                                  | 0.79 | —   | —   | — | —                                                                                                                                                                       | 0.76 |
|              | WR 63_57  | 57  | —                                                                                 | —   | —  | 0.79                                                                                                                                                                  | 0.78 | —   | —   | — | —                                                                                                                                                                       | 0.75 |
|              | WR 63_72  | 72  | —                                                                                 | —   | —  | 0.78                                                                                                                                                                  | 0.77 | —   | —   | — | —                                                                                                                                                                       | 0.74 |
|              | WR 63_90  | 90  | —                                                                                 | —   | —  | 0.79                                                                                                                                                                  | 0.78 | —   | —   | — | —                                                                                                                                                                       | 0.75 |
|              | WR 63_114 | 114 | —                                                                                 | —   | —  | 0.78                                                                                                                                                                  | 0.77 | —   | —   | — | —                                                                                                                                                                       | 0.74 |
|              | WR 63_135 | 135 | —                                                                                 | —   | —  | 0.78                                                                                                                                                                  | 0.77 | —   | —   | — | —                                                                                                                                                                       | 0.74 |
|              | WR 63_192 | 192 | —                                                                                 | —   | —  | 0.77                                                                                                                                                                  | 0.76 | —   | —   | — | —                                                                                                                                                                       | 0.74 |
|              | WR 63_240 | 240 | —                                                                                 | —   | —  | 0.77                                                                                                                                                                  | 0.76 | —   | —   | — | —                                                                                                                                                                       | 0.74 |
|              | WR 63_300 | 300 | —                                                                                 | —   | —  | 0.77                                                                                                                                                                  | 0.76 | —   | —   | — | —                                                                                                                                                                       | 0.73 |

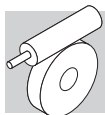


## W 75 - WR 75

|       |           |     | J (•10-4) [kgm²]                                                                  |     |     |                                                                                                                                                                       |     |     |     |      |      |                                                                                     |
|-------|-----------|-----|-----------------------------------------------------------------------------------|-----|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|------|------|-------------------------------------------------------------------------------------|
|       |           |     |  |     |     |   |     |     |     |      |      |  |
|       |           |     | S1                                                                                | S2  | S3  | P63                                                                                                                                                                   | P71 | P80 | P90 | P100 | P112 | HS                                                                                  |
| W 75  | W 75_7    | 7   | 6.9                                                                               | 6.6 | 6.6 | —                                                                                                                                                                     | 6.9 | 7.0 | 6.9 | 6.9  | 6.9  | 7.3                                                                                 |
|       | W 75_10   | 10  | 6.4                                                                               | 6.1 | 6.1 | —                                                                                                                                                                     | 6.4 | 6.4 | 6.3 | 5.7  | 5.7  | 6.8                                                                                 |
|       | W 75_15   | 15  | 6.1                                                                               | 5.8 | 5.8 | —                                                                                                                                                                     | 6.1 | 6.1 | 6.0 | 5.3  | 5.3  | 6.5                                                                                 |
|       | W 75_20   | 20  | 5.9                                                                               | 5.6 | 5.6 | —                                                                                                                                                                     | 5.9 | 5.9 | 5.9 | 5.2  | 5.2  | 6.3                                                                                 |
|       | W 75_25   | 25  | 5.9                                                                               | 5.6 | 5.6 | —                                                                                                                                                                     | 6.0 | 6.0 | 5.9 | 5.2  | 5.2  | 6.3                                                                                 |
|       | W 75_30   | 30  | 5.9                                                                               | 5.6 | 5.6 | —                                                                                                                                                                     | 5.9 | 5.9 | 5.9 | 5.2  | 5.2  | 6.3                                                                                 |
|       | W 75_40   | 40  | 5.9                                                                               | 5.6 | 5.6 | —                                                                                                                                                                     | 5.9 | 5.9 | 5.8 | 5.2  | 5.2  | 6.3                                                                                 |
|       | W 75_50   | 50  | 5.9                                                                               | 5.6 | 5.6 | —                                                                                                                                                                     | 5.9 | 5.9 | 5.8 | 5.1  | 5.1  | 6.2                                                                                 |
|       | W 75_60   | 60  | 5.8                                                                               | 5.5 | 5.5 | —                                                                                                                                                                     | 5.8 | 5.9 | 5.8 | 5.1  | 5.1  | 6.2                                                                                 |
|       | W 75_80   | 80  | 5.8                                                                               | 5.5 | 5.5 | —                                                                                                                                                                     | 5.8 | 5.8 | 5.8 | 5.1  | 5.1  | 6.2                                                                                 |
|       | W 75_100  | 100 | 5.8                                                                               | 5.5 | 5.5 | —                                                                                                                                                                     | 5.8 | 5.8 | 5.7 | 5.0  | 5.0  | 6.2                                                                                 |
| WR 75 | WR 75_21  | 21  | —                                                                                 | —   | —   | 1.2                                                                                                                                                                   | 1.2 | 2.1 | —   | —    | —    | 1.9                                                                                 |
|       | WR 75_30  | 30  | —                                                                                 | —   | —   | 1.1                                                                                                                                                                   | 1.1 | 2.1 | —   | —    | —    | 1.1                                                                                 |
|       | WR 75_45  | 45  | —                                                                                 | —   | —   | 1.1                                                                                                                                                                   | 1.1 | 2.0 | —   | —    | —    | 1.1                                                                                 |
|       | WR 75_60  | 60  | —                                                                                 | —   | —   | 1.1                                                                                                                                                                   | 1.1 | 2.0 | —   | —    | —    | 1.0                                                                                 |
|       | WR 75_75  | 75  | —                                                                                 | —   | —   | 1.1                                                                                                                                                                   | 1.1 | 2.0 | —   | —    | —    | 1.0                                                                                 |
|       | WR 75_90  | 90  | —                                                                                 | —   | —   | 1.1                                                                                                                                                                   | 1.1 | 2.0 | —   | —    | —    | 1.0                                                                                 |
|       | WR 75_120 | 120 | —                                                                                 | —   | —   | 1.1                                                                                                                                                                   | 1.1 | 2.0 | —   | —    | —    | 1.0                                                                                 |
|       | WR 75_150 | 150 | —                                                                                 | —   | —   | 1.1                                                                                                                                                                   | 1.1 | 2.0 | —   | —    | —    | 1.0                                                                                 |
|       | WR 75_180 | 180 | —                                                                                 | —   | —   | 1.1                                                                                                                                                                   | 1.1 | 2.0 | —   | —    | —    | 1.0                                                                                 |
|       | WR 75_240 | 240 | —                                                                                 | —   | —   | 1.1                                                                                                                                                                   | 1.1 | 2.0 | —   | —    | —    | 1.0                                                                                 |
|       | WR 75_300 | 300 | —                                                                                 | —   | —   | 1.1                                                                                                                                                                   | 1.1 | 2.0 | —   | —    | —    | 1.0                                                                                 |

|  |  | i | J (•10 <sup>-4</sup> ) [kgm <sup>2</sup> ]                                                 |
|--|--|---|--------------------------------------------------------------------------------------------|
|  |  |   | <br>P90 |

|                     |            |      |     |
|---------------------|------------|------|-----|
| <b>WR 75_P90 B5</b> | WR 75_15   | 15   | 6.0 |
|                     | WR 75_22.5 | 22.5 | 5.9 |
|                     | WR 75_30   | 30   | 5.8 |
|                     | WR 75_37.5 | 37.5 | 5.8 |
|                     | WR 75_45   | 45   | 5.8 |
|                     | WR 75_60   | 60   | 5.8 |
|                     | WR 75_75   | 75   | 5.8 |
|                     | WR 75_90   | 90   | 5.7 |
|                     | WR 75_120  | 120  | 5.7 |
|                     | WR 75_150  | 150  | 5.7 |



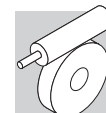
## W 86 - WR 86

|             |          | i   | J (•10 <sup>-4</sup> ) [kgm <sup>2</sup> ]                                        |     |     |                                                                                                                                                                       |     |     |     |      |                                                                                                                                                                         |      |
|-------------|----------|-----|-----------------------------------------------------------------------------------|-----|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
|             |          |     |  |     |     |   |     |     |     |      |   |      |
|             |          |     | S1                                                                                | S2  | S3  | P63                                                                                                                                                                   | P71 | P80 | P90 | P100 | HS                                                                                                                                                                      |      |
| <b>W 86</b> | W 86_7   | 7   | 9.7                                                                               | 9.4 | 9.4 | —                                                                                                                                                                     | 9.7 | 9.7 | 9.6 | 9.6  | —                                                                                                                                                                       | 10.1 |
|             | W 86_10  | 10  | 8.4                                                                               | 8.1 | 8.1 | —                                                                                                                                                                     | 8.4 | 8.4 | 8.3 | 7.7  | —                                                                                                                                                                       | 8.9  |
|             | W 86_15  | 15  | 7.7                                                                               | 7.4 | 7.4 | —                                                                                                                                                                     | 7.7 | 7.7 | 7.7 | 7.0  | —                                                                                                                                                                       | 8.2  |
|             | W 86_20  | 20  | 6.9                                                                               | 6.6 | 6.6 | —                                                                                                                                                                     | 6.9 | 7.0 | 6.9 | 6.2  | —                                                                                                                                                                       | 7.4  |
|             | W 86_23  | 23  | 6.8                                                                               | 6.5 | 6.5 | —                                                                                                                                                                     | 6.8 | 6.9 | 6.8 | 6.1  | —                                                                                                                                                                       | 7.3  |
|             | W 86_30  | 30  | 7.3                                                                               | 7.0 | 7.0 | —                                                                                                                                                                     | 7.3 | 7.3 | 7.3 | 6.6  | —                                                                                                                                                                       | 7.8  |
|             | W 86_40  | 40  | 6.7                                                                               | 6.4 | 6.4 | —                                                                                                                                                                     | 6.7 | 6.7 | 6.6 | 6.0  | —                                                                                                                                                                       | 7.2  |
|             | W 86_46  | 46  | 6.7                                                                               | 6.4 | 6.4 | —                                                                                                                                                                     | 6.7 | 6.7 | 6.6 | 5.9  | —                                                                                                                                                                       | 7.1  |
|             | W 86_56  | 56  | 6.6                                                                               | 6.3 | 6.3 | —                                                                                                                                                                     | 6.6 | 6.7 | 6.6 | 5.9  | —                                                                                                                                                                       | 7.1  |
|             | W 86_64  | 64  | 6.6                                                                               | 6.3 | 6.3 | —                                                                                                                                                                     | 6.6 | 6.6 | 6.5 | 5.9  | —                                                                                                                                                                       | 7.1  |
|             | W 86_80  | 80  | 6.6                                                                               | 6.3 | 6.3 | —                                                                                                                                                                     | 6.6 | 6.6 | 6.5 | 5.9  | —                                                                                                                                                                       | 7.1  |
|             | W 86_100 | 100 | 6.4                                                                               | 6.1 | 6.1 | —                                                                                                                                                                     | 6.4 | 6.5 | 6.4 | 5.7  | —                                                                                                                                                                       | 6.9  |

|              |           |     |   |   |   |     |     |     |   |   |   |     |
|--------------|-----------|-----|---|---|---|-----|-----|-----|---|---|---|-----|
| <b>WR 86</b> | WR 86_21  | 21  | — | — | — | 1.5 | 1.5 | 2.4 | — | — | — | 2.2 |
|              | WR 86_30  | 30  | — | — | — | 1.4 | 1.3 | 2.3 | — | — | — | 1.3 |
|              | WR 86_45  | 45  | — | — | — | 1.3 | 1.3 | 2.2 | — | — | — | 1.2 |
|              | WR 86_60  | 60  | — | — | — | 1.2 | 1.2 | 2.1 | — | — | — | 1.2 |
|              | WR 86_69  | 69  | — | — | — | 1.2 | 1.2 | 2.1 | — | — | — | 1.1 |
|              | WR 86_90  | 90  | — | — | — | 1.2 | 1.2 | 2.2 | — | — | — | 1.2 |
|              | WR 86_120 | 120 | — | — | — | 1.2 | 1.2 | 2.1 | — | — | — | 1.1 |
|              | WR 86_138 | 138 | — | — | — | 1.2 | 1.2 | 2.1 | — | — | — | 1.1 |
|              | WR 86_168 | 168 | — | — | — | 1.2 | 1.2 | 2.1 | — | — | — | 1.1 |
|              | WR 86_192 | 192 | — | — | — | 1.2 | 1.1 | 2.1 | — | — | — | 1.1 |
|              | WR 86_240 | 240 | — | — | — | 1.2 | 1.1 | 2.1 | — | — | — | 1.1 |
|              | WR 86_300 | 300 | — | — | — | 1.1 | 1.1 | 2.1 | — | — | — | 1.1 |

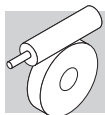
|  |  | i | J (•10 <sup>-4</sup> ) [kgm <sup>2</sup> ]                                                 |
|--|--|---|--------------------------------------------------------------------------------------------|
|  |  |   | <br>P90 |

|                     |            |      |     |
|---------------------|------------|------|-----|
| <b>WR 86_P90 B5</b> | WR 86_15   | 15   | 6.9 |
|                     | WR 86_22.5 | 22.5 | 6.6 |
|                     | WR 86_30   | 30   | 6.3 |
|                     | WR 86_34.5 | 34.5 | 6.2 |
|                     | WR 86_45   | 45   | 6.4 |
|                     | WR 86_60   | 60   | 6.2 |
|                     | WR 86_69   | 69   | 6.1 |
|                     | WR 86_84   | 84   | 6.1 |
|                     | WR 86_96   | 96   | 6.0 |
|                     | WR 86_120  | 120  | 6.0 |
|                     | WR 86_150  | 150  | 5.9 |



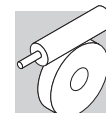
## W 110 - WR 110

|               |            | i   | J (•10 <sup>-4</sup> ) [kgm <sup>2</sup> ]                                        |    |    |                                                                                                                                                                       |     |     |     |      |                                                                                                                                                                         |     |
|---------------|------------|-----|-----------------------------------------------------------------------------------|----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|               |            |     |  |    |    |   |     |     |     |      |   |     |
|               |            |     | S1                                                                                | S2 | S3 | P63                                                                                                                                                                   | P71 | P80 | P90 | P100 | P132                                                                                                                                                                    | HS  |
| <b>W 110</b>  | W 110_7    | 7   | —                                                                                 | 22 | 22 | —                                                                                                                                                                     | —   | 23  | 23  | 23   | 28                                                                                                                                                                      | 23  |
|               | W 110_10   | 10  | —                                                                                 | 19 | 19 | —                                                                                                                                                                     | —   | 19  | 19  | 24   | 24                                                                                                                                                                      | 20  |
|               | W 110_15   | 15  | —                                                                                 | 17 | 17 | —                                                                                                                                                                     | —   | 17  | 17  | 22   | 22                                                                                                                                                                      | 17  |
|               | W 110_20   | 20  | —                                                                                 | 14 | 14 | —                                                                                                                                                                     | —   | 14  | 14  | 19   | 19                                                                                                                                                                      | 15  |
|               | W 110_23   | 23  | —                                                                                 | 14 | 14 | —                                                                                                                                                                     | —   | 14  | 14  | 19   | 19                                                                                                                                                                      | 15  |
|               | W 110_30   | 30  | —                                                                                 | 15 | 15 | —                                                                                                                                                                     | —   | 16  | 16  | 20   | 20                                                                                                                                                                      | 16  |
|               | W 110_40   | 40  | —                                                                                 | 13 | 13 | —                                                                                                                                                                     | —   | 14  | 14  | 19   | 19                                                                                                                                                                      | 14  |
|               | W 110_46   | 46  | —                                                                                 | 13 | 13 | —                                                                                                                                                                     | —   | 13  | 13  | 18   | 18                                                                                                                                                                      | 14  |
|               | W 110_56   | 56  | —                                                                                 | 13 | 13 | —                                                                                                                                                                     | —   | 13  | 13  | 18   | 18                                                                                                                                                                      | 14  |
|               | W 110_64   | 64  | —                                                                                 | 13 | 13 | —                                                                                                                                                                     | —   | 13  | 13  | 18   | 18                                                                                                                                                                      | 14  |
|               | W 110_80   | 80  | —                                                                                 | 13 | 13 | —                                                                                                                                                                     | —   | 13  | 13  | 18   | 18                                                                                                                                                                      | 14  |
|               | W 110_100  | 100 | —                                                                                 | 13 | 13 | —                                                                                                                                                                     | —   | 13  | 13  | 18   | 18                                                                                                                                                                      | 14  |
| <b>WR 110</b> | WR 110_21  | 21  | —                                                                                 | —  | —  | —                                                                                                                                                                     | 3.0 | 9.0 | 8.8 | 8.9  | —                                                                                                                                                                       | 9.2 |
|               | WR 110_30  | 30  | —                                                                                 | —  | —  | —                                                                                                                                                                     | 2.5 | 8.6 | 8.4 | 8.4  | —                                                                                                                                                                       | 8.8 |
|               | WR 110_45  | 45  | —                                                                                 | —  | —  | —                                                                                                                                                                     | 2.3 | 8.3 | 8.2 | 8.2  | —                                                                                                                                                                       | 8.5 |
|               | WR 110_60  | 60  | —                                                                                 | —  | —  | —                                                                                                                                                                     | 2.0 | 8.1 | 7.9 | 7.9  | —                                                                                                                                                                       | 8.3 |
|               | WR 110_69  | 69  | —                                                                                 | —  | —  | —                                                                                                                                                                     | 2.0 | 8.0 | 7.9 | 7.9  | —                                                                                                                                                                       | 8.2 |
|               | WR 110_90  | 90  | —                                                                                 | —  | —  | —                                                                                                                                                                     | 2.2 | 8.2 | 8.1 | 8.1  | —                                                                                                                                                                       | 8.4 |
|               | WR 110_120 | 120 | —                                                                                 | —  | —  | —                                                                                                                                                                     | 1.9 | 8.0 | 7.8 | 7.9  | —                                                                                                                                                                       | 8.2 |
|               | WR 110_138 | 138 | —                                                                                 | —  | —  | —                                                                                                                                                                     | 1.9 | 8.0 | 7.8 | 7.8  | —                                                                                                                                                                       | 8.2 |
|               | WR 110_168 | 168 | —                                                                                 | —  | —  | —                                                                                                                                                                     | 1.9 | 8.0 | 7.8 | 7.8  | —                                                                                                                                                                       | 8.1 |
|               | WR 110_192 | 192 | —                                                                                 | —  | —  | —                                                                                                                                                                     | 1.9 | 7.9 | 7.8 | 7.8  | —                                                                                                                                                                       | 8.1 |
|               | WR 110_240 | 240 | —                                                                                 | —  | —  | —                                                                                                                                                                     | 1.9 | 7.9 | 7.8 | 7.8  | —                                                                                                                                                                       | 8.1 |
|               | WR 110_300 | 300 | —                                                                                 | —  | —  | —                                                                                                                                                                     | 1.9 | 7.9 | 7.8 | 7.8  | —                                                                                                                                                                       | 8.1 |



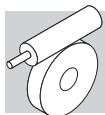
## VF 130 - VFR 130

|         |             | i   | J (•10 <sup>-4</sup> ) [kgm <sup>2</sup> ] |     |      |      |      |     |
|---------|-------------|-----|--------------------------------------------|-----|------|------|------|-----|
|         |             |     | P80                                        | P90 | P100 | P112 | P132 | HS  |
| VF 130  | VF 130_7    | 7   | —                                          | —   | 36   | 36   | 35   | 31  |
|         | VF 130_10   | 10  | —                                          | —   | 27   | 27   | 25   | 22  |
|         | VF 130_15   | 15  | —                                          | —   | 20   | 20   | 18   | 15  |
|         | VF 130_20   | 20  | —                                          | —   | 17   | 17   | 15   | 11  |
|         | VF 130_23   | 23  | —                                          | —   | 16   | 16   | 14   | 11  |
|         | VF 130_30   | 30  | —                                          | —   | 17   | 17   | 15   | 12  |
|         | VF 130_40   | 40  | —                                          | —   | 15   | 15   | 14   | 9.9 |
|         | VF 130_46   | 46  | —                                          | 14  | 14   | 14   | —    | 8.2 |
|         | VF 130_56   | 56  | —                                          | 13  | 13   | 13   | —    | 7.8 |
|         | VF 130_64   | 64  | —                                          | 13  | 13   | 13   | —    | 7.4 |
|         | VF 130_80   | 80  | —                                          | 13  | 12   | 12   | —    | 7.0 |
|         | VF 130_100  | 100 | —                                          | 13  | —    | —    | —    | 8.9 |
| VFR 130 | VFR 130_30  | 30  | 5.3                                        | 5.3 | 5.2  | 5.2  | —    | 5.7 |
|         | VFR 130_45  | 45  | 4.5                                        | 4.5 | 4.4  | 4.4  | —    | 4.9 |
|         | VFR 130_60  | 60  | 4.2                                        | 4.1 | 4.1  | 4.1  | —    | 4.6 |
|         | VFR 130_69  | 69  | 4.1                                        | 4.0 | 4.0  | 4.0  | —    | 4.5 |
|         | VFR 130_90  | 90  | 4.2                                        | 4.1 | 4.1  | 4.1  | —    | 4.6 |
|         | VFR 130_120 | 120 | 4.0                                        | 3.9 | 4.0  | 4.0  | —    | 4.4 |
|         | VFR 130_138 | 138 | 3.8                                        | 3.8 | 3.7  | 3.7  | —    | 4.2 |
|         | VFR 130_168 | 168 | 3.8                                        | 3.7 | 3.7  | 3.7  | —    | 4.1 |
|         | VFR 130_192 | 192 | 3.7                                        | 3.7 | 3.6  | 3.6  | —    | 4.1 |
|         | VFR 130_240 | 240 | 3.7                                        | 3.6 | 3.6  | 3.6  | —    | 4.1 |
|         | VFR 130_300 | 300 | 3.9                                        | 3.8 | 3.8  | 3.8  | —    | 4.3 |

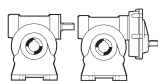


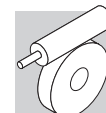
## VF 150 - VFR 150

|         |              | i    | J ( $\cdot 10^{-4}$ ) [kgm <sup>2</sup> ] |      |      |      |     |
|---------|--------------|------|-------------------------------------------|------|------|------|-----|
|         |              |      | P90                                       | P100 | P112 | P132 | HS  |
| VF 150  | VF 150_7     | 7    | —                                         | —    | —    | 58   | 50  |
|         | VF 150_10    | 10   | —                                         | —    | —    | 44   | 35  |
|         | VF 150_15    | 15   | —                                         | —    | —    | 29   | 21  |
|         | VF 150_20    | 20   | —                                         | —    | —    | 27   | 19  |
|         | VF 150_23    | 23   | —                                         | 28   | 28   | 26   | 17  |
|         | VF 150_30    | 30   | —                                         | 31   | 31   | 29   | 21  |
|         | VF 150_40    | 40   | —                                         | 26   | 26   | 24   | 16  |
|         | VF 150_46    | 46   | —                                         | 24   | 24   | 22   | 13  |
|         | VF 150_56    | 56   | 25                                        | 24   | 24   | —    | 13  |
|         | VF 150_64    | 64   | 24                                        | 23   | 23   | —    | 12  |
|         | VF 150_80    | 80   | 23                                        | 22   | 22   | —    | 11  |
|         | VF 150_100   | 100  | 23                                        | 22   | 22   | —    | 11  |
| VFR 150 | VFR 150_25   | 25   | —                                         | —    | —    | 15   | —   |
|         | VFR 150_30   | 30   | 10                                        | 10   | 10   | —    | 11  |
|         | VFR 150_37.5 | 37.5 | —                                         | —    | —    | 13   | —   |
|         | VFR 150_45   | 45   | 8.8                                       | 8.8  | 8.8  | —    | 9.7 |
|         | VFR 150_50   | 50   | —                                         | —    | —    | 12   | —   |
|         | VFR 150_60   | 60   | 8.3                                       | 8.3  | 8.3  | —    | 9.2 |
|         | VFR 150_69   | 69   | 8.4                                       | 8.4  | 8.4  | —    | 9.3 |
|         | VFR 150_90   | 90   | 8.7                                       | 8.7  | 8.7  | —    | 9.7 |
|         | VFR 150_120  | 120  | 8.2                                       | 8.2  | 8.2  | —    | 9.2 |
|         | VFR 150_138  | 138  | 7.9                                       | 7.9  | 7.9  | —    | 8.9 |
|         | VFR 150_168  | 168  | 7.9                                       | 7.9  | 7.9  | —    | 8.9 |
|         | VFR 150_192  | 192  | 7.8                                       | 7.8  | 7.8  | —    | 8.8 |
|         | VFR 150_240  | 240  | 7.7                                       | 7.7  | 7.7  | —    | 8.6 |
|         | VFR 150_300  | 300  | 7.7                                       | 7.7  | 7.7  | —    | 8.6 |

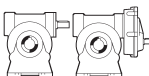


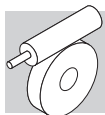
## VF 185 - VFR 185

|         |              |      | J (•10-4) [kgm²]                                                                  |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|---------|--------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|         |              |      |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|         |              |      |  |  |  |  |  |  |                                                                                     |
| i       |              |      | P90                                                                               | P100                                                                              | P112                                                                                | P132                                                                                | P160                                                                                | P180                                                                                | HS                                                                                  |
| VF 185  | VF 185_7     | 7    | —                                                                                 | —                                                                                 | —                                                                                   | —                                                                                   | —                                                                                   | 146                                                                                 | 128                                                                                 |
|         | VF 185_10    | 10   | —                                                                                 | —                                                                                 | —                                                                                   | —                                                                                   | —                                                                                   | 108                                                                                 | 91                                                                                  |
|         | VF 185_15    | 15   | —                                                                                 | —                                                                                 | —                                                                                   | —                                                                                   | 70                                                                                  | 88                                                                                  | 50                                                                                  |
|         | VF 185_20    | 20   | —                                                                                 | —                                                                                 | —                                                                                   | —                                                                                   | 69                                                                                  | 66                                                                                  | 48                                                                                  |
|         | VF 185_30    | 30   | —                                                                                 | —                                                                                 | —                                                                                   | 58                                                                                  | 54                                                                                  | —                                                                                   | 34                                                                                  |
|         | VF 185_40    | 40   | —                                                                                 | —                                                                                 | —                                                                                   | 63                                                                                  | 61                                                                                  | —                                                                                   | 41                                                                                  |
|         | VF 185_50    | 50   | —                                                                                 | 59                                                                                | 59                                                                                  | 58                                                                                  | —                                                                                   | —                                                                                   | 35                                                                                  |
|         | VF 185_60    | 60   | —                                                                                 | 55                                                                                | 55                                                                                  | 53                                                                                  | —                                                                                   | —                                                                                   | 31                                                                                  |
|         | VF 185_80    | 80   | —                                                                                 | 52                                                                                | 52                                                                                  | 51                                                                                  | —                                                                                   | —                                                                                   | 28                                                                                  |
|         | VF 185_100   | 100  | —                                                                                 | 51                                                                                | 51                                                                                  | —                                                                                   | —                                                                                   | —                                                                                   | 27                                                                                  |
| VFR 185 | VFR 185_25   | 25   | —                                                                                 | —                                                                                 | —                                                                                   | 24                                                                                  | —                                                                                   | —                                                                                   | —                                                                                   |
|         | VFR 185_30   | 30   | 17                                                                                | 17                                                                                | 17                                                                                  | —                                                                                   | —                                                                                   | —                                                                                   | 18                                                                                  |
|         | VFR 185_37.5 | 37.5 | —                                                                                 | —                                                                                 | —                                                                                   | 17                                                                                  | —                                                                                   | —                                                                                   | —                                                                                   |
|         | VFR 185_45   | 45   | 12                                                                                | 12                                                                                | 12                                                                                  | —                                                                                   | —                                                                                   | —                                                                                   | 13                                                                                  |
|         | VFR 185_50   | 50   | —                                                                                 | —                                                                                 | —                                                                                   | 17                                                                                  | —                                                                                   | —                                                                                   | —                                                                                   |
|         | VFR 185_60   | 60   | 12                                                                                | 12                                                                                | 12                                                                                  | —                                                                                   | —                                                                                   | —                                                                                   | 13                                                                                  |
|         | VFR 185_75   | 75   | —                                                                                 | —                                                                                 | —                                                                                   | 15                                                                                  | —                                                                                   | —                                                                                   | —                                                                                   |
|         | VFR 185_90   | 90   | 10                                                                                | 10                                                                                | 10                                                                                  | —                                                                                   | —                                                                                   | —                                                                                   | 11                                                                                  |
|         | VFR 185_100  | 100  | —                                                                                 | —                                                                                 | —                                                                                   | 16                                                                                  | —                                                                                   | —                                                                                   | —                                                                                   |
|         | VFR 185_120  | 120  | 11                                                                                | 11                                                                                | 11                                                                                  | —                                                                                   | —                                                                                   | —                                                                                   | 12                                                                                  |
|         | VFR 185_150  | 150  | 10                                                                                | 10                                                                                | 10                                                                                  | —                                                                                   | —                                                                                   | —                                                                                   | 11                                                                                  |
|         | VFR 185_180  | 180  | 9.9                                                                               | 9.9                                                                               | 9.9                                                                                 | —                                                                                   | —                                                                                   | —                                                                                   | 11                                                                                  |
|         | VFR 185_240  | 240  | 9.6                                                                               | 9.6                                                                               | 9.6                                                                                 | —                                                                                   | —                                                                                   | —                                                                                   | 11                                                                                  |
|         | VFR 185_300  | 300  | 9.5                                                                               | 9.4                                                                               | 9.4                                                                                 | —                                                                                   | —                                                                                   | —                                                                                   | 10                                                                                  |



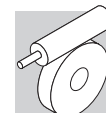
## VF 210 - VFR 210

|         |             |     | J (•10 <sup>-4</sup> ) [kgm <sup>2</sup> ]                                                                                                                          |      |      |      |      |      |      |                                                                                     |
|---------|-------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|-------------------------------------------------------------------------------------|
|         |             |     |   |      |      |      |      |      |      |  |
|         |             |     | P100                                                                                                                                                                | P112 | P132 | P160 | P180 | P200 | P225 | HS                                                                                  |
| VF 210  | VF 210_7    | 7   | —                                                                                                                                                                   | —    | 286  | 286  | 286  | 286  | 286  | 286                                                                                 |
|         | VF 210_10   | 10  | —                                                                                                                                                                   | —    | 177  | 177  | 177  | 177  | 177  | 177                                                                                 |
|         | VF 210_15   | 15  | —                                                                                                                                                                   | —    | 120  | 120  | 120  | 120  | 120  | 120                                                                                 |
|         | VF 210_20   | 20  | —                                                                                                                                                                   | —    | 116  | 116  | 116  | 116  | 116  | 116                                                                                 |
|         | VF 210_30   | 30  | —                                                                                                                                                                   | —    | 81   | 81   | 81   | 81   | 81   | 81                                                                                  |
|         | VF 210_40   | 40  | —                                                                                                                                                                   | —    | 98   | 98   | 98   | 98   | 98   | 98                                                                                  |
|         | VF 210_50   | 50  | —                                                                                                                                                                   | —    | 84   | 84   | 84   | 84   | 84   | 84                                                                                  |
|         | VF 210_60   | 60  | —                                                                                                                                                                   | —    | 75   | 75   | 75   | 75   | 75   | 75                                                                                  |
|         | VF 210_80   | 80  | —                                                                                                                                                                   | —    | 68   | 68   | 68   | 68   | 68   | 68                                                                                  |
|         | VF 210_100  | 100 | —                                                                                                                                                                   | —    | 63   | 63   | 63   | 63   | 63   | 63                                                                                  |
| VFR 210 | VFR 210_30  | 30  | 48                                                                                                                                                                  | 48   | 47   | 47   | —    | —    | —    | 51                                                                                  |
|         | VFR 210_45  | 45  | 41                                                                                                                                                                  | 41   | 41   | 41   | —    | —    | —    | 45                                                                                  |
|         | VFR 210_60  | 60  | 41                                                                                                                                                                  | 41   | 41   | 40   | —    | —    | —    | 45                                                                                  |
|         | VFR 210_90  | 90  | 37                                                                                                                                                                  | 37   | 37   | 36   | —    | —    | —    | 41                                                                                  |
|         | VFR 210_120 | 120 | 39                                                                                                                                                                  | 39   | 39   | 38   | —    | —    | —    | 43                                                                                  |
|         | VFR 210_150 | 150 | 37                                                                                                                                                                  | 37   | 37   | 37   | —    | —    | —    | 41                                                                                  |
|         | VFR 210_180 | 180 | 36                                                                                                                                                                  | 36   | 36   | 36   | —    | —    | —    | 40                                                                                  |
|         | VFR 210_240 | 240 | 36                                                                                                                                                                  | 36   | 36   | 35   | —    | —    | —    | 39                                                                                  |
|         | VFR 210_300 | 300 | 35                                                                                                                                                                  | 35   | 35   | 34   | —    | —    | —    | 39                                                                                  |



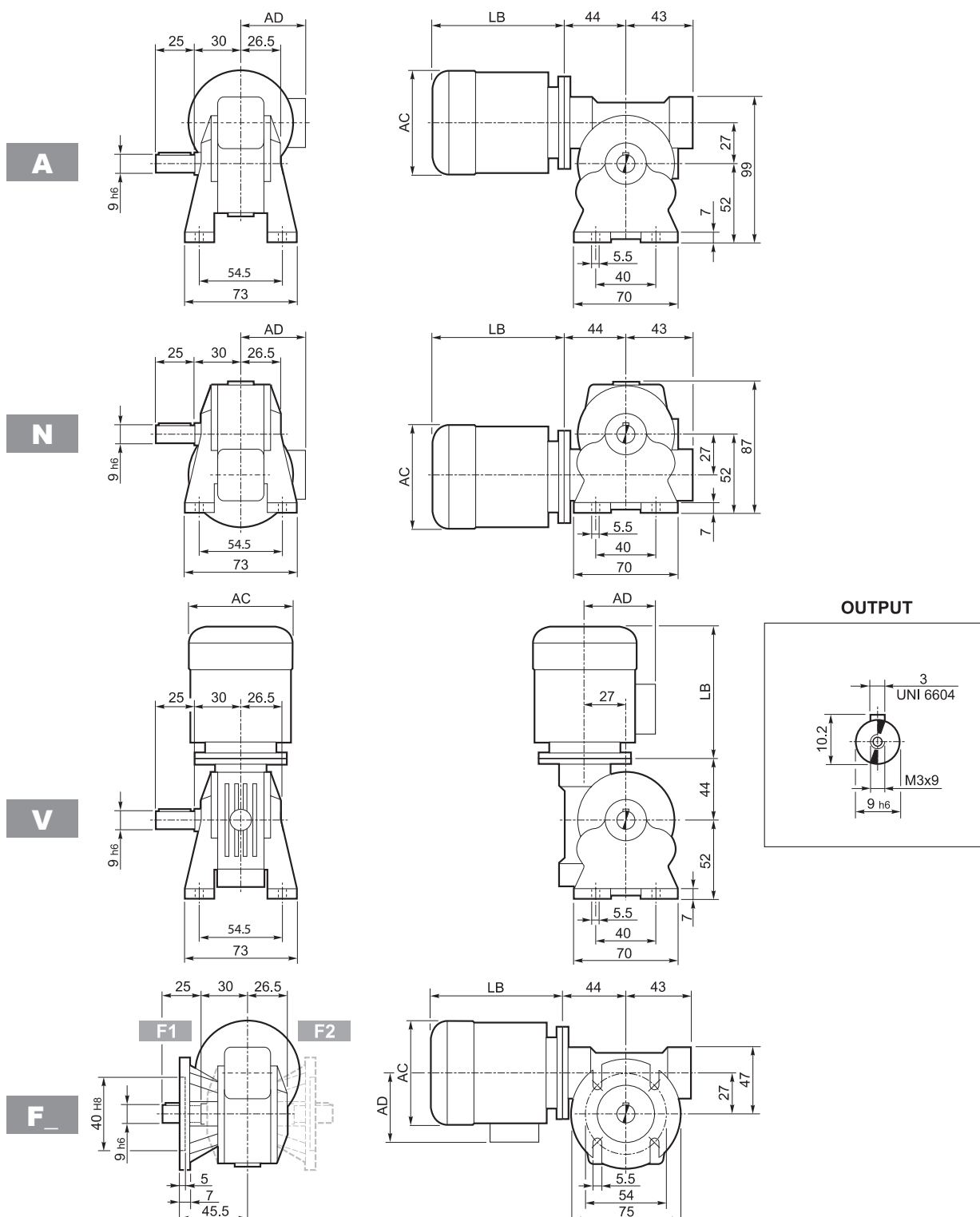
## VF 250 - VFR 250

|         |             | i   | J (•10 <sup>-4</sup> ) [kgm <sup>2</sup> ] |      |      |      |      |      |      |     |
|---------|-------------|-----|--------------------------------------------|------|------|------|------|------|------|-----|
|         |             |     | P100                                       | P112 | P132 | P160 | P180 | P200 | P225 | HS  |
| VF 250  | VF 250_7    | 7   | —                                          | —    | 620  | 620  | 620  | 620  | 620  | 620 |
|         | VF 250_10   | 10  | —                                          | —    | 387  | 387  | 387  | 387  | 387  | 387 |
|         | VF 250_15   | 15  | —                                          | —    | 266  | 266  | 266  | 266  | 266  | 266 |
|         | VF 250_20   | 20  | —                                          | —    | 242  | 242  | 242  | 242  | 242  | 242 |
|         | VF 250_30   | 30  | —                                          | —    | 184  | 184  | 184  | 184  | 184  | 184 |
|         | VF 250_40   | 40  | —                                          | —    | 241  | 241  | 241  | 241  | 241  | 241 |
|         | VF 250_50   | 50  | —                                          | —    | 240  | 240  | 240  | 240  | 240  | 240 |
|         | VF 250_60   | 60  | —                                          | —    | 158  | 158  | 158  | 158  | 158  | 158 |
|         | VF 250_80   | 80  | —                                          | —    | 160  | 160  | 160  | 160  | 160  | 160 |
|         | VF 250_100  | 100 | —                                          | —    | 149  | 149  | 149  | 149  | 149  | 149 |
| VFR 250 | VFR 250_30  | 30  | 71                                         | 71   | 71   | 70   | —    | —    | —    | 75  |
|         | VFR 250_45  | 45  | 58                                         | 58   | 57   | 57   | —    | —    | —    | 61  |
|         | VFR 250_60  | 60  | 55                                         | 55   | 55   | 54   | —    | —    | —    | 58  |
|         | VFR 250_90  | 90  | 48                                         | 48   | 48   | 48   | —    | —    | —    | 52  |
|         | VFR 250_120 | 120 | 55                                         | 55   | 54   | 54   | —    | —    | —    | 58  |
|         | VFR 250_150 | 150 | 55                                         | 55   | 54   | 54   | —    | —    | —    | 58  |
|         | VFR 250_180 | 180 | 46                                         | 46   | 45   | 45   | —    | —    | —    | 49  |
|         | VFR 250_240 | 240 | 46                                         | 46   | 45   | 45   | —    | —    | —    | 49  |
|         | VFR 250_300 | 300 | 45                                         | 45   | 44   | 44   | —    | —    | —    | 48  |

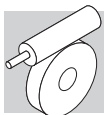


## 26 DIMENSIONI MOTORIDUTTORI E RIDUTTORI PREDISPOSTI IEC

### VF 27...BN27

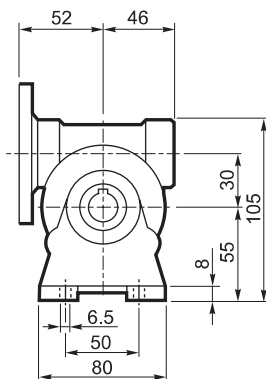
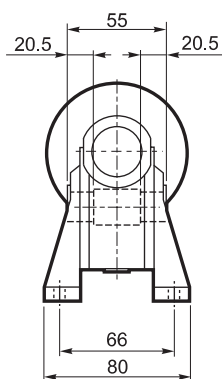


|  | P <sub>n</sub><br>kW | n<br>min <sup>-1</sup> | M <sub>n</sub><br>Nm | η<br>% | COSφ | I <sub>n</sub><br>A<br>(400V) | I <sub>s</sub><br>I <sub>n</sub> | M <sub>s</sub><br>M <sub>n</sub> | M <sub>a</sub><br>M <sub>n</sub> | J <sub>m</sub><br>(· 10 <sup>-4</sup> )<br>kgm <sup>2</sup> |  Kg | LB  | AC  | AD |
|-------------------------------------------------------------------------------------|----------------------|------------------------|----------------------|--------|------|-------------------------------|----------------------------------|----------------------------------|----------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------------|-----|-----|----|
| <b>BN 27A 4</b>                                                                     | 0.04                 | 1405                   | 0.27                 | 38.4   | 0.6  | 0.25                          | 2.9                              | 3.6                              | 3.1                              | 1.49                                                        | 3.3                                                                                      | 168 | 112 | 92 |
| <b>BN 27B 4</b>                                                                     | 0.06                 | 1340                   | 0.43                 | 46.8   | 0.65 | 0.28                          | 2.6                              | 2.3                              | 2.0                              | 1.49                                                        | 3.3                                                                                      | 168 | 112 | 92 |
| <b>BN 27C 4</b>                                                                     | 0.09                 | 1380                   | 0.63                 | 46     | 0.65 | 0.43                          | 2.8                              | 2.3                              | 1.9                              | 1.49                                                        | 3.3                                                                                      | 168 | 112 | 92 |

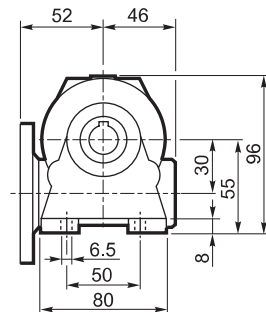
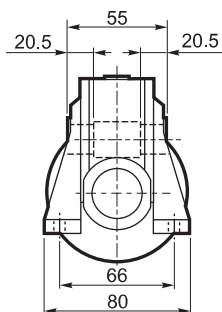


## VF 30...P (IEC)

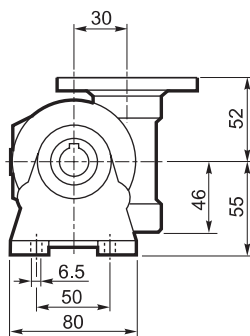
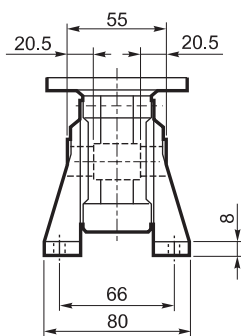
**A**



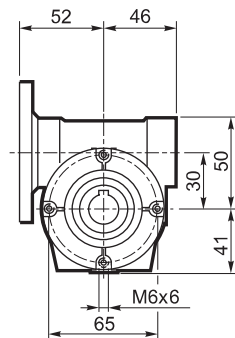
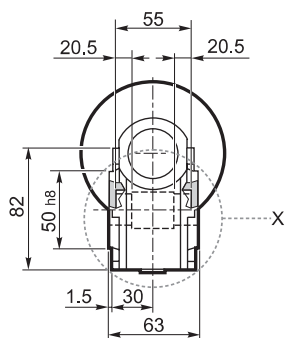
**N**



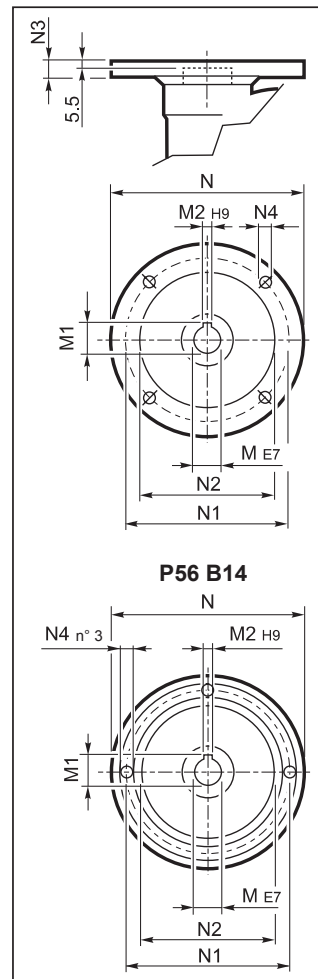
**V**



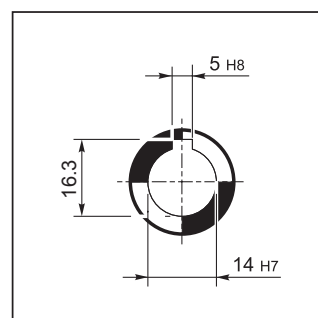
**P**



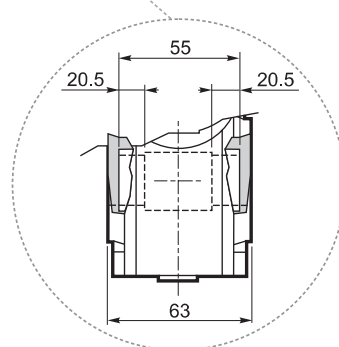
**INPUT**

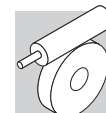


**OUTPUT**



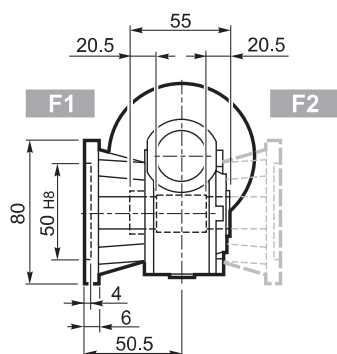
**X**



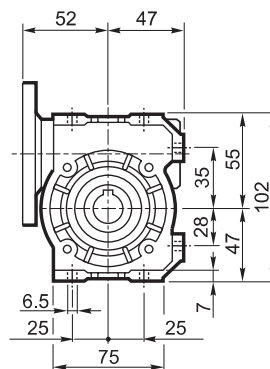
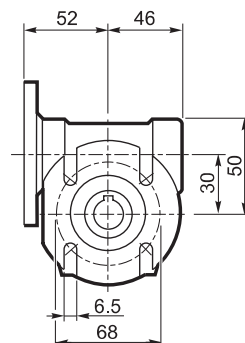
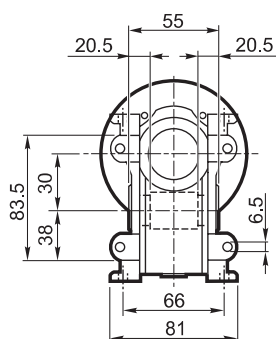


## VF 30...P (IEC)

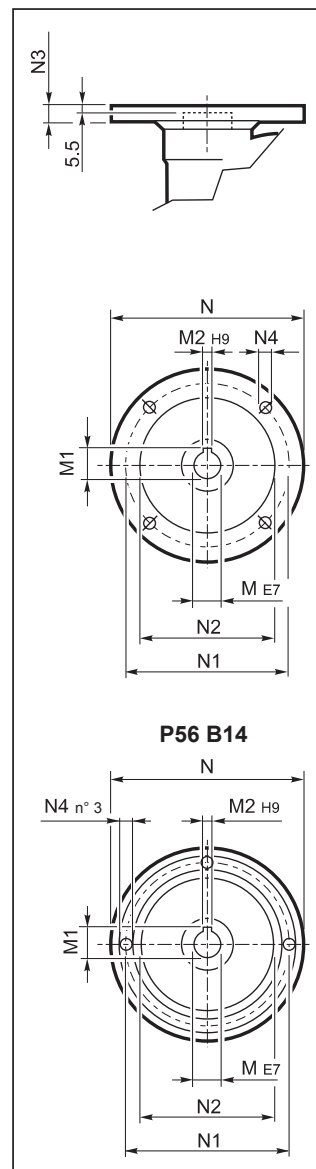
**F**



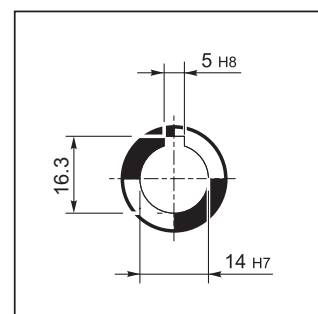
**U**



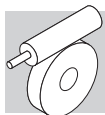
### INPUT



### OUTPUT

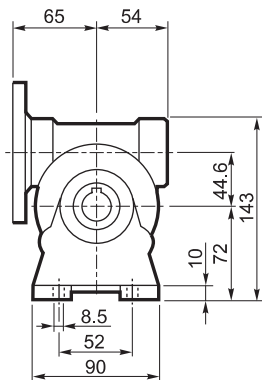
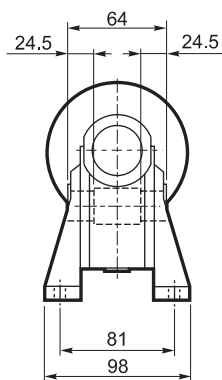


|  |  | M  | M1   | M2 | N   | N1  | N2 | N3 | N4  |  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|------|----|-----|-----|----|----|-----|---------------------------------------------------------------------------------------|
| VF 30                                                                               | P56 B5                                                                              | 9  | 10.4 | 3  | 120 | 100 | 80 | 7  | 7   | 1.1                                                                                   |
| VF 30                                                                               | P56 B14                                                                             | 9  | 10.4 | 3  | 80  | 65  | 50 | 7  | 5.5 |                                                                                       |
| VF 30                                                                               | P63 B5                                                                              | 11 | 12.8 | 4  | 140 | 115 | 95 | 8  | 9.5 |                                                                                       |
| VF 30                                                                               | P63 B14                                                                             | 11 | 12.8 | 4  | 90  | 75  | 60 | 6  | 5.5 |                                                                                       |

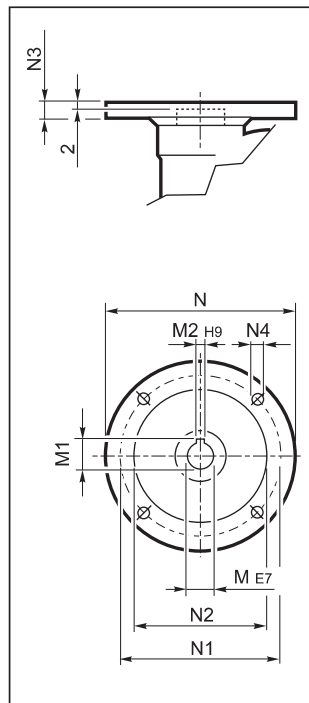


## VF 44...P (IEC)

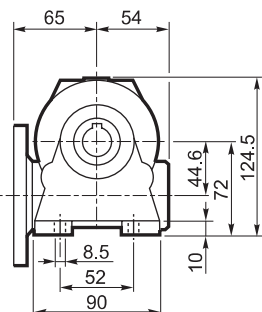
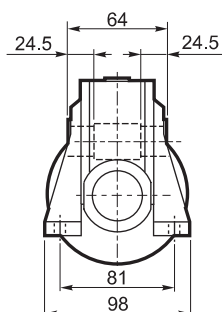
**A**



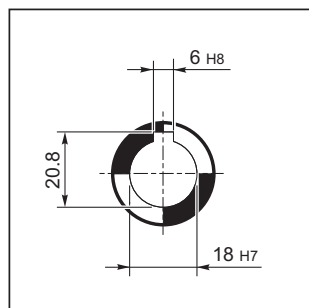
**INPUT**



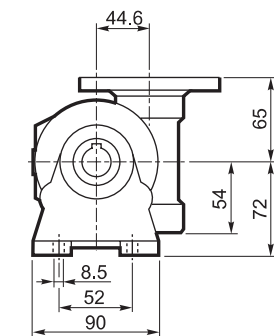
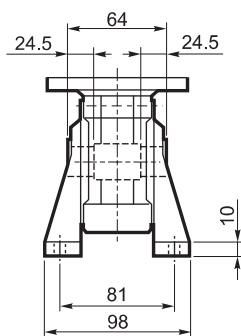
**N**



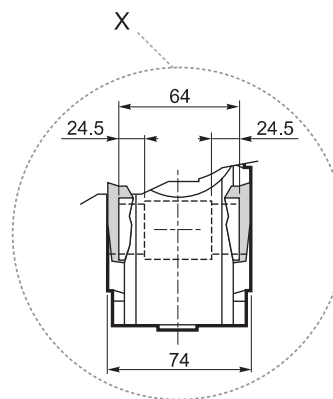
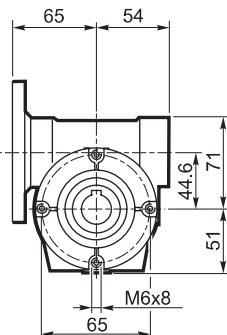
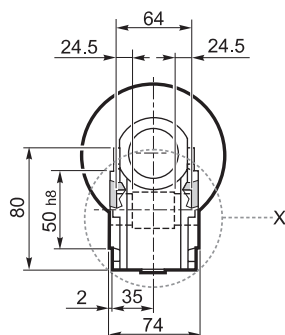
**OUTPUT**

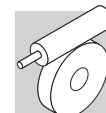


**V**

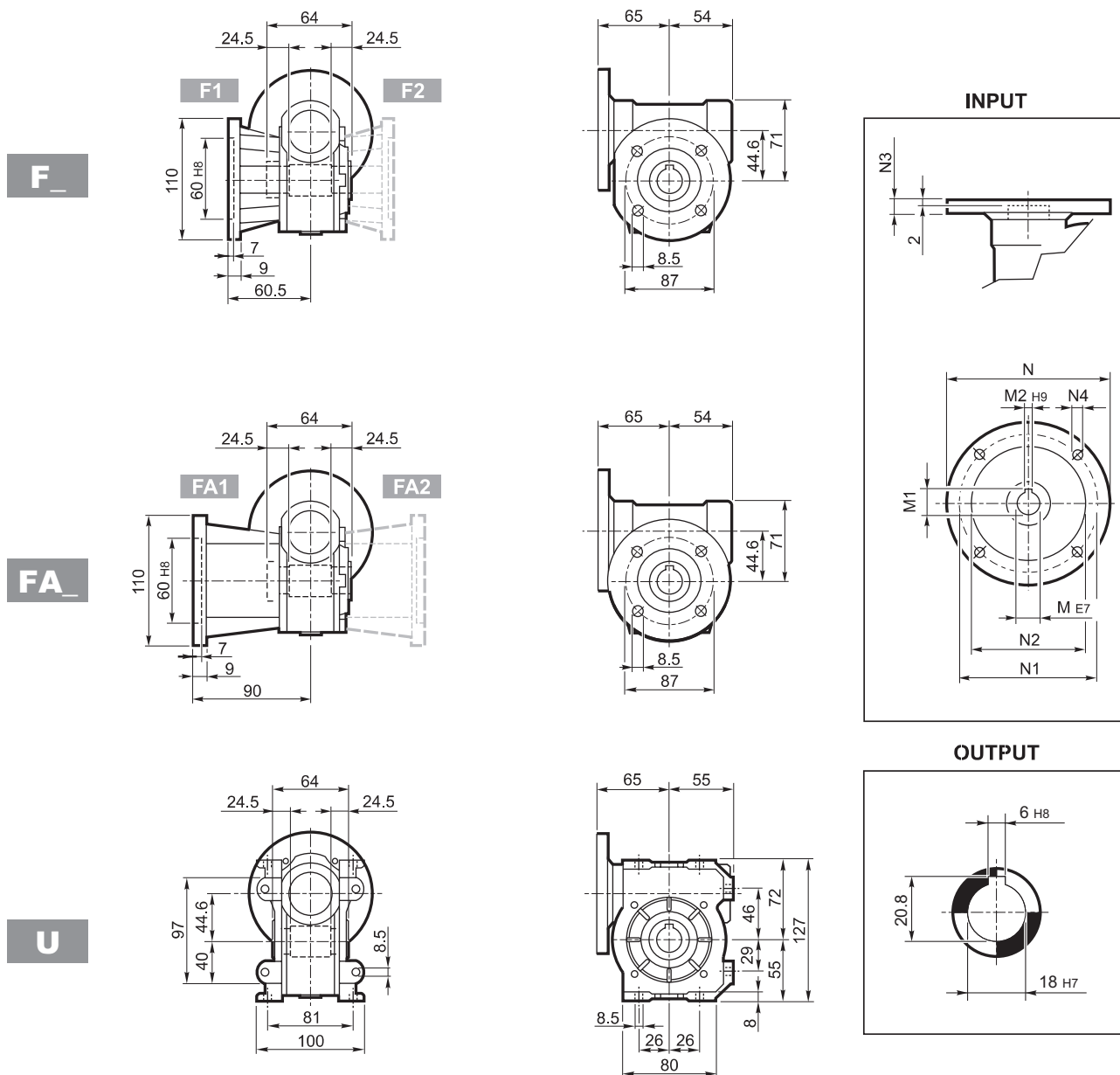


**P**

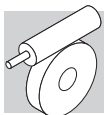




## VF 44...P (IEC)

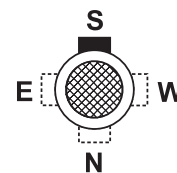
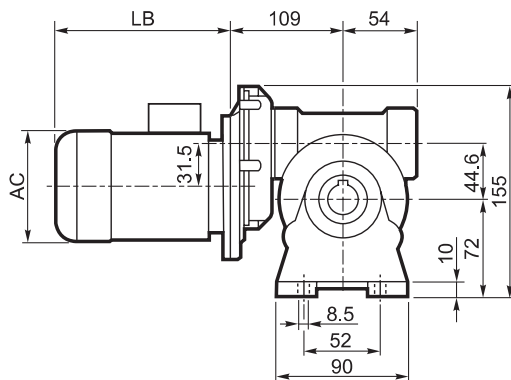
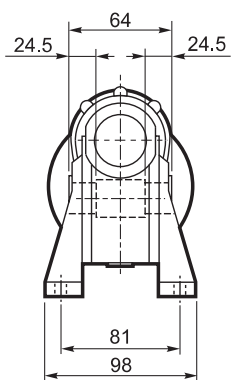


|       |         | M  | M1   | M2 | N   | N1  | N2  | N3 | N4  | Kg  |
|-------|---------|----|------|----|-----|-----|-----|----|-----|-----|
| VF 44 | P63 B5  | 11 | 12.8 | 4  | 140 | 115 | 95  | 10 | 9.5 | 2.0 |
| VF 44 | P71 B5  | 14 | 16.3 | 5  | 160 | 130 | 110 | 10 | 9.5 |     |
| VF 44 | P63 B14 | 11 | 12.8 | 4  | 90  | 75  | 60  | 8  | 5.5 |     |
| VF 44 | P71 B14 | 14 | 16.3 | 5  | 105 | 85  | 70  | 10 | 7   |     |

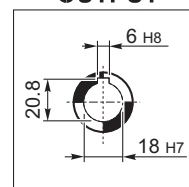


## VFR 44...BN 44

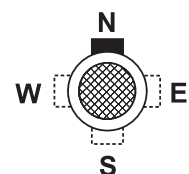
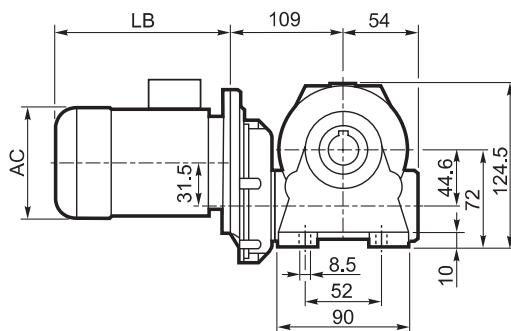
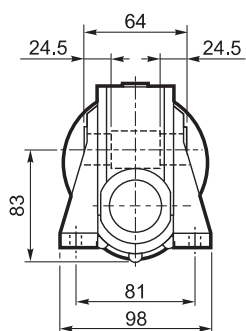
**A**



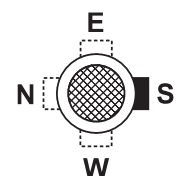
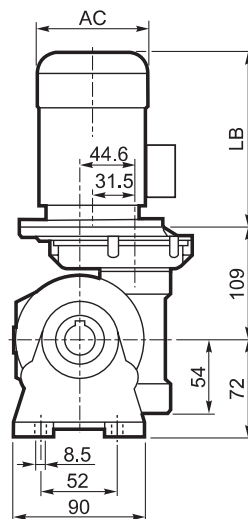
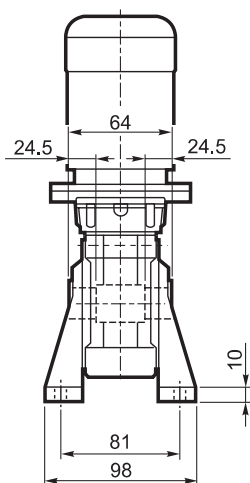
**OUTPUT**



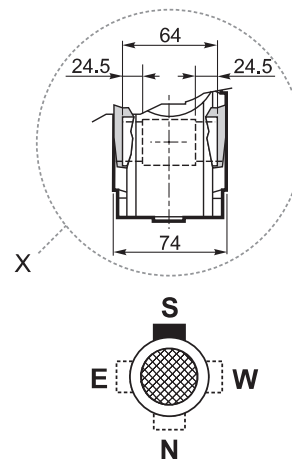
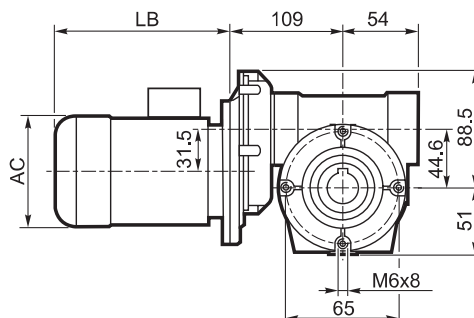
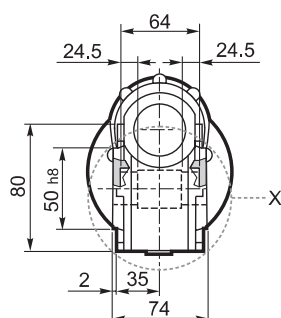
**N**

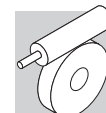


**V**



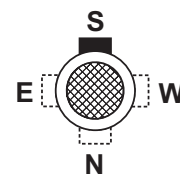
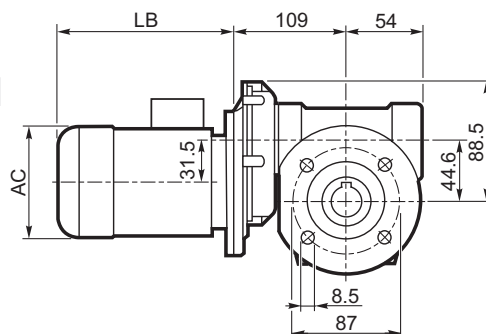
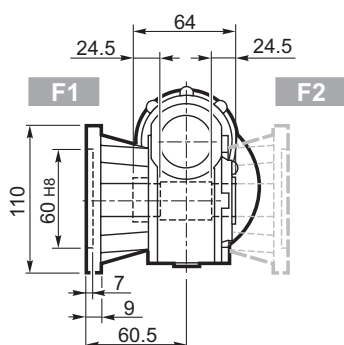
**P**



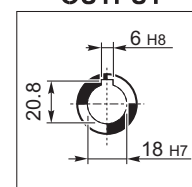


## VFR 44...BN 44

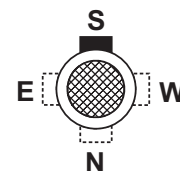
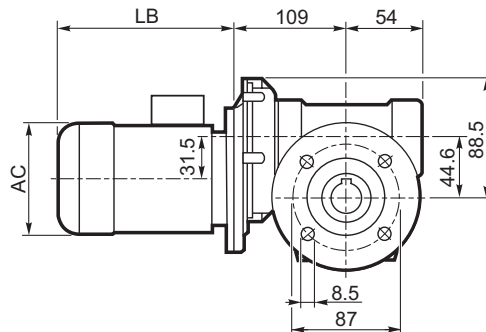
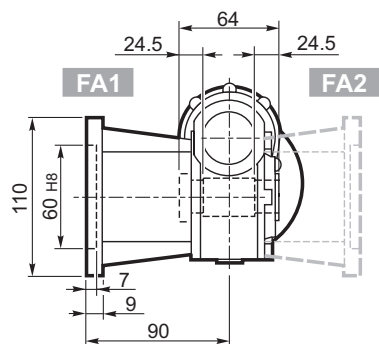
**F\_**



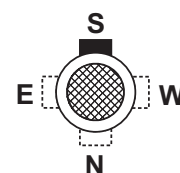
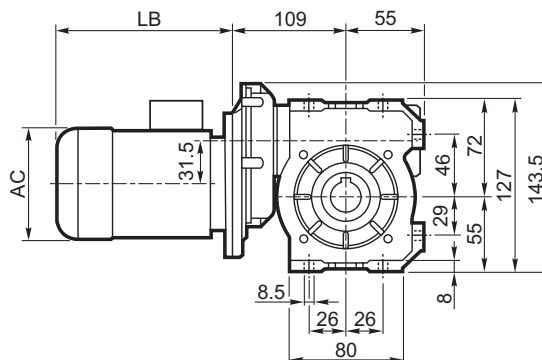
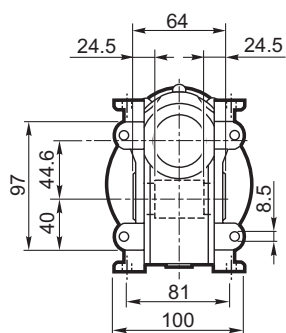
**OUTPUT**



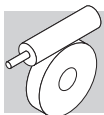
**FA\_**



**U**

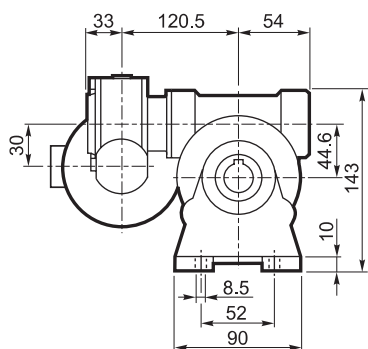


|  | <b>P<sub>n</sub></b><br>kW | <b>n</b><br>min <sup>-1</sup> | <b>M<sub>n</sub></b><br>Nm | <b>η</b><br>% | <b>COSφ</b> | <b>I<sub>n</sub></b><br>A<br>(400V) | <b>I<sub>s</sub></b><br>I <sub>n</sub> | <b>M<sub>s</sub></b><br>M <sub>n</sub> | <b>M<sub>a</sub></b><br>M <sub>n</sub> | <b>J<sub>m</sub></b><br>(·10 <sup>-4</sup> )<br>kgm <sup>2</sup> |  | <b>LB</b> | <b>AC</b> | <b>AD</b> |
|-------------------------------------------------------------------------------------|----------------------------|-------------------------------|----------------------------|---------------|-------------|-------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------|-----------|-----------|
| <b>BN 44B4</b>                                                                      | 0.06                       | 1380                          | 0.42                       | 40            | 0.58        | 0.38                                | 2.4                                    | 2.3                                    | 1.9                                    | 1.22                                                             | 4.7                                                                                   | 168       | 112       | 94        |
| <b>BN 44C4</b>                                                                      | 0.09                       | 1380                          | 0.63                       | 46            | 0.65        | 0.43                                | 2.8                                    | 2.3                                    | 2                                      | 1.49                                                             | 4.6                                                                                   | 168       | 112       | 94        |

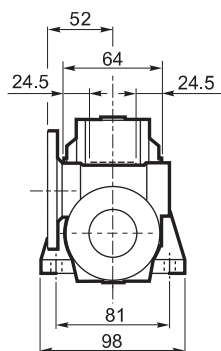


## VF/VF 30/44...P (IEC)

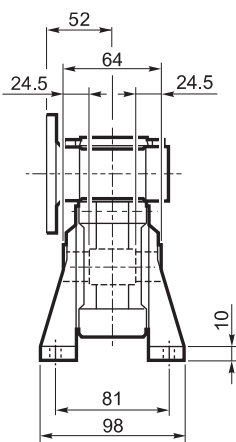
**A**



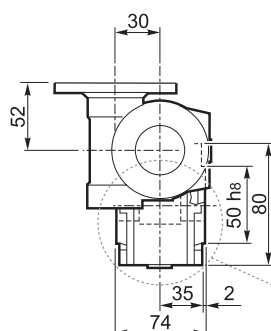
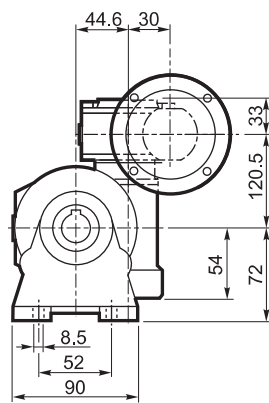
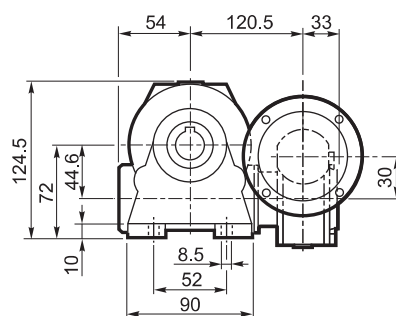
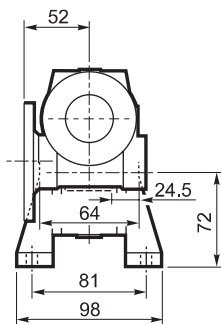
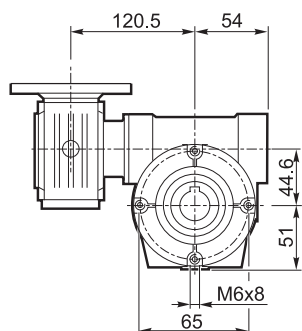
**N**



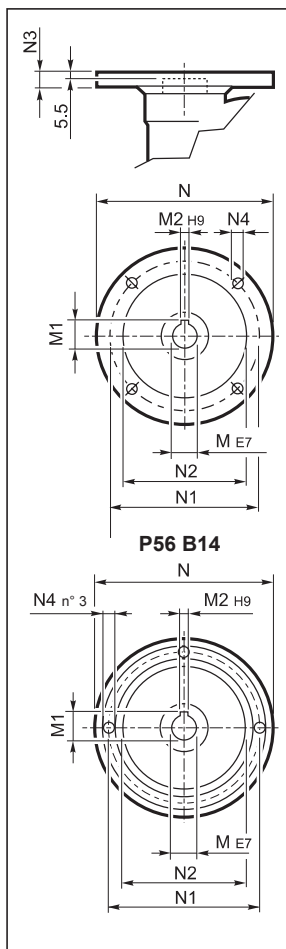
**V**



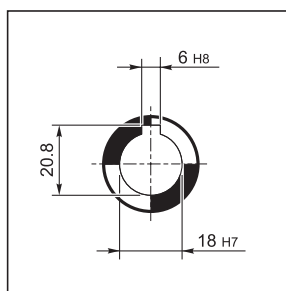
**P**

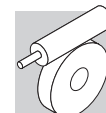


**INPUT**



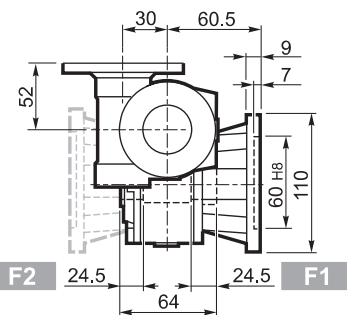
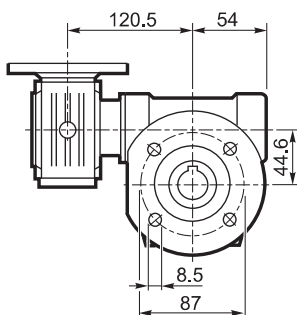
**OUTPUT**



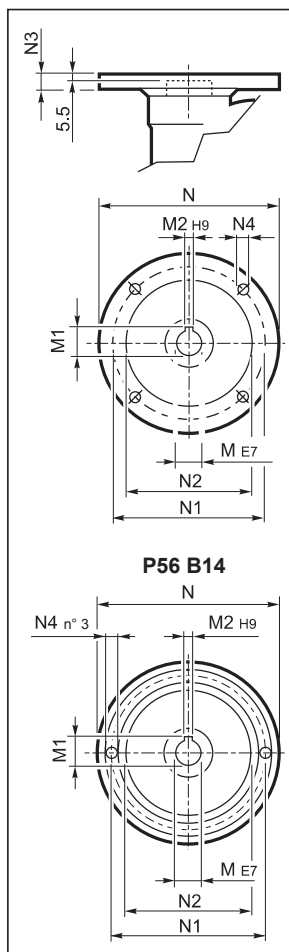


## VF/VF 30/44...P (IEC)

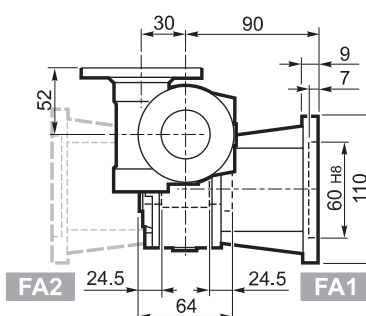
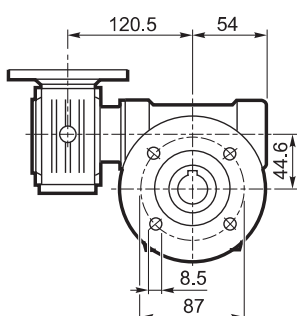
**F**



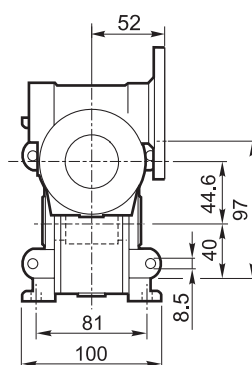
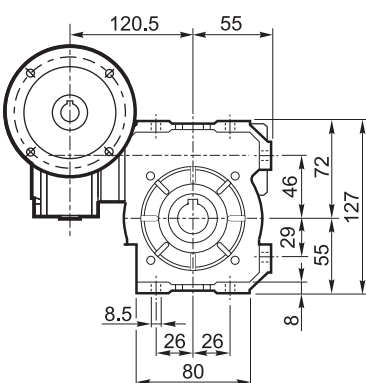
**INPUT**



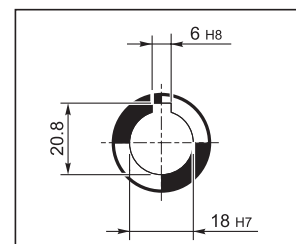
**FA**



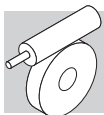
**U**



**OUTPUT**

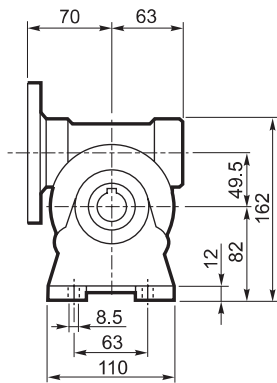
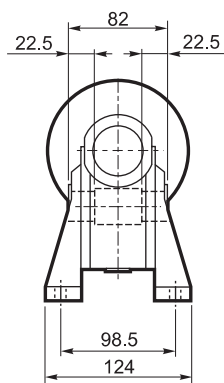


|             |         | M  | M1   | M2 | N  | N1 | N2 | N3 | N4  |     |
|-------------|---------|----|------|----|----|----|----|----|-----|-----|
| VF/VF 30/44 | P56 B14 | 9  | 10.4 | 3  | 80 | 65 | 50 | 7  | 5.5 | 3.5 |
| VF/VF 30/44 | P63 B14 | 11 | 12.8 | 4  | 90 | 75 | 60 | 6  | 5.5 |     |

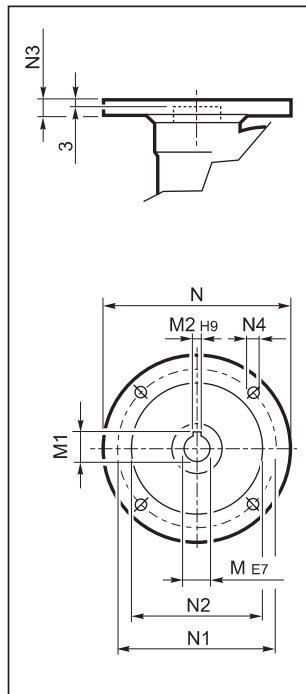


## VF 49...P (IEC)

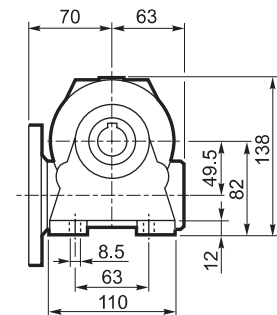
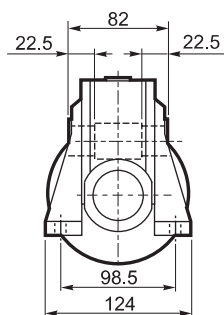
**A**



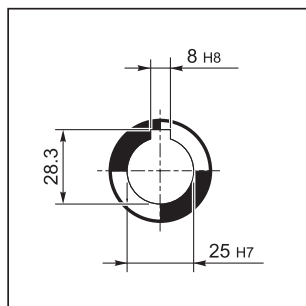
**INPUT**



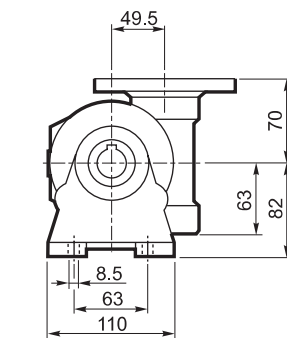
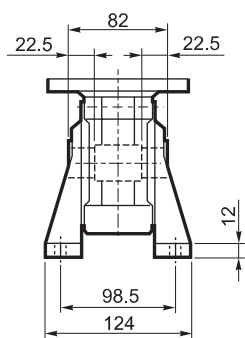
**N**



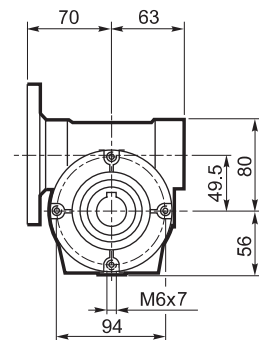
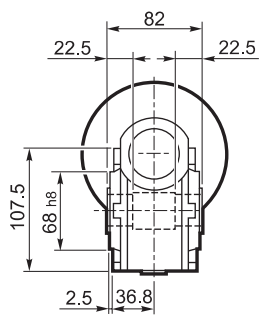
**OUTPUT**

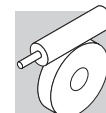


**V**



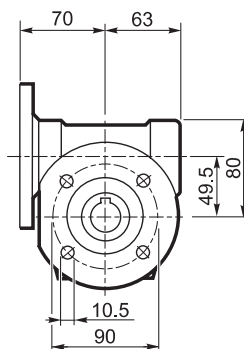
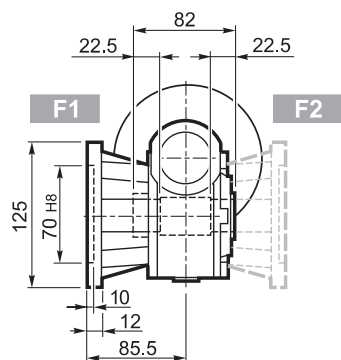
**P**



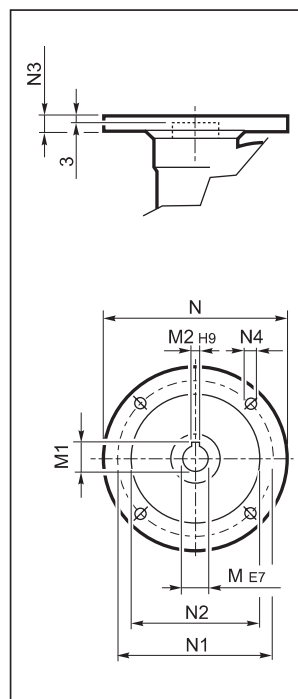


## VF 49...P (IEC)

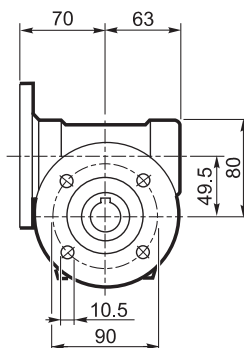
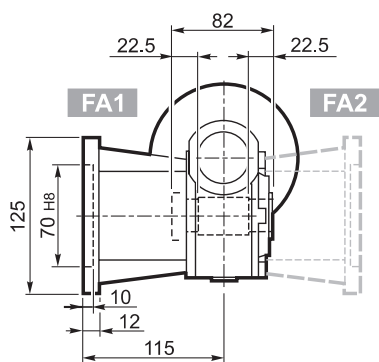
**F**



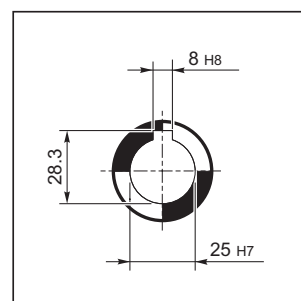
**INPUT**



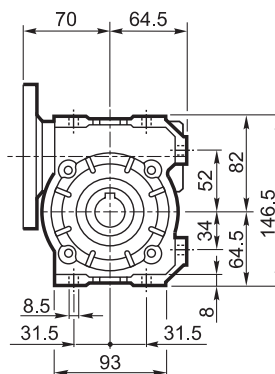
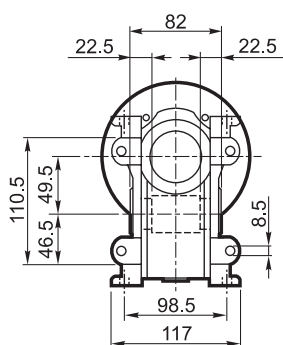
**FA**



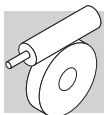
**OUTPUT**



**U**

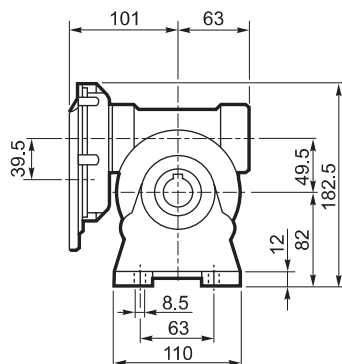
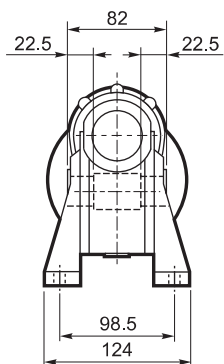


|                                                                                     |                                                                                     | M  | M1   | M2 | N   | N1  | N2  | N3   | N4   | kg  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|------|----|-----|-----|-----|------|------|-----|
|  |  |    |      |    |     |     |     |      |      |     |
| VF 49                                                                               | P63 B5                                                                              | 11 | 12.8 | 4  | 140 | 115 | 95  | 10.5 | 9.5  | 3.0 |
| VF 49                                                                               | P71 B5                                                                              | 14 | 16.3 | 5  | 160 | 130 | 110 | 10.5 | 9.5  |     |
| VF 49                                                                               | P80 B5                                                                              | 19 | 21.8 | 6  | 200 | 165 | 130 | 10   | 11.5 |     |
| VF 49                                                                               | P63 B14                                                                             | 11 | 12.8 | 4  | 90  | 75  | 60  | 7    | 6    |     |
| VF 49                                                                               | P71 B14                                                                             | 14 | 16.3 | 5  | 105 | 85  | 70  | 10.5 | 6.5  |     |
| VF 49                                                                               | P80 B14                                                                             | 19 | 21.8 | 6  | 120 | 100 | 80  | 10   | 7    |     |

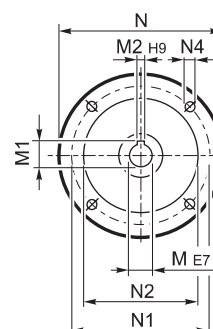
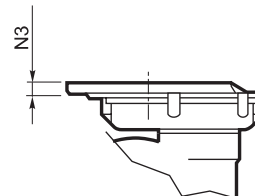


## VFR 49...P (IEC)

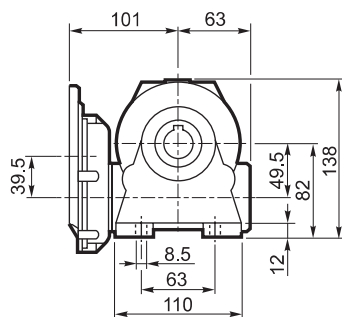
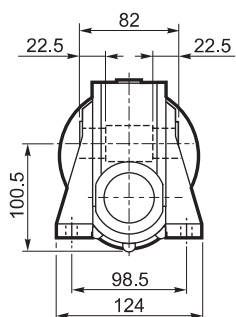
**A**



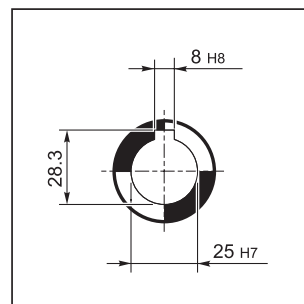
**INPUT**



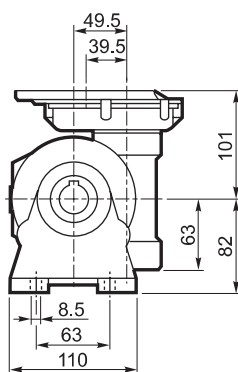
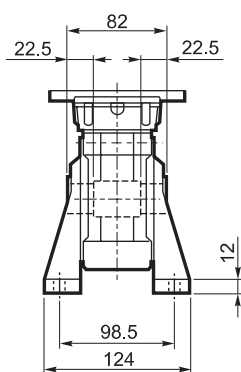
**N**



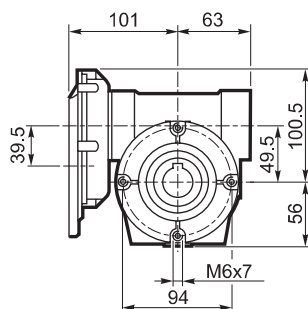
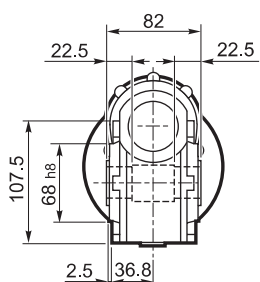
**OUTPUT**

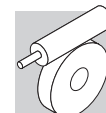


**V**

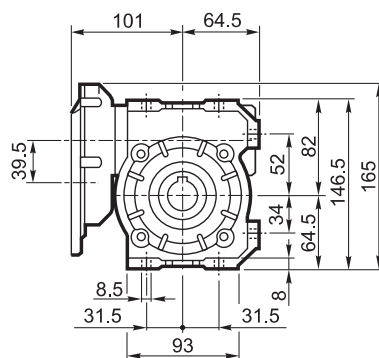
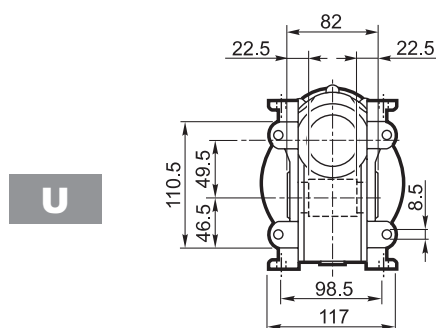
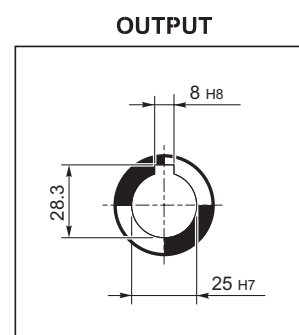
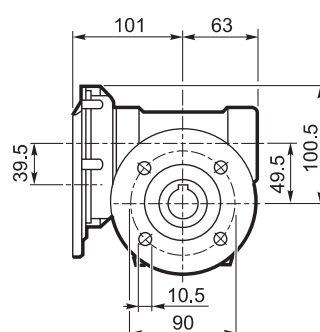
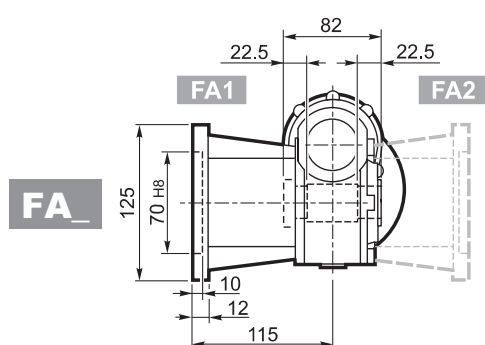
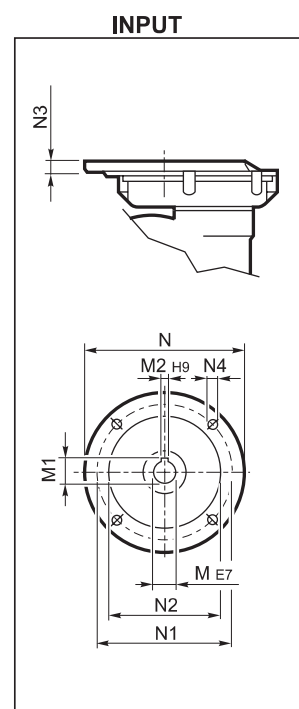
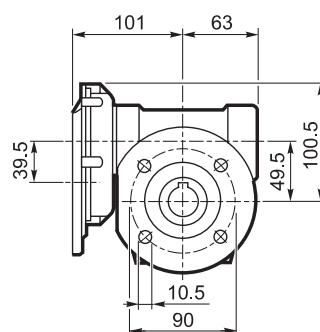
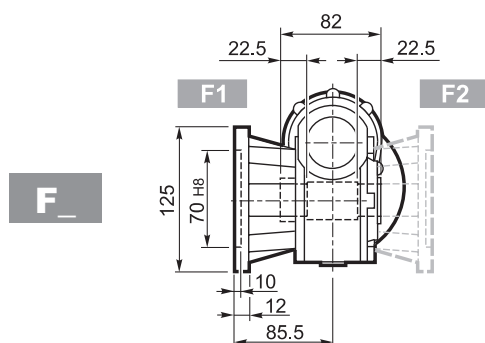


**P**

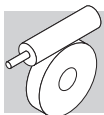




## VFR 49...P (IEC)

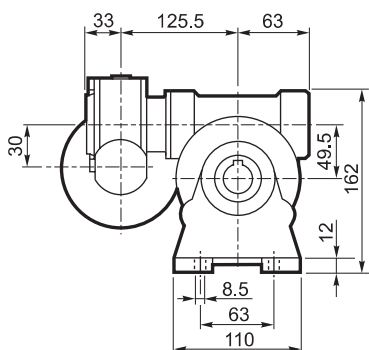


|  |  | M  | M1   | M2 | N   | N1  | N2 | N3 | N4      |  Kg |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|------|----|-----|-----|----|----|---------|------------------------------------------------------------------------------------------|
| VFR 49                                                                              | P63 B5                                                                              | 11 | 12.8 | 4  | 140 | 115 | 95 | 11 | M8 x 19 | 5.0                                                                                      |

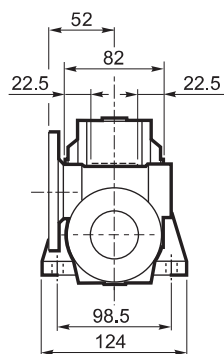


## VF/VF 30/49...P (IEC)

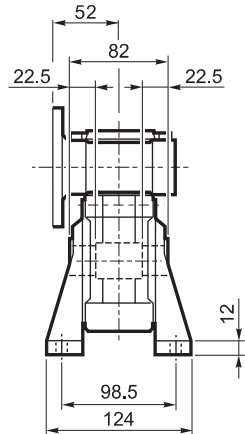
**A**



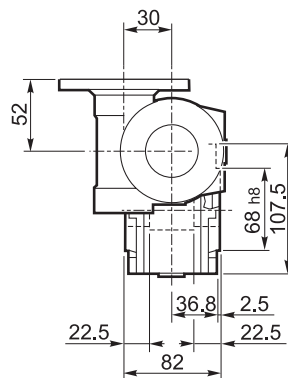
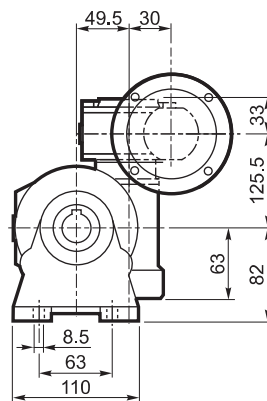
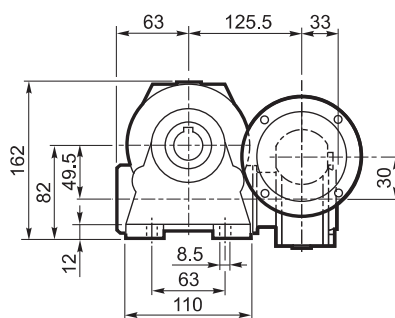
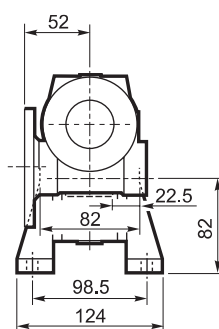
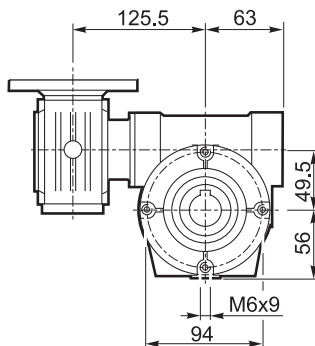
**N**



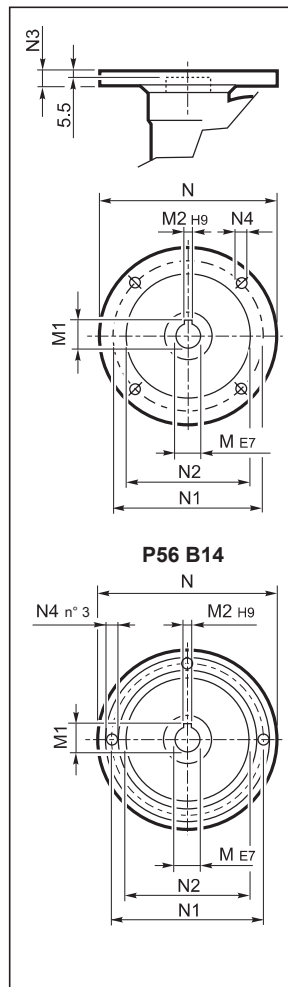
**V**



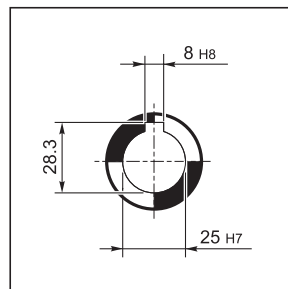
**P**

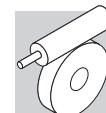


**INPUT**



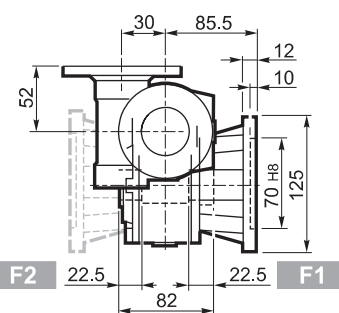
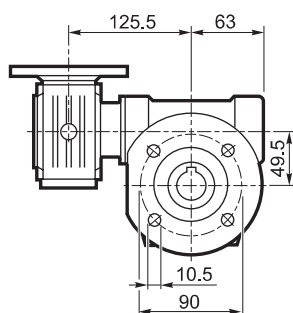
**OUTPUT**



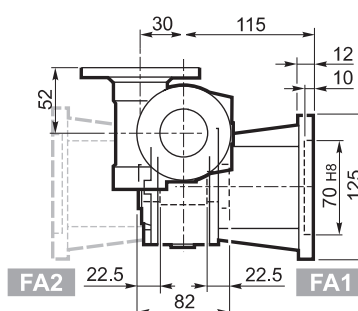
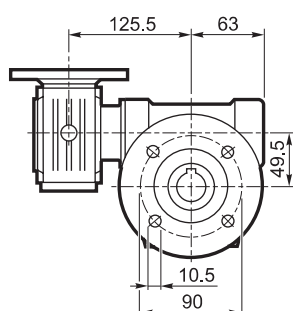


## VF/VF 30/49...P (IEC)

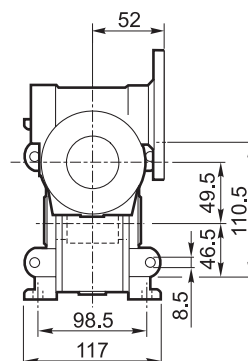
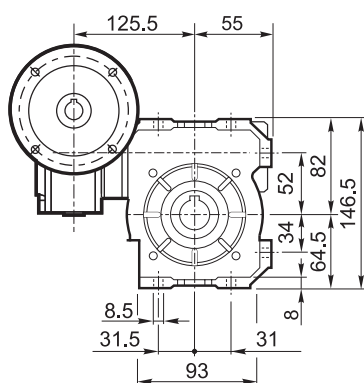
**F**



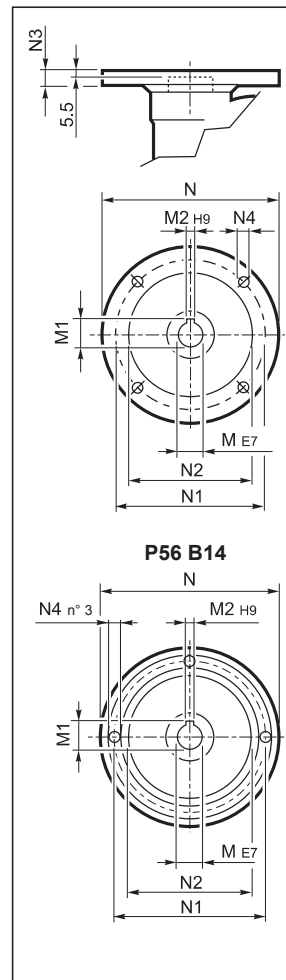
**FA**



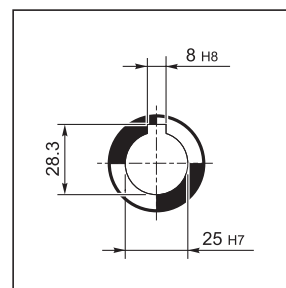
**U**



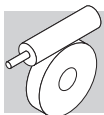
**INPUT**



**OUTPUT**

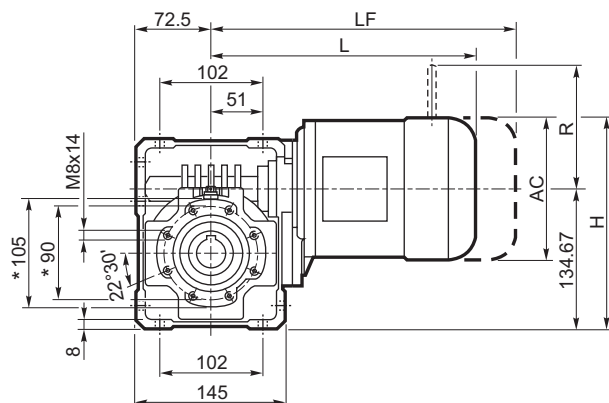


|             |         | M  | M1   | M2 | N  | N1 | N2 | N3 | N4  | Kg  |
|-------------|---------|----|------|----|----|----|----|----|-----|-----|
| VF/VF 30/49 | P56 B14 | 9  | 10.4 | 3  | 80 | 65 | 50 | 7  | 5.5 | 4.5 |
| VF/VF 30/49 | P63 B14 | 11 | 12.8 | 4  | 90 | 75 | 60 | 6  | 5.5 |     |

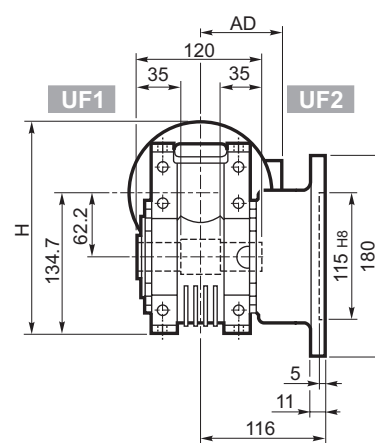
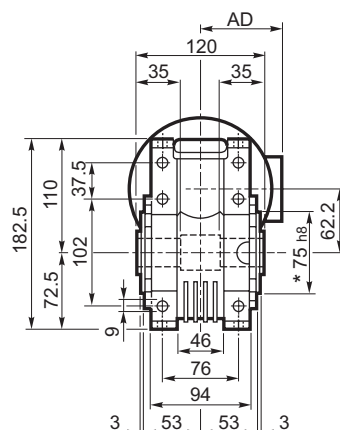
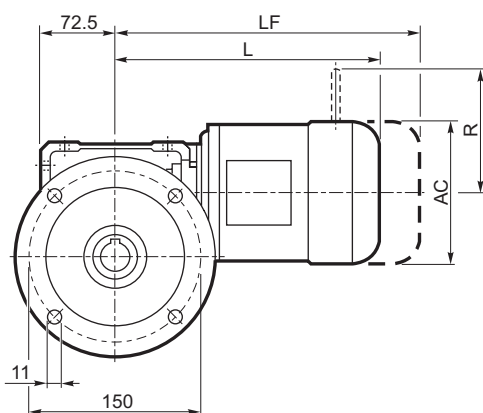


## W 63...M

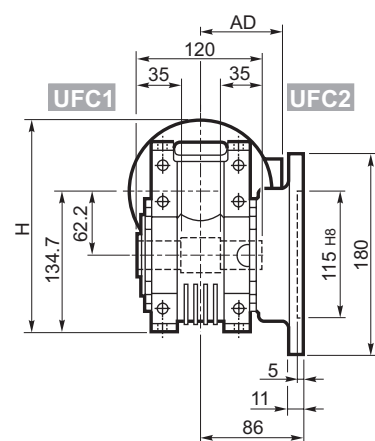
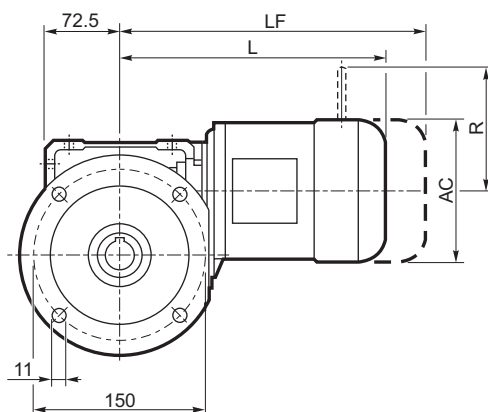
**U**



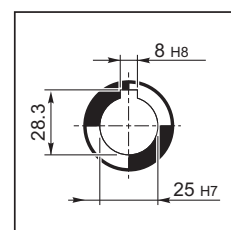
**UF\_**



**UFC\_**

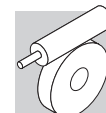


### OUTPUT

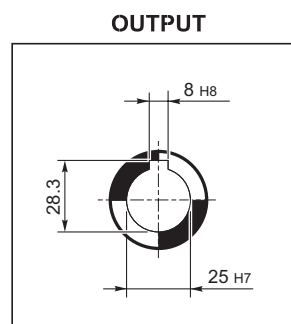
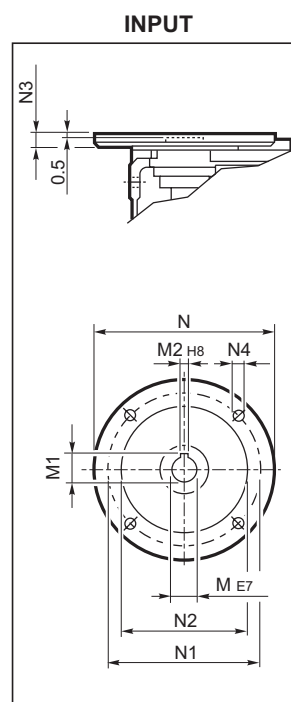
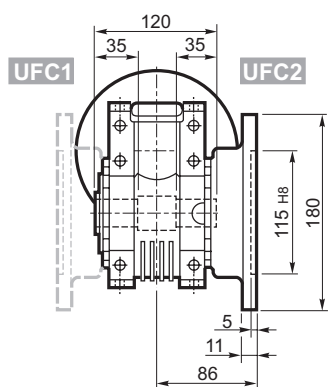
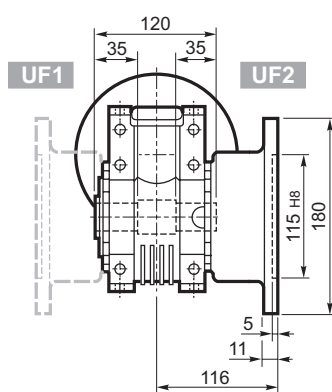
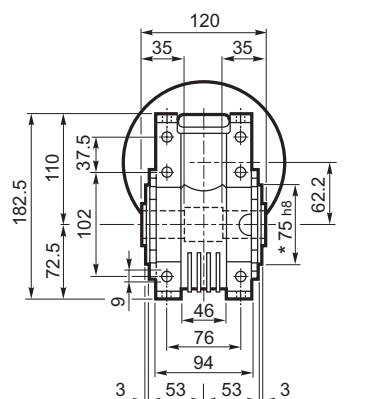
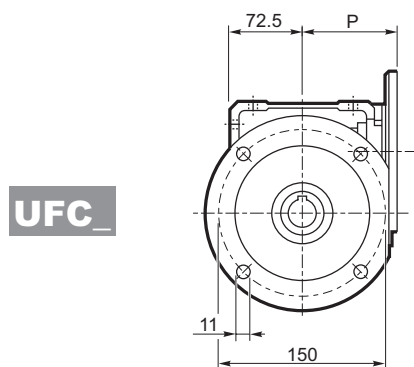
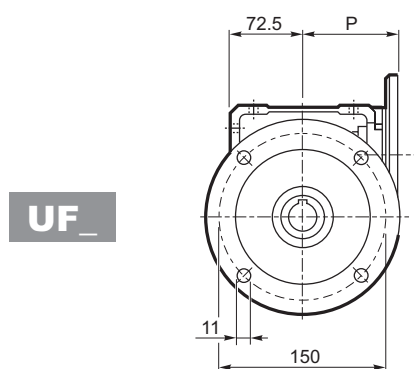
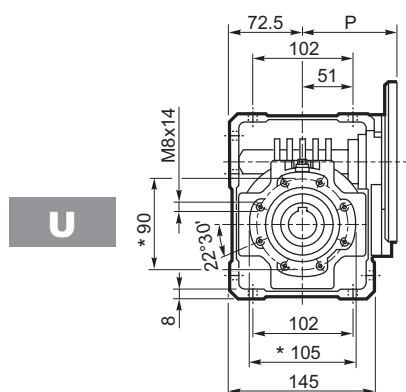


|      |    |     | M_  |     |     |     |    | M...FD<br>M...FA |    | M...FD |     | M...FA |     |
|------|----|-----|-----|-----|-----|-----|----|------------------|----|--------|-----|--------|-----|
|      |    |     | AC  | H   | L   | AD  | Kg | LF               | Kg | R      | AD  | R      | AD  |
| W 63 | S1 | M1  | 138 | 204 | 289 | 108 | 13 | 350              | 15 | 103    | 135 | 124    | 108 |
| W 63 | S2 | M2S | 156 | 213 | 317 | 119 | 17 | 393              | 20 | 129    | 146 | 134    | 119 |

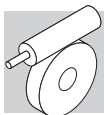
\* Da ambo i lati



## W 63...P (IEC)

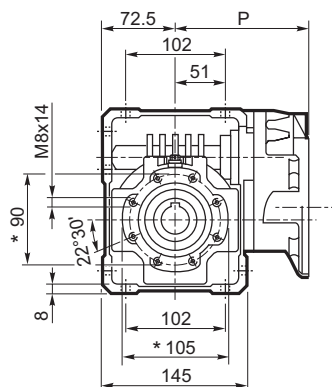


|      |         | M  | M1   | M2 | N   | N1  | N2  | N3 | N4   | P   | Kg  |
|------|---------|----|------|----|-----|-----|-----|----|------|-----|-----|
|      |         |    |      |    |     |     |     |    |      |     |     |
| W 63 | P71 B5  | 14 | 16.3 | 5  | 160 | 130 | 110 | 11 | 9    | 95  | 6.3 |
| W 63 | P80 B5  | 19 | 21.8 | 6  | 200 | 165 | 130 | 12 | 11.5 | 102 | 6.5 |
| W 63 | P90 B5  | 24 | 27.3 | 8  | 200 | 165 | 130 | 12 | 11.5 | 102 | 6.4 |
| W 63 | P71 B14 | 14 | 16.3 | 5  | 105 | 85  | 70  | 11 | 6.5  | 95  | 6.1 |
| W 63 | P80 B14 | 19 | 21.8 | 6  | 120 | 100 | 80  | 11 | 6.5  | 102 | 6.3 |
| W 63 | P90 B14 | 24 | 27.3 | 8  | 140 | 115 | 95  | 11 | 8.5  | 102 | 6.3 |

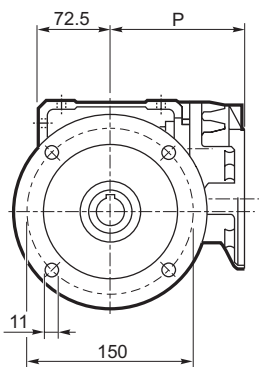


## WR 63...P (IEC)

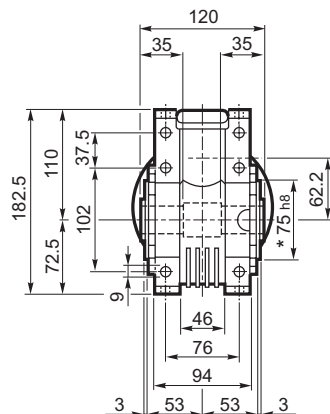
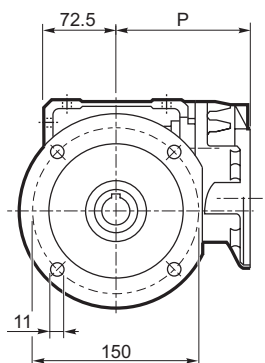
**U**



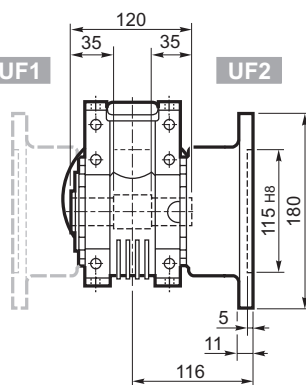
**UF**



**UFC**

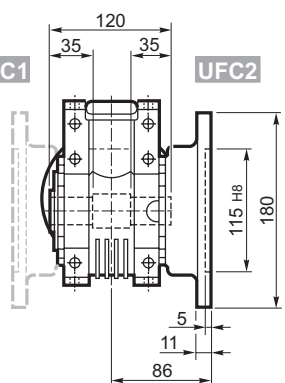


**UF1**



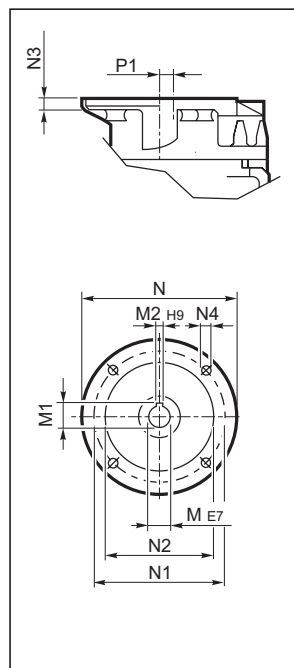
**UF2**

**UFC1**

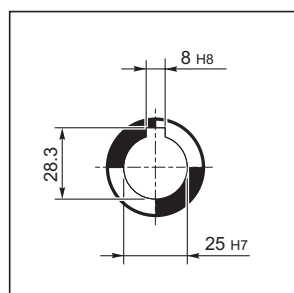


**UFC2**

**INPUT**

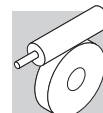


**OUTPUT**



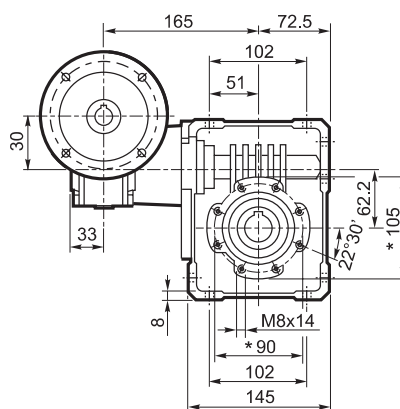
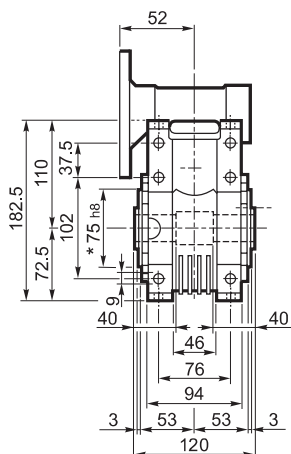
|              |               | M  | M1   | M2 | N   | N1  | N2  | N3 | N4    | P     | P1    | kg  |
|--------------|---------------|----|------|----|-----|-----|-----|----|-------|-------|-------|-----|
|              |               |    |      |    |     |     |     |    |       |       |       |     |
| <b>WR 63</b> | <b>P63 B5</b> | 11 | 12.8 | 4  | 140 | 115 | 95  | 10 | M8x10 | 133.5 | 11.42 | 7.1 |
| <b>WR 63</b> | <b>P71 B5</b> | 14 | 16.3 | 5  | 160 | 130 | 110 | 10 | M8x10 | 133.5 | 11.42 |     |

\* Da ambo i lati

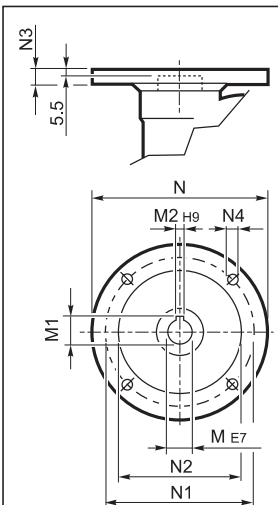


## VF/W 30/63...P (IEC)

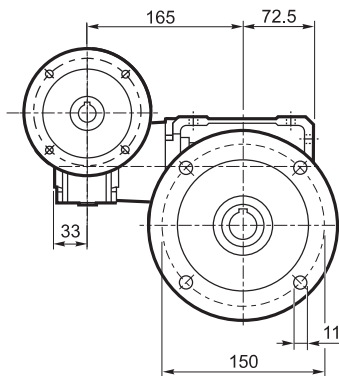
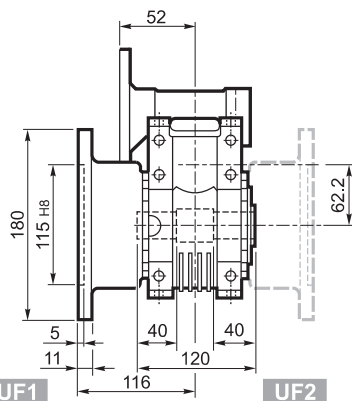
**U**



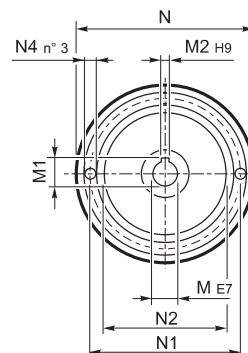
**INPUT**



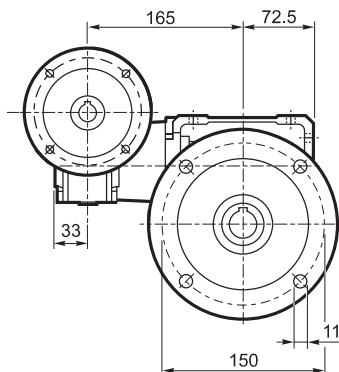
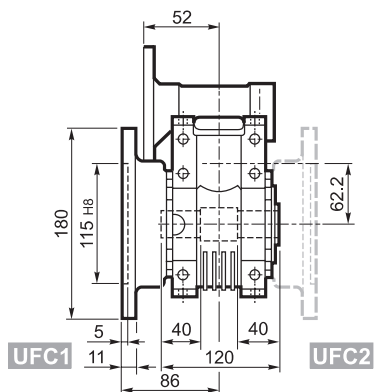
**UF**



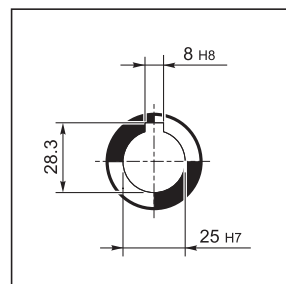
**P56 B14**



**UFC**

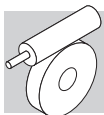


**OUTPUT**



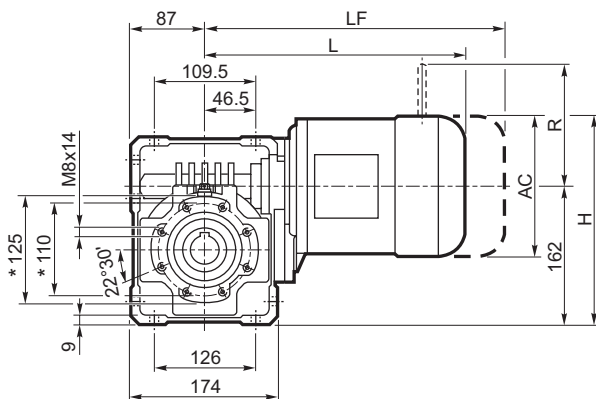
|            |         | M  | M1   | M2 | N   | N1  | N2 | N3 | N4  | Kg  |
|------------|---------|----|------|----|-----|-----|----|----|-----|-----|
|            |         |    |      |    |     |     |    |    |     |     |
| VF/W 30/63 | P56 B5  | 9  | 10.4 | 3  | 120 | 100 | 80 | 7  | 7   | 8.0 |
| VF/W 30/63 | P63 B5  | 11 | 12.8 | 4  | 140 | 115 | 95 | 8  | 9.5 |     |
| VF/W 30/63 | P56 B14 | 9  | 10.4 | 3  | 80  | 65  | 50 | 7  | 5.5 |     |
| VF/W 30/63 | P63 B14 | 11 | 12.8 | 4  | 90  | 75  | 60 | 6  | 5.5 |     |

\* Da ambo i lati

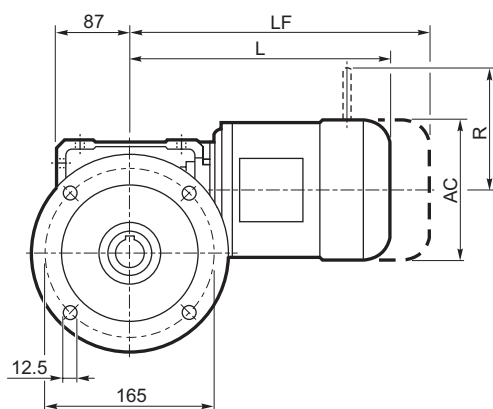


## W 75...M

**U**

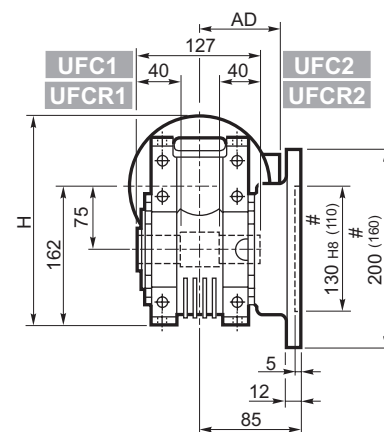
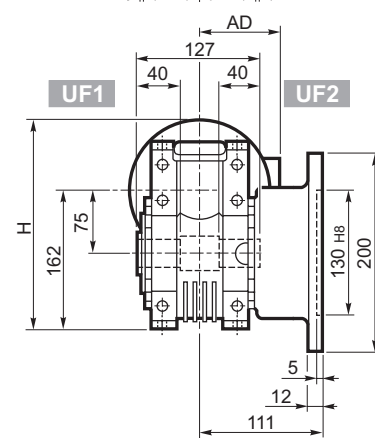
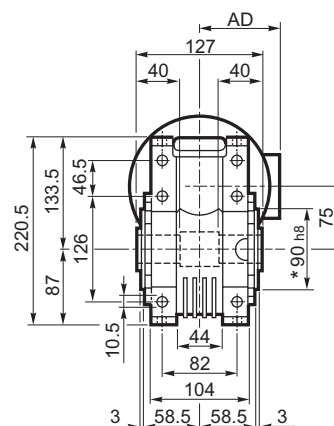
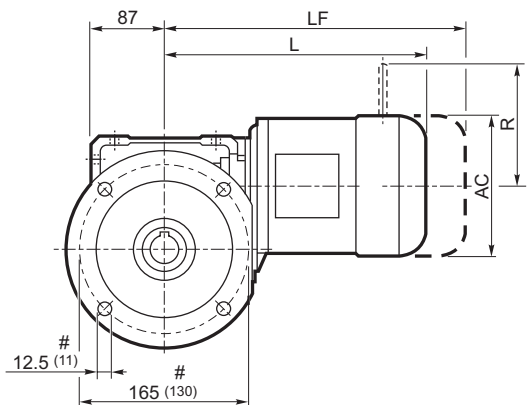


**UF\_**

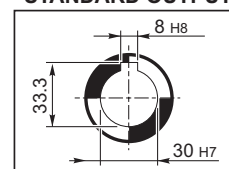


**UFC\_**

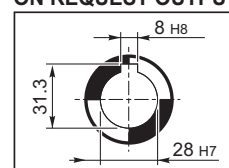
**UFCR\_#**



### STANDARD OUTPUT



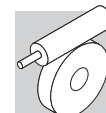
### ON REQUEST OUTPUT



|                                                                                     |                                                                                     |                                                                                     | M_  |       |     |     |                                                                                     | M...FD<br>M...FA |                                                                                     | M...FD |     | M...FA |     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|-------|-----|-----|-------------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------------|--------|-----|--------|-----|
|  |  |  | AC  | H     | L   | AD  |  | LF               |  | R      | AD  | R      | AD  |
| W 75                                                                                | S1                                                                                  | M1                                                                                  | 138 | 231   | 308 | 108 | 16.0                                                                                | 369              | 18.2                                                                                | 103    | 135 | 124    | 108 |
| W 75                                                                                | S2                                                                                  | M2S                                                                                 | 153 | 240   | 333 | 119 | 18.5                                                                                | 409              | 21.6                                                                                | 129    | 146 | 134    | 119 |
| W 75                                                                                | S3                                                                                  | M3S                                                                                 | 193 | 258.5 | 376 | 142 | 25.6                                                                                | 472              | 31                                                                                  | 160    | 158 | 160    | 142 |
| W 75                                                                                | S3                                                                                  | M3L                                                                                 | 193 | 258.5 | 408 | 142 | 28.6                                                                                | 499              | 34                                                                                  | 160    | 158 | 160    | 142 |

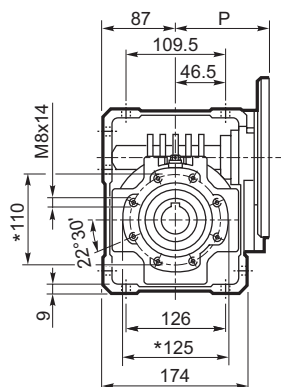
\* Da ambo i lati

# Flangia ridotta

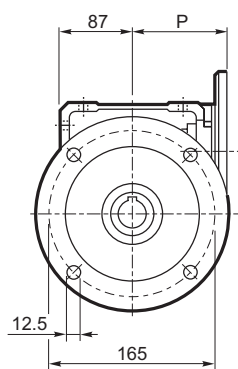


## W 75...P (IEC)

**U**

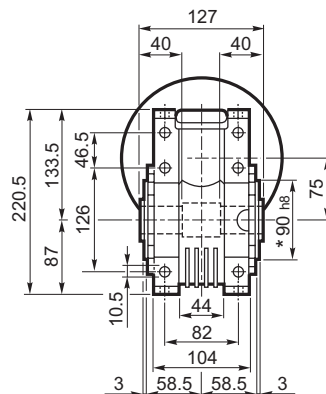
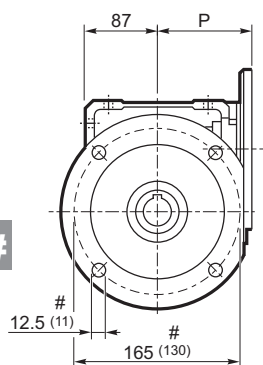


**UF\_**



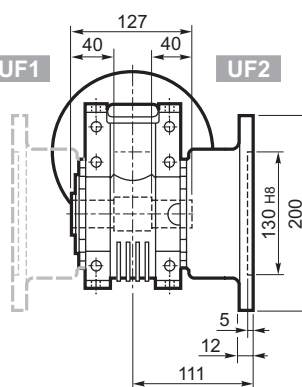
**UFC\_**

**UFCR #**



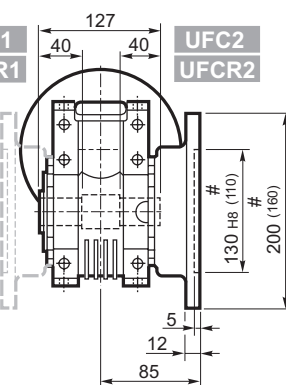
**UF1**

**UF2**

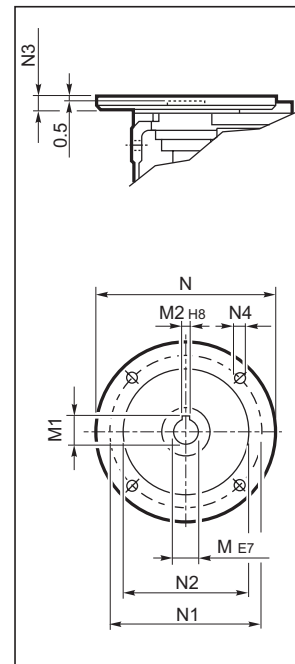


**UFC1  
UFCR1**

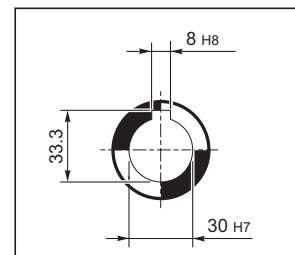
**UFC2  
UFCR2**



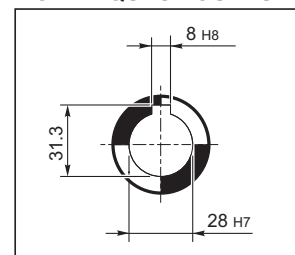
### INPUT



### STANDARD OUTPUT



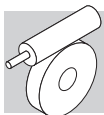
### ON REQUEST OUTPUT



|      |          | M  | M1   | M2 | N   | N1  | N2  | N3  | N4   | P   | Kg  |
|------|----------|----|------|----|-----|-----|-----|-----|------|-----|-----|
| W 75 | P71 B5   | 14 | 16.3 | 5  | 160 | 130 | 110 | 11  | 9    | 112 | 9.5 |
| W 75 | P80 B5   | 19 | 21.8 | 6  | 200 | 165 | 130 | 12  | 11.5 | 112 | 9.7 |
| W 75 | P90 B5   | 24 | 27.3 | 8  | 200 | 165 | 130 | 12  | 11.5 | 112 | 9.6 |
| W 75 | P100 B5  | 28 | 31.3 | 8  | 250 | 215 | 180 | 13  | 12.5 | 120 | 9.7 |
| W 75 | P112 B5  | 28 | 31.3 | 8  | 250 | 215 | 180 | 13  | 12.5 | 120 | 9.7 |
| W 75 | P80 B14  | 19 | 21.8 | 6  | 120 | 100 | 80  | 7.5 | 6.5  | 112 | 9.4 |
| W 75 | P90 B14  | 24 | 27.3 | 8  | 140 | 115 | 95  | 7.5 | 8.5  | 112 | 9.4 |
| W 75 | P100 B14 | 28 | 31.3 | 8  | 160 | 130 | 110 | 10  | 8.5  | 120 | 9.5 |
| W 75 | P112 B14 | 28 | 31.3 | 8  | 160 | 130 | 110 | 10  | 8.5  | 120 | 9.5 |

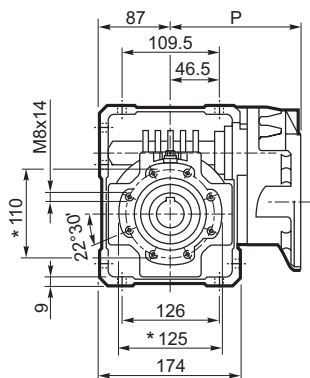
\* Da ambo i lati

# Flangia ridotta

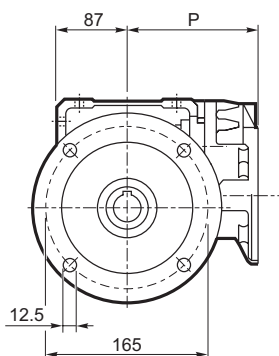


## WR 75...P (IEC)

**U**

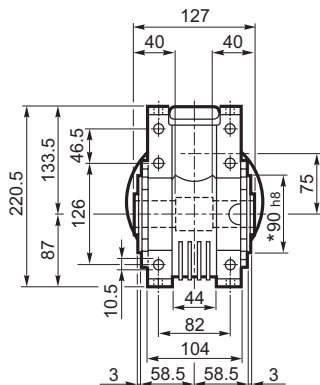
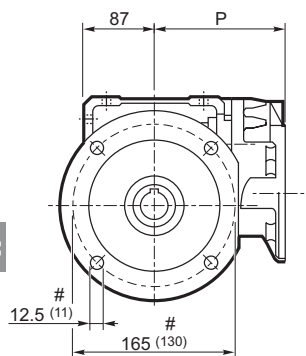


**UF\_**



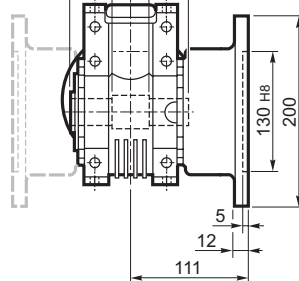
**UFC\_**

**UFCR #**



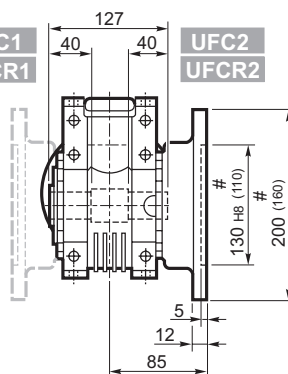
**UF1**

**UF2**

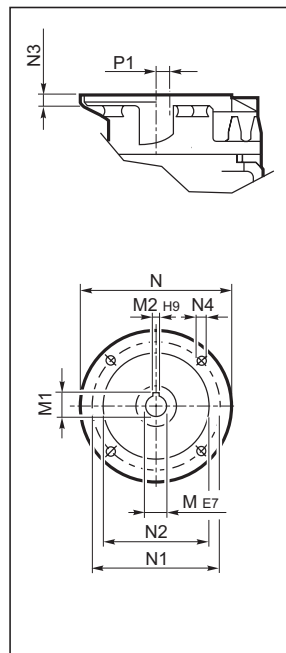


**UFC1**  
**UFCR1**

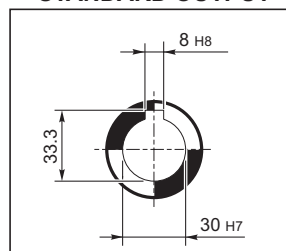
**UFC2**  
**UFCR2**



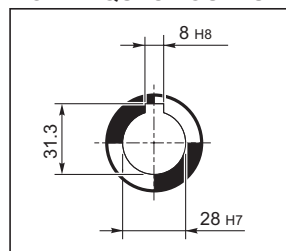
**INPUT**



**STANDARD OUTPUT**



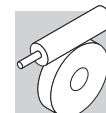
**ON REQUEST OUTPUT**



|              |               | M  | M1   | M2 | N   | N1  | N2  | N3 | N4     | P     | P1    |      |
|--------------|---------------|----|------|----|-----|-----|-----|----|--------|-------|-------|------|
| <b>WR 75</b> | <b>P63 B5</b> | 11 | 12.8 | 4  | 140 | 115 | 95  | 10 | M8x10  | 152   | 23.53 | 10.6 |
| <b>WR 75</b> | <b>P71 B5</b> | 14 | 16.3 | 5  | 160 | 130 | 110 | 10 | M8x10  | 152   | 23.53 | 10.7 |
| <b>WR 75</b> | <b>P80 B5</b> | 19 | 21.8 | 6  | 200 | 165 | 130 | 12 | M10x13 | 163.5 | 11    | 11.5 |
| <b>WR 75</b> | <b>P90 B5</b> | 24 | 27.3 | 8  | 200 | 165 | 130 | 12 | M10x13 | 163.5 | 11    | 11.6 |

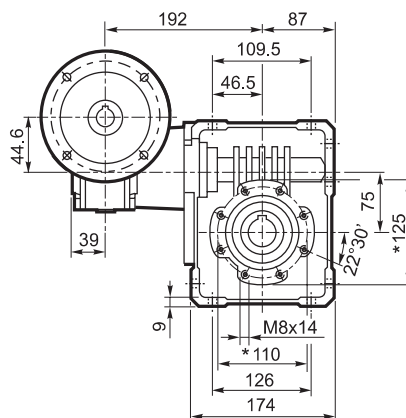
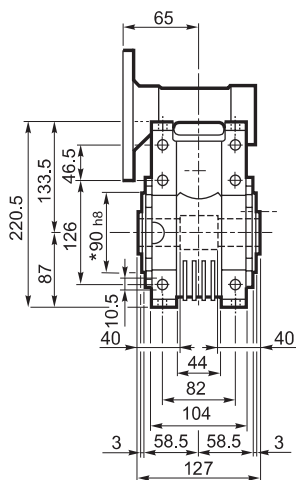
\* Da ambo i lati

# Flangia ridotta

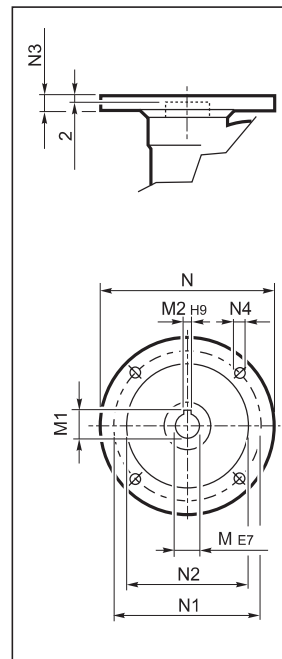


## VF/W 44/75...P (IEC)

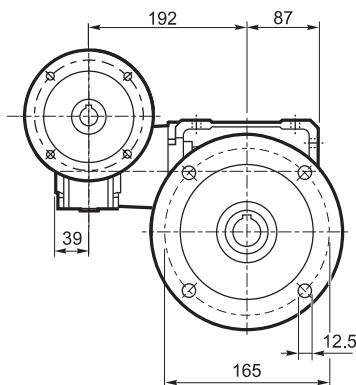
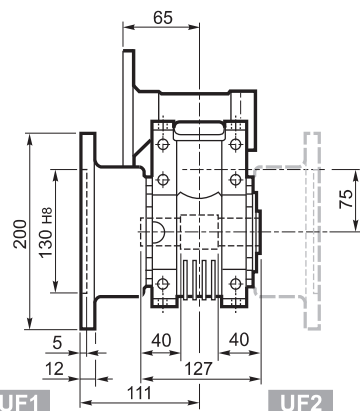
**U**



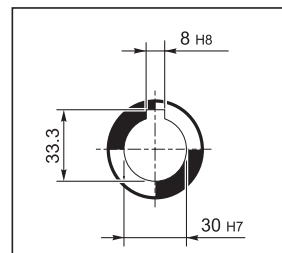
**INPUT**



**UF**

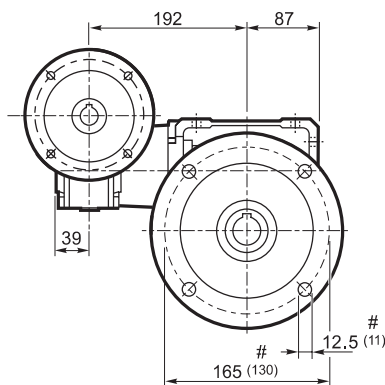
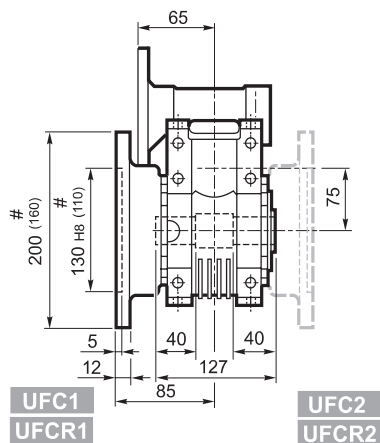


**STANDARD OUTPUT**

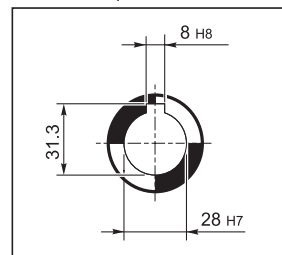


**UFC**

**UFCR #**



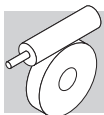
**ON REQUEST OUTPUT**



|            |         | M  | M1   | M2 | N   | N1  | N2  | N3 | N4  |      |
|------------|---------|----|------|----|-----|-----|-----|----|-----|------|
| VF/W 44/75 | P63 B5  | 11 | 12.8 | 4  | 140 | 115 | 95  | 10 | 9.5 | 12.5 |
| VF/W 44/75 | P71 B5  | 14 | 16.3 | 5  | 160 | 130 | 110 | 10 | 9.5 |      |
| VF/W 44/75 | P63 B14 | 11 | 12.8 | 4  | 90  | 75  | 60  | 8  | 5.5 |      |
| VF/W 44/75 | P71 B14 | 14 | 16.3 | 5  | 105 | 85  | 70  | 10 | 7   |      |

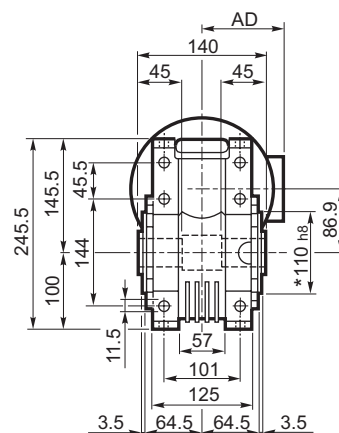
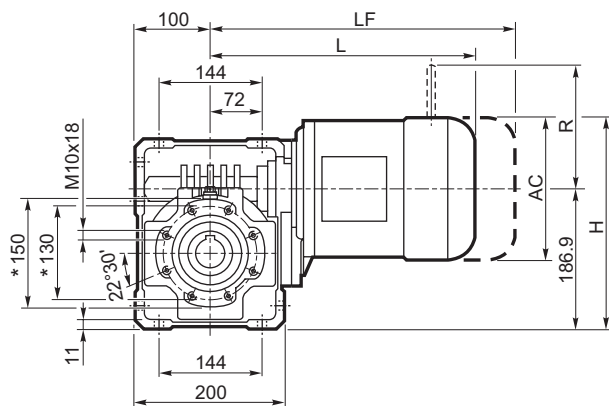
\* Da ambo i lati

# Flangia ridotta

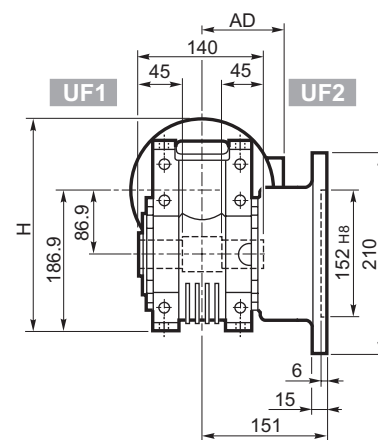
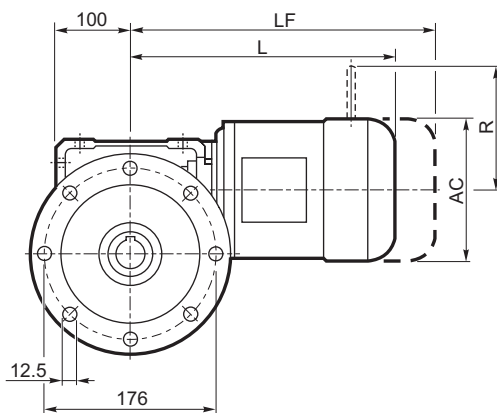


## W 86...M

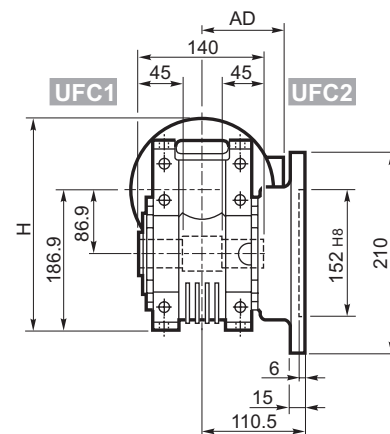
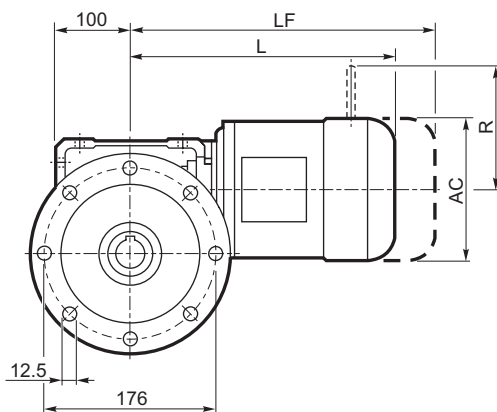
**U**



**UF\_**



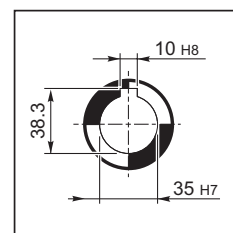
**UFC\_**

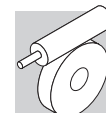


|                                                                                     |                                                                                     |                                                                                     | M_  |       |     |     |                                                                                     | M...FD<br>M...FA |                                                                                     | M...FD |     | M...FA |     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|-------|-----|-----|-------------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------------|--------|-----|--------|-----|
|  |  |  | AC  | H     | L   | AD  |  | LF               |  | R      | AD  | R      | AD  |
| W 86                                                                                | S1                                                                                  | M1                                                                                  | 138 | 256   | 324 | 108 | 20.1                                                                                | 385              | 22.3                                                                                | 103    | 135 | 124    | 108 |
| W 86                                                                                | S2                                                                                  | M2S                                                                                 | 156 | 265   | 349 | 119 | 22.6                                                                                | 425              | 25.7                                                                                | 129    | 146 | 134    | 119 |
| W 86                                                                                | S3                                                                                  | M3S                                                                                 | 193 | 283.5 | 392 | 142 | 29.7                                                                                | 488              | 35                                                                                  | 160    | 158 | 160    | 142 |
| W 86                                                                                | S3                                                                                  | M3L                                                                                 | 193 | 283.5 | 424 | 142 | 33                                                                                  | 515              | 36                                                                                  | 160    | 158 | 160    | 142 |

\* Da ambo i lati

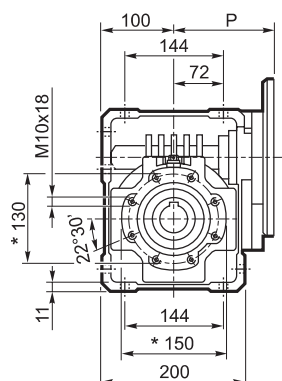
### OUTPUT



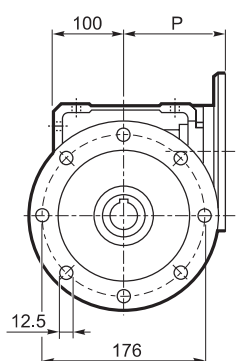


## W 86...P (IEC)

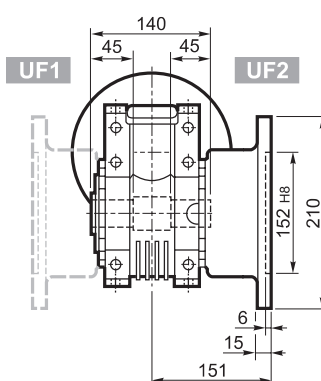
**U**



**UF**

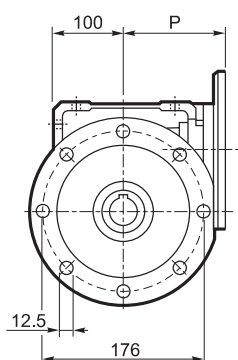


**UF1**

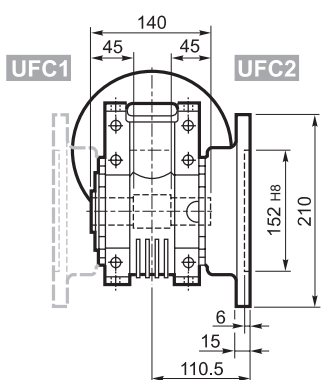


**UF2**

**UFC**

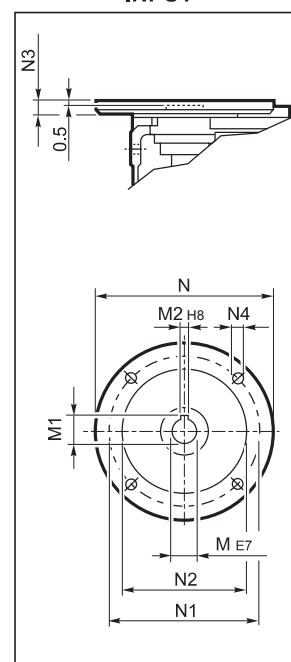


**UFC1**

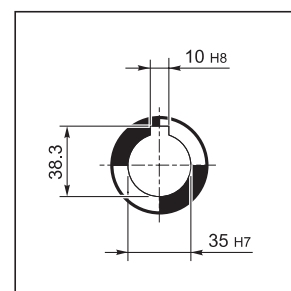


**UFC2**

**INPUT**

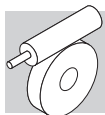


**OUTPUT**



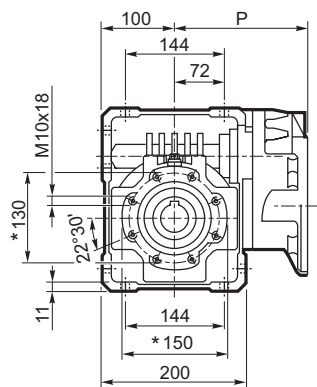
|                                                                                     |                                                                                     | M  | M1   | M2 | N   | N1  | N2  | N3  | N4   | P   | Kg   |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|------|----|-----|-----|-----|-----|------|-----|------|
|  |  |    |      |    |     |     |     |     |      |     |      |
| W 86                                                                                | P71 B5                                                                              | 14 | 16.3 | 5  | 160 | 130 | 110 | 11  | 9    | 128 | 13.6 |
| W 86                                                                                | P80 B5                                                                              | 19 | 21.8 | 6  | 200 | 165 | 130 | 12  | 11.5 | 128 | 13.8 |
| W 86                                                                                | P90 B5                                                                              | 24 | 27.3 | 8  | 200 | 165 | 130 | 12  | 11.5 | 128 | 13.7 |
| W 86                                                                                | P100 B5                                                                             | 28 | 31.3 | 8  | 250 | 215 | 180 | 13  | 12.5 | 136 | 13.8 |
| W 86                                                                                | P112 B5                                                                             | 28 | 31.3 | 8  | 250 | 215 | 180 | 13  | 12.5 | 136 | 13.8 |
| W 86                                                                                | P80 B14                                                                             | 19 | 21.8 | 6  | 120 | 100 | 80  | 7.5 | 6.5  | 128 | 13.5 |
| W 86                                                                                | P90 B14                                                                             | 24 | 27.3 | 8  | 140 | 115 | 95  | 7.5 | 8.5  | 128 | 13.5 |
| W 86                                                                                | P100 B14                                                                            | 28 | 31.3 | 8  | 160 | 130 | 110 | 10  | 8.5  | 136 | 13.6 |
| W 86                                                                                | P112 B14                                                                            | 28 | 31.3 | 8  | 160 | 130 | 110 | 10  | 8.5  | 136 | 13.6 |

\* Da ambo i lati

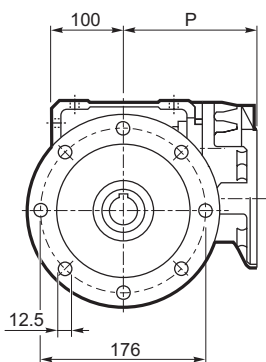


## WR 86...P (IEC)

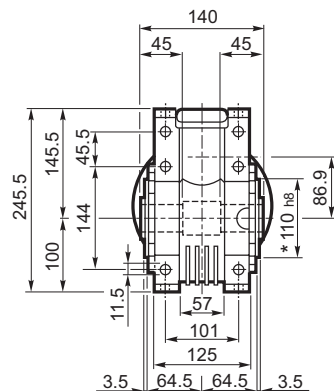
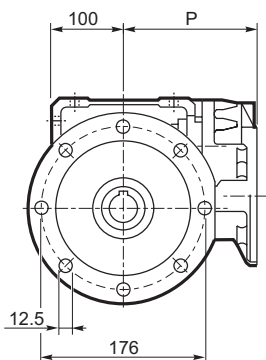
**U**



**UF**

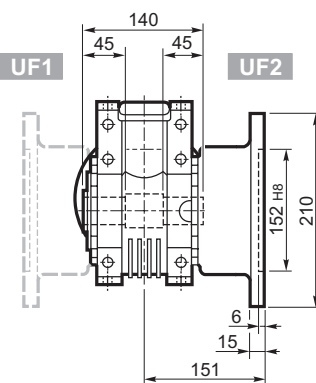


**UFC**



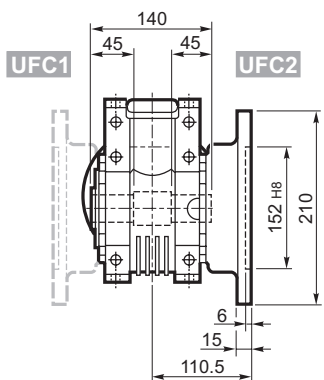
**UF1**

**UF2**

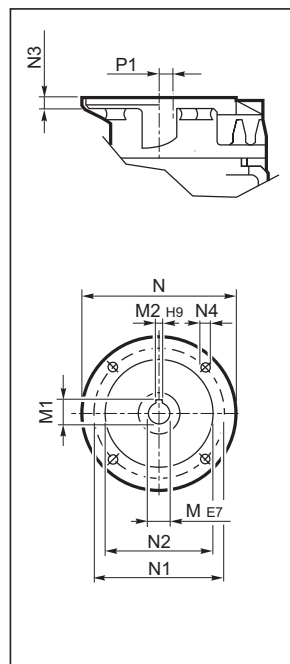


**UFC1**

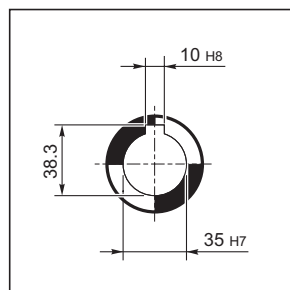
**UFC2**



**INPUT**

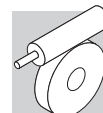


**OUTPUT**



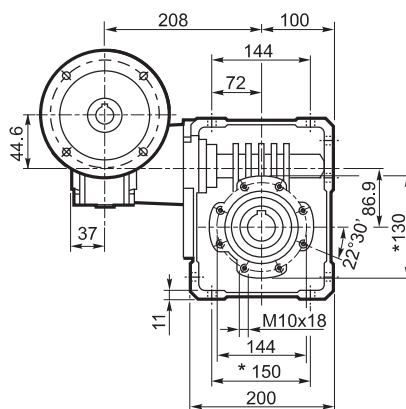
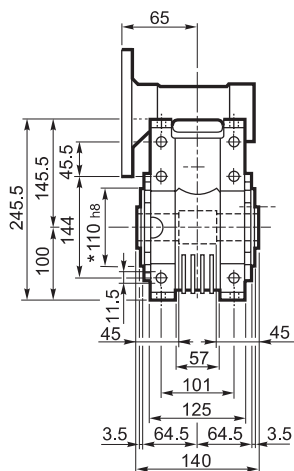
|              |               | M  | M1   | M2 | N   | N1  | N2  | N3 | N4     | P     | P1   | Kg   |
|--------------|---------------|----|------|----|-----|-----|-----|----|--------|-------|------|------|
| <b>WR 86</b> | <b>P63 B5</b> | 11 | 12.8 | 4  | 140 | 115 | 95  | 10 | M8x10  | 168   | 35.4 | 14.3 |
| <b>WR 86</b> | <b>P71 B5</b> | 14 | 16.3 | 5  | 160 | 130 | 110 | 10 | M8x10  | 168   | 35.4 | 14.4 |
| <b>WR 86</b> | <b>P80 B5</b> | 19 | 21.8 | 6  | 200 | 165 | 130 | 12 | M10x13 | 179.5 | 22.9 | 15.2 |
| <b>WR 86</b> | <b>P90 B5</b> | 24 | 27.3 | 8  | 200 | 165 | 130 | 12 | M10x13 | 179.5 | 22.9 | 15.3 |

\* Da ambo i lati

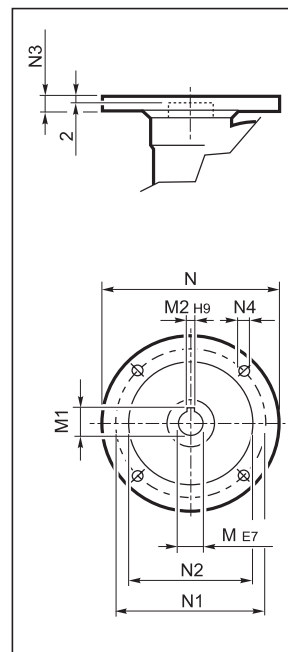


## VF/W 44/86... P (IEC)

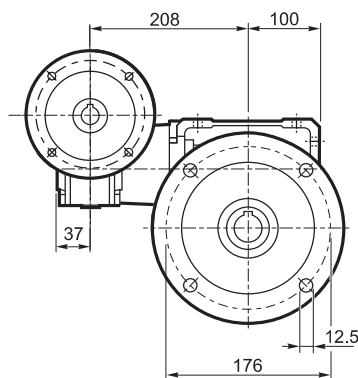
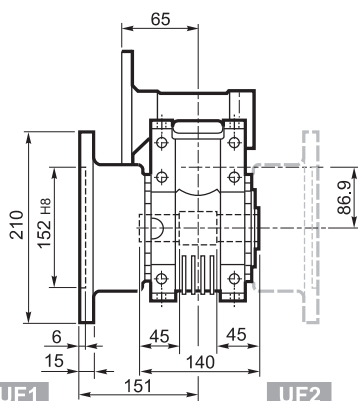
**U**



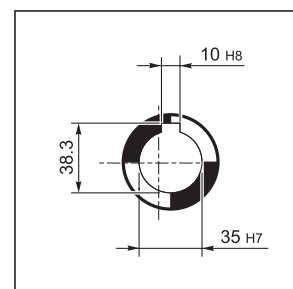
**INPUT**



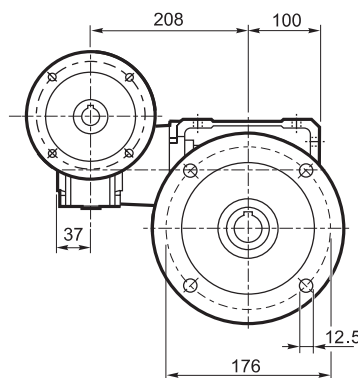
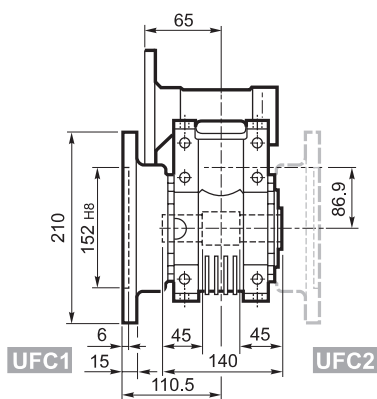
**UF**



**OUTPUT**

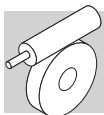


**UFC**



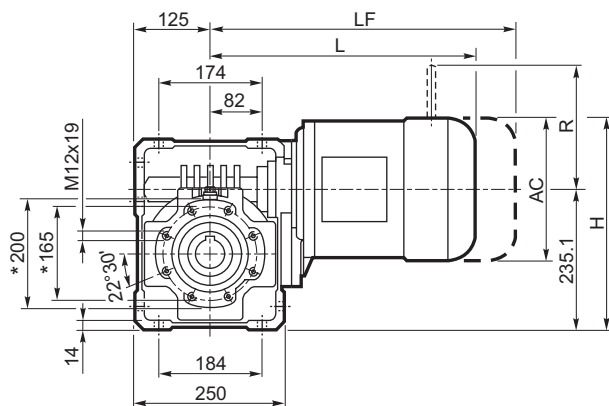
|            |         | M  | M1   | M2 | N   | N1  | N2  | N3 | N4  | Kg   |
|------------|---------|----|------|----|-----|-----|-----|----|-----|------|
|            |         |    |      |    |     |     |     |    |     |      |
| VF/W 44/86 | P63 B5  | 11 | 12.8 | 4  | 140 | 115 | 95  | 10 | 9.5 | 16.6 |
| VF/W 44/86 | P71 B5  | 14 | 16.3 | 5  | 160 | 130 | 110 | 10 | 9.5 |      |
| VF/W 44/86 | P63 B14 | 11 | 12.8 | 4  | 90  | 75  | 60  | 8  | 5.5 |      |
| VF/W 44/86 | P71 B14 | 14 | 16.3 | 5  | 105 | 85  | 70  | 10 | 7   |      |

\* Da ambo i lati

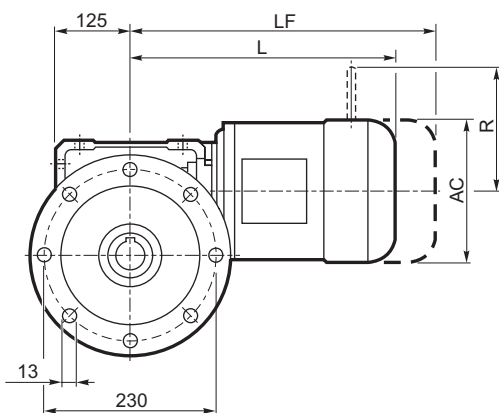


## W 110...M

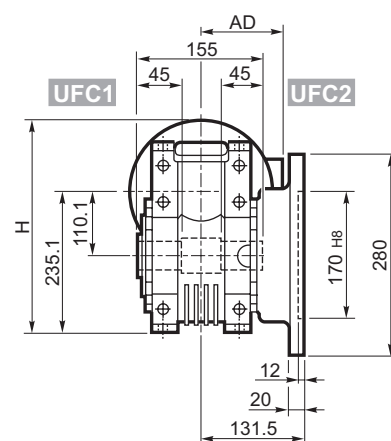
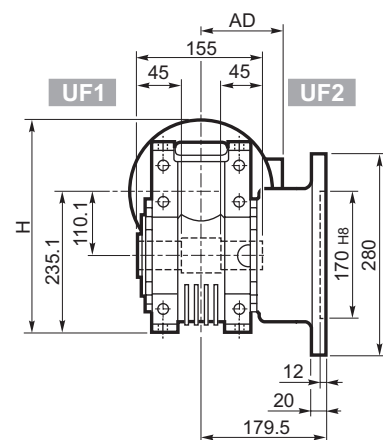
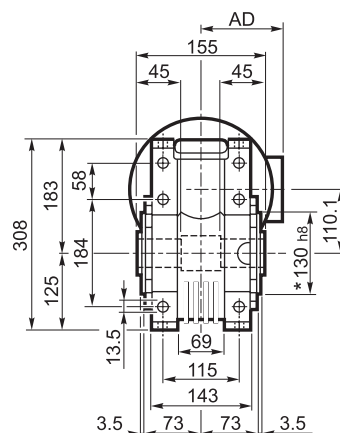
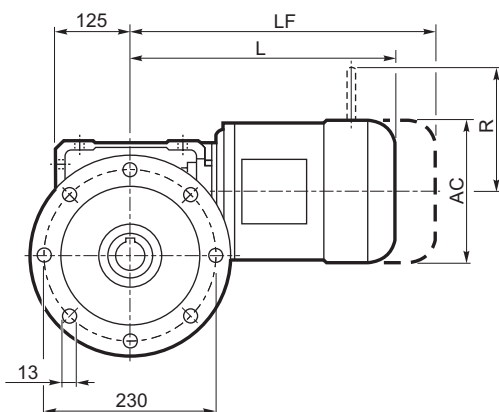
**U**



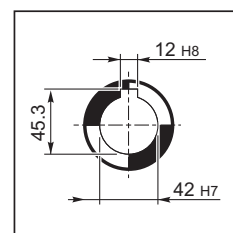
**UF<sub>-</sub>**



**UFC<sub>-</sub>**

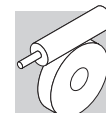


### OUTPUT



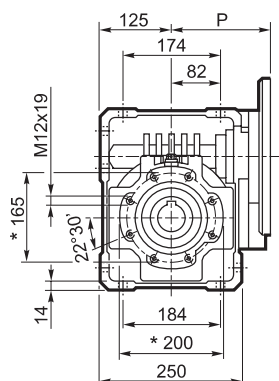
|                                                                                     |                                                                                     |                                                                                     | M_  |     |     |     |                                                                                     | M...FD<br>M...FA |                                                                                     | M...FD |     | M...FA |     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|-----|-----|-----|-------------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------------|--------|-----|--------|-----|
|  |  |  | AC  | H   | L   | AD  |  | LF               |  | R      | AD  | R      | AD  |
| W 110                                                                               | S2                                                                                  | M2S                                                                                 | 156 | 313 | 364 | 119 | 38                                                                                  | 440              | 41                                                                                  | 129    | 146 | 134    | 119 |
| W 110                                                                               | S3                                                                                  | M3S                                                                                 | 193 | 332 | 407 | 142 | 46                                                                                  | 503              | 50                                                                                  | 160    | 158 | 160    | 142 |
| W 110                                                                               | S3                                                                                  | M3L                                                                                 | 193 | 332 | 439 | 142 | 48                                                                                  | 530              | 53                                                                                  | 160    | 158 | 160    | 142 |

\* Da ambo i lati

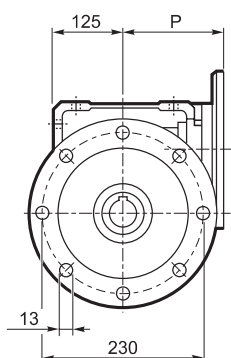


## W 110...P (IEC)

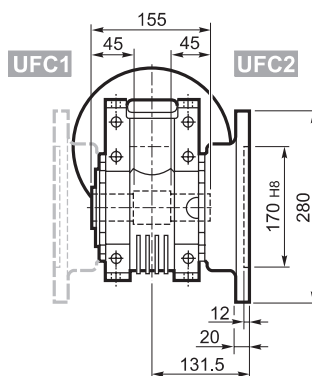
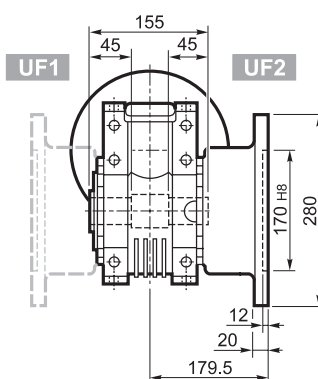
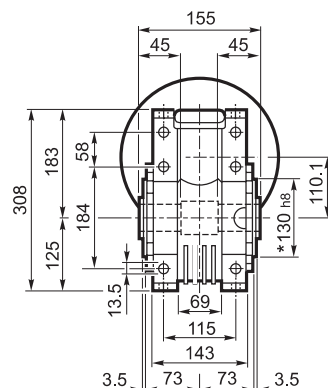
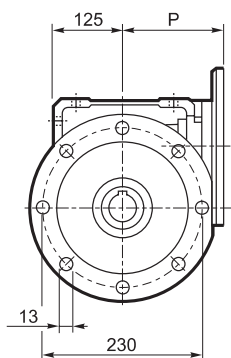
**U**



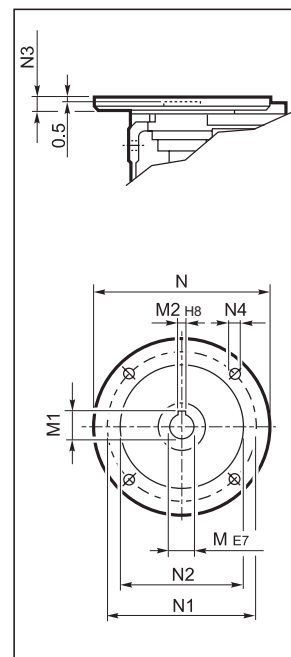
**UF\_**



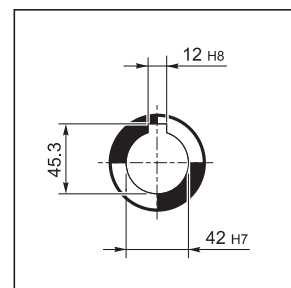
**UFC\_**



**INPUT**

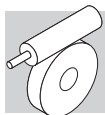


**OUTPUT**



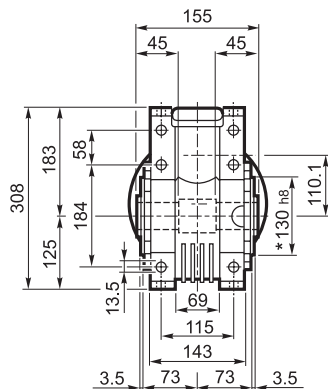
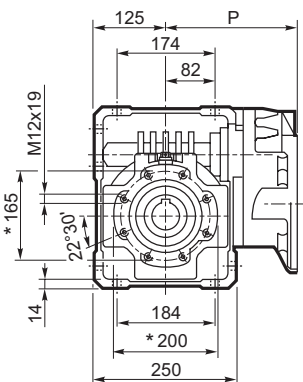
|       |          | M  | M1   | M2 | N   | N1  | N2  | N3  | N4     | P   | Kg   |
|-------|----------|----|------|----|-----|-----|-----|-----|--------|-----|------|
|       |          |    |      |    |     |     |     |     |        |     |      |
| W 110 | P80 B5   | 19 | 21.8 | 6  | 200 | 165 | 130 | —   | M10x12 | 143 | 28   |
| W 110 | P90 B5   | 24 | 27.3 | 8  | 200 | 165 | 130 | —   | M10x12 | 143 | 28   |
| W 110 | P100 B5  | 28 | 31.3 | 8  | 250 | 215 | 180 | 13  | 13     | 151 | 29   |
| W 110 | P112 B5  | 28 | 31.3 | 8  | 250 | 215 | 180 | 13  | 13     | 151 | 29   |
| W 110 | P132 B5  | 38 | 41.3 | 10 | 300 | 265 | 230 | 16  | 14     | 226 | 31   |
| W 110 | P80 B14  | 19 | 21.8 | 6  | 120 | 100 | 80  | 7.5 | 7      | 143 | 27.5 |
| W 110 | P90 B14  | 24 | 27.3 | 8  | 140 | 115 | 95  | 6.5 | 9      | 143 | 27.5 |
| W 110 | P100 B14 | 28 | 31.3 | 8  | 160 | 130 | 110 | 13  | 9      | 151 | 27   |
| W 110 | P112 B14 | 28 | 31.3 | 8  | 160 | 130 | 110 | 13  | 9      | 151 | 27   |

\* Da ambo i lati

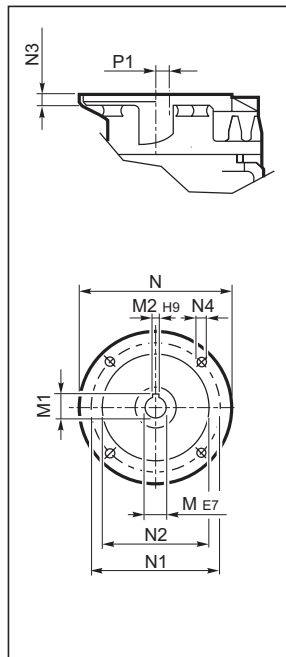


## WR 110...P (IEC)

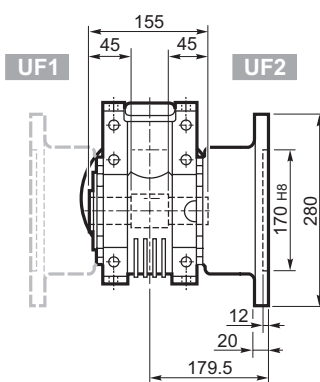
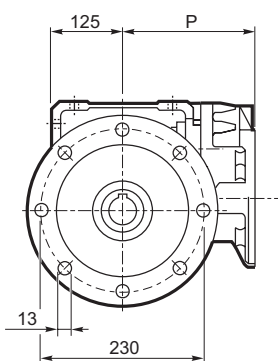
**U**



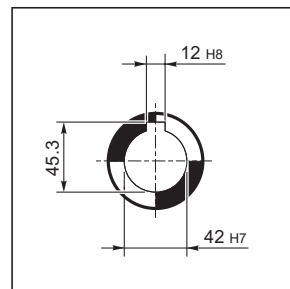
**INPUT**



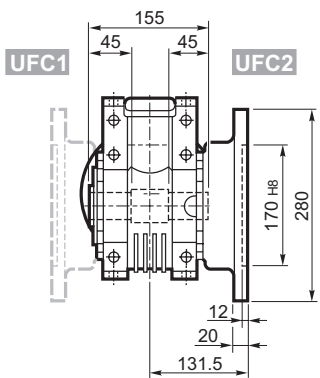
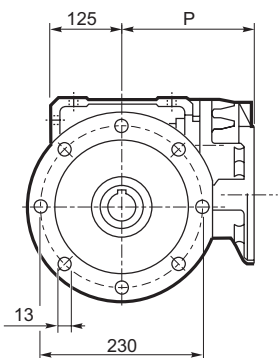
**UF**



**OUTPUT**

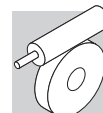


**UFC**



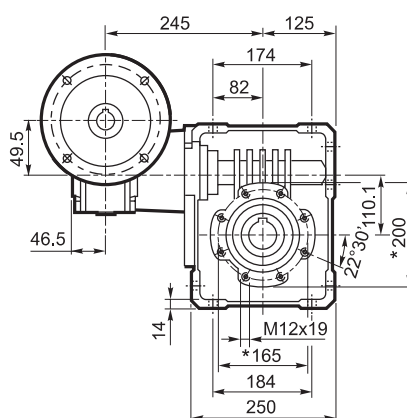
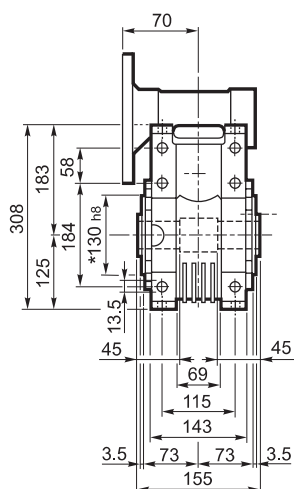
|        |         | M  | M1   | M2 | N   | N1  | N2  | N3 | N4     | P   | P1   | Kg   |
|--------|---------|----|------|----|-----|-----|-----|----|--------|-----|------|------|
| WR 110 | P71 B5  | 14 | 16.3 | 5  | 160 | 130 | 110 | 10 | M8x14  | 185 | 58.6 | 30.5 |
| WR 110 | P80 B5  | 19 | 21.8 | 6  | 200 | 165 | 130 | 14 | M10x15 | 204 | 21.1 | 31   |
| WR 110 | P90 B5  | 24 | 27.3 | 8  | 200 | 165 | 130 | 14 | M10x15 | 204 | 21.1 | 31   |
| WR 110 | P100 B5 | 28 | 31.3 | 8  | 250 | 215 | 180 | 14 | M12x13 | 213 | 21.1 | 32   |
| WR 110 | P112 B5 | 28 | 31.3 | 8  | 250 | 215 | 180 | 14 | M12x13 | 213 | 21.1 | 32   |

\* Da ambo i lati

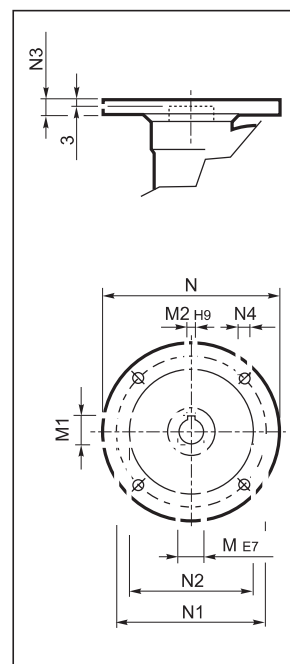


## VF/W 49/110...P (IEC)

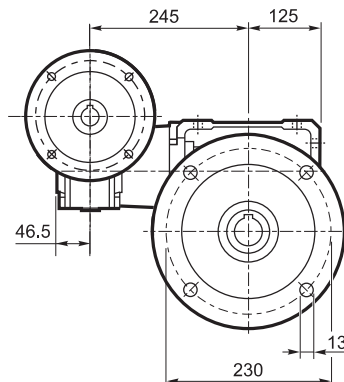
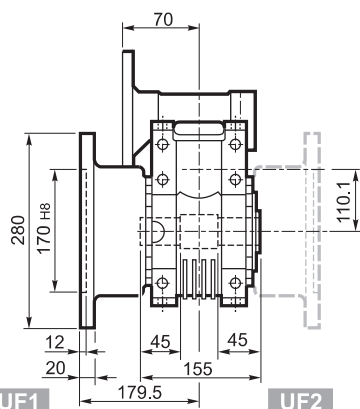
**U**



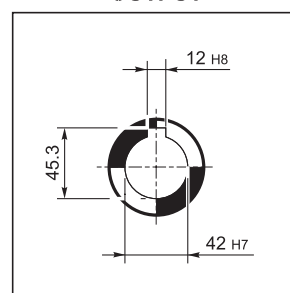
**INPUT**



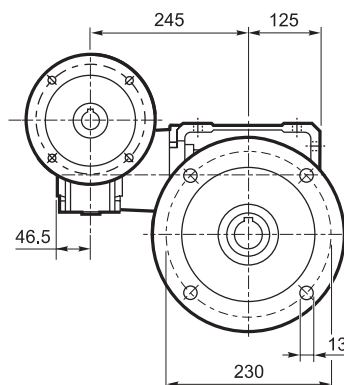
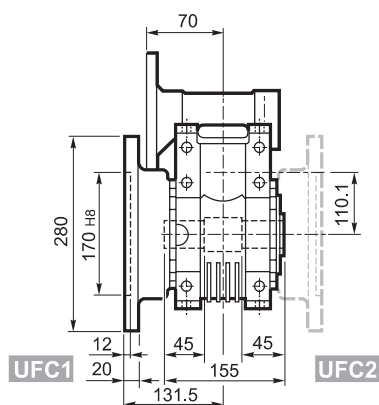
**UF**



**OUTPUT**

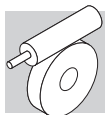


**UFC**



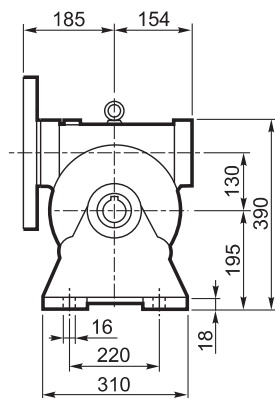
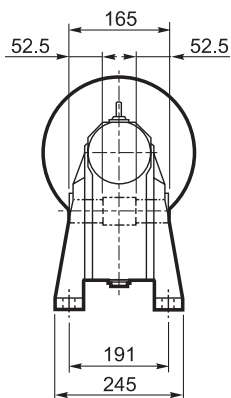
|             |         | M  | M1   | M2 | N   | N1  | N2  | N3   | N4   | Kg |
|-------------|---------|----|------|----|-----|-----|-----|------|------|----|
|             |         |    |      |    |     |     |     |      |      |    |
| VF/W 49/110 | P63 B5  | 11 | 12.8 | 4  | 140 | 115 | 95  | 10.5 | 9.5  | 33 |
| VF/W 49/110 | P71 B5  | 14 | 16.3 | 5  | 160 | 130 | 110 | 10.5 | 9.5  |    |
| VF/W 49/110 | P80 B5  | 19 | 21.8 | 6  | 200 | 165 | 130 | 10   | 11.5 |    |
| VF/W 49/110 | P63 B14 | 11 | 12.8 | 4  | 90  | 75  | 60  | 7    | 6    |    |
| VF/W 49/110 | P71 B14 | 14 | 16.3 | 5  | 105 | 85  | 70  | 10.5 | 6.5  |    |
| VF/W 49/110 | P80 B14 | 19 | 21.8 | 6  | 120 | 100 | 80  | 10   | 7    |    |

\* Da ambo i lati

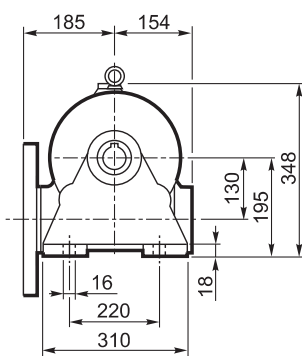
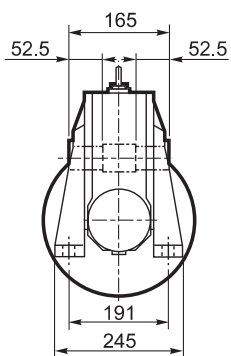


## VF 130...P (IEC)

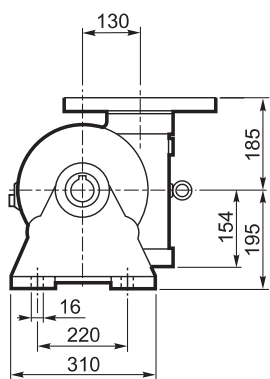
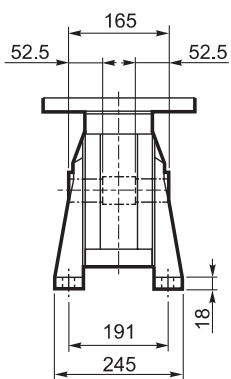
**A**



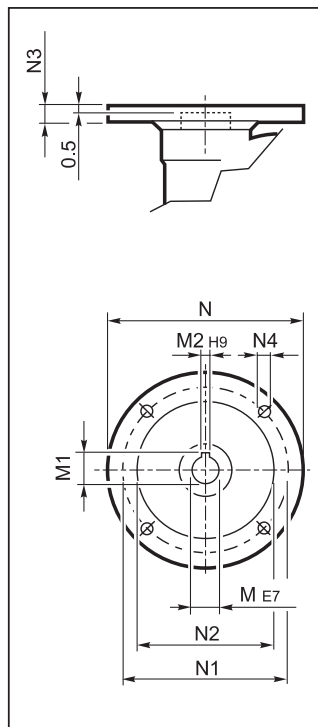
**N**



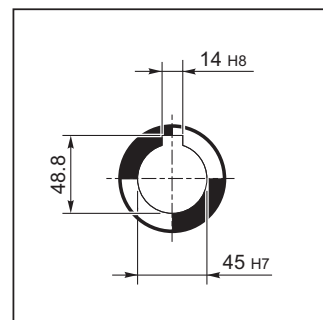
**V**

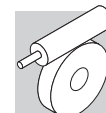


**INPUT**

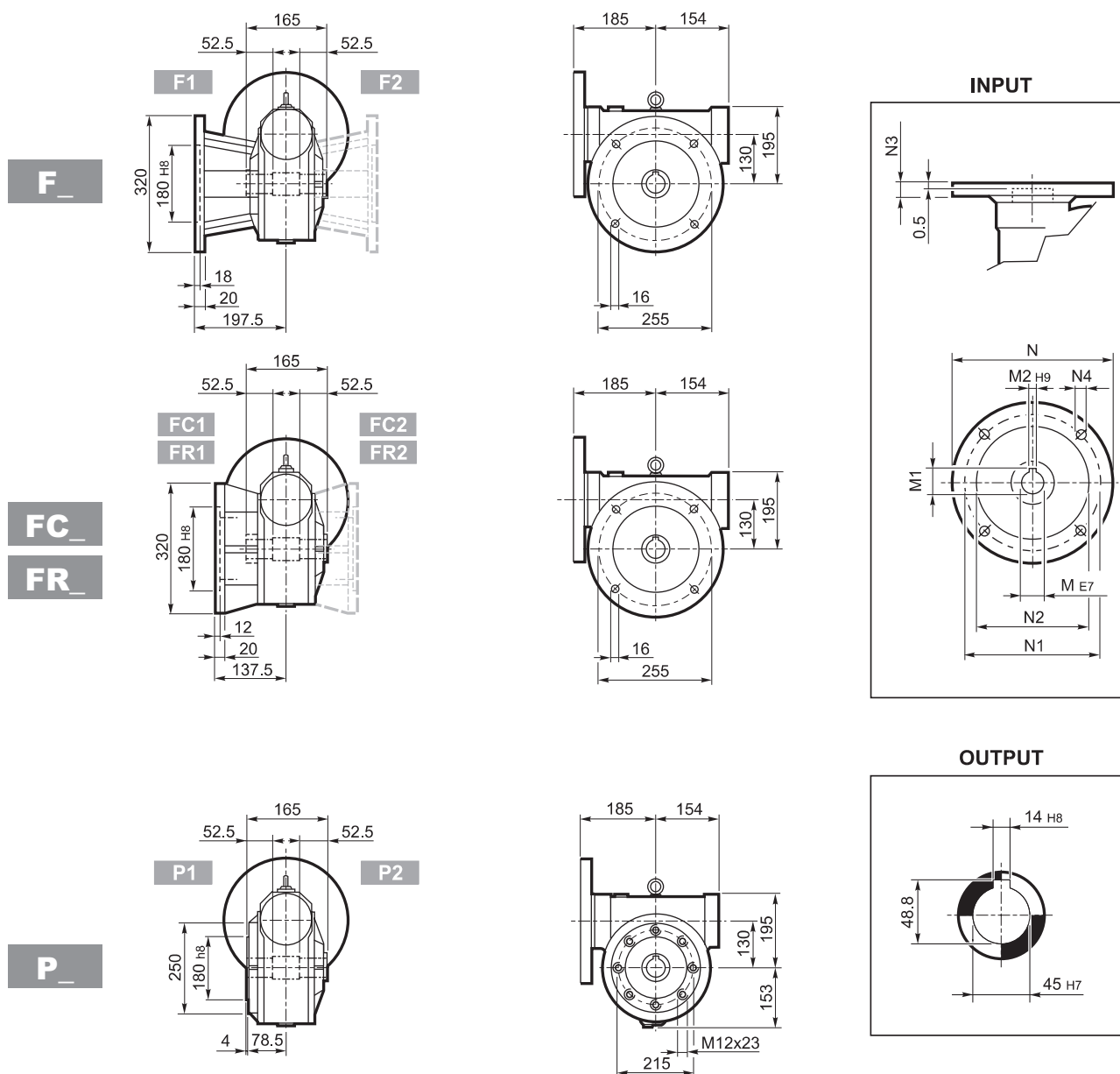


**OUTPUT**



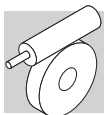


## VF 130...P (IEC)



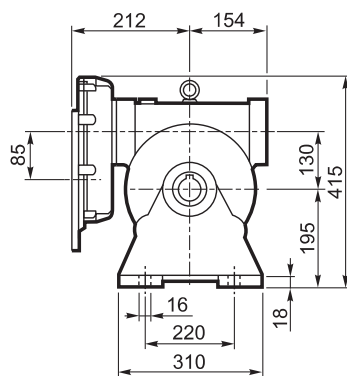
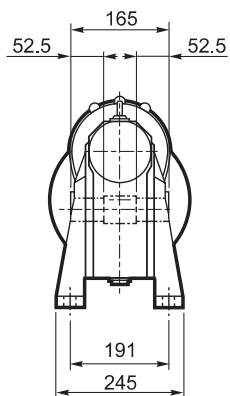
|                                                                                     |                                                                                     | M  | M1    | M2 | N   | N1  | N2  | N3 | N4 | Kg |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|-------|----|-----|-----|-----|----|----|----|
|  |  |    |       |    |     |     |     |    |    |    |
| VF130                                                                               | P90 B5                                                                              | 24 | 27.3  | 8  | 200 | 165 | 130 | 17 | 11 | 49 |
| VF130                                                                               | P100 B5                                                                             | 28 | 31.3  | 8  | 250 | 215 | 180 | 17 | 13 |    |
| VF130                                                                               | P112 B5                                                                             | 28 | 31.3  | 8  | 250 | 215 | 180 | 17 | 13 |    |
| VF130                                                                               | P132 B5                                                                             | 38 | 40.1# | 10 | 300 | 265 | 230 | 17 | 13 |    |

# Linguetta ribassata

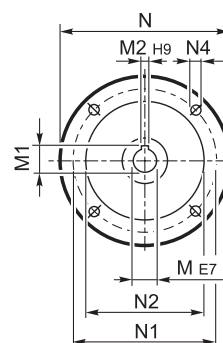
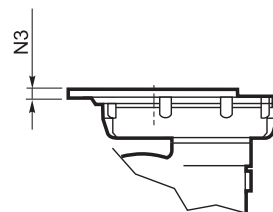


## VFR 130...P (IEC)

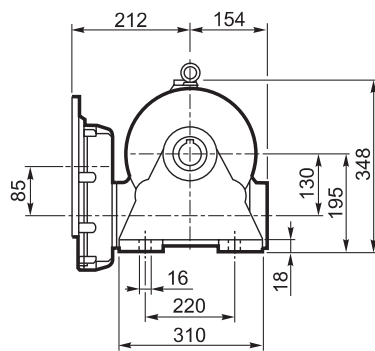
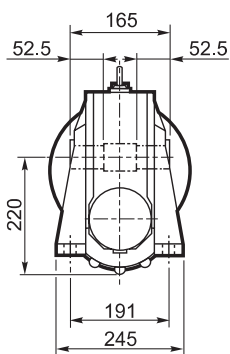
**A**



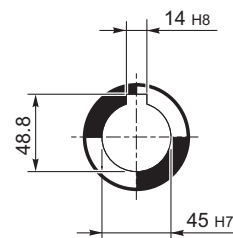
**INPUT**



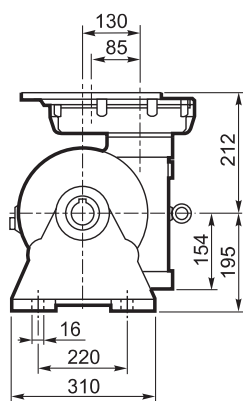
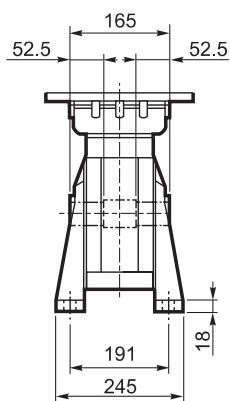
**N**

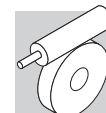


**OUTPUT**

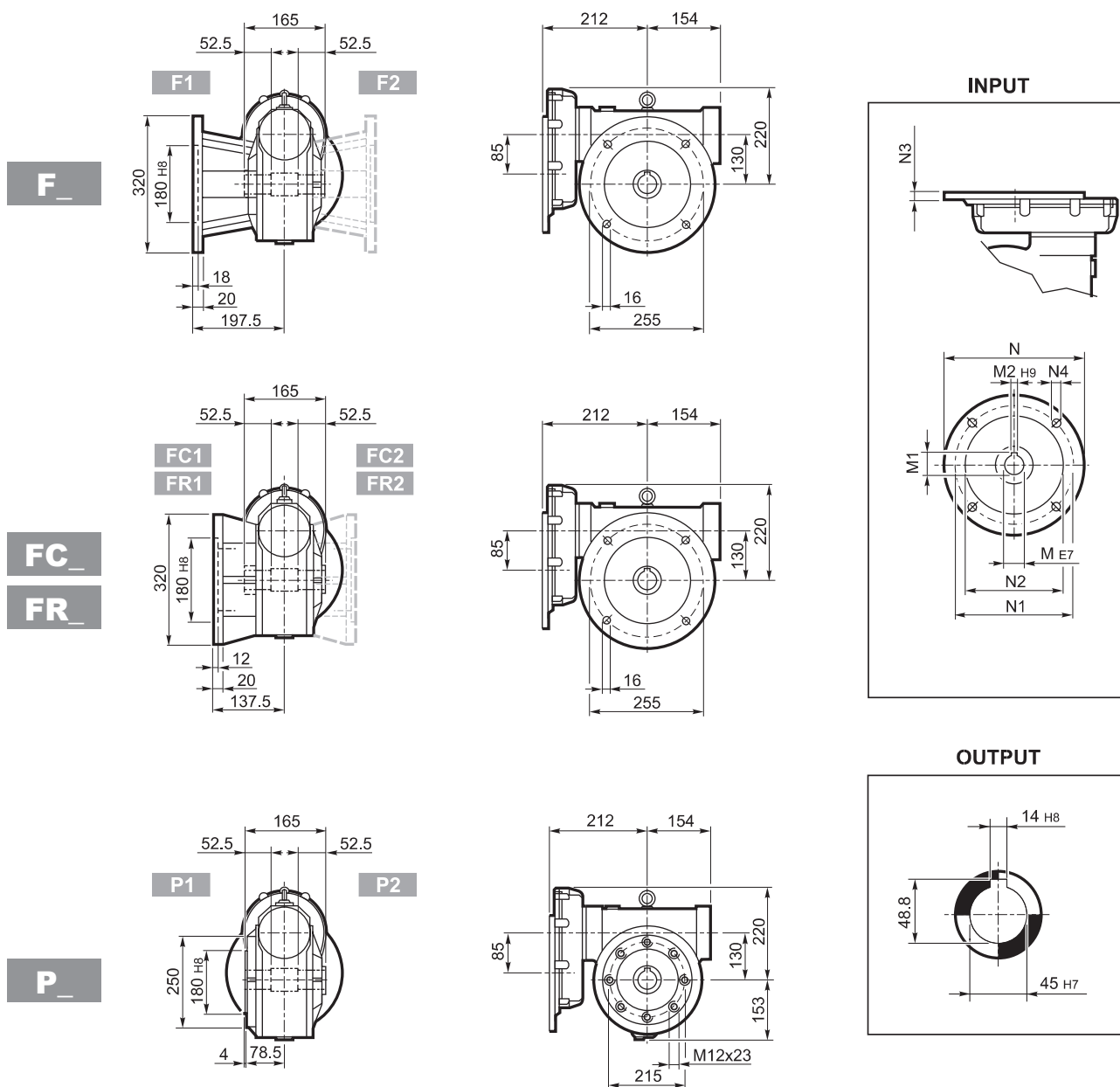


**V**



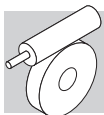


## VFR 130...P (IEC)



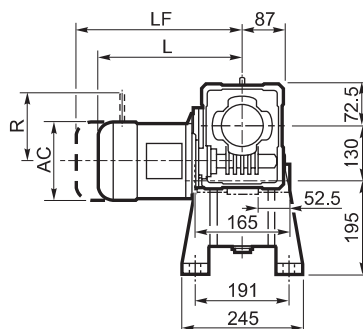
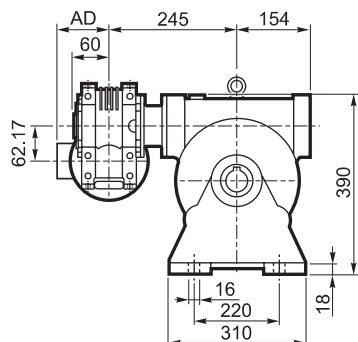
|         |         | M     | M1    | M2 | N   | N1  | N2  | N3 | N4     | Kg |
|---------|---------|-------|-------|----|-----|-----|-----|----|--------|----|
| VFR 130 | P80 B5  | 19 K6 | 21.8  | 6  | 200 | 165 | 130 | 12 | M10x25 | 57 |
| VFR 130 | P90 B5  | 24 K6 | 27.3  | 8  | 200 | 165 | 130 | 12 | M10x25 |    |
| VFR 130 | P100 B5 | 28 J6 | 29.1# | 8  | 250 | 215 | 180 | 13 | M12x35 |    |
| VFR 130 | P112 B5 | 28 J6 | 29.1# | 8  | 250 | 215 | 180 | 13 | M12x35 |    |

# Linguetta ribassata

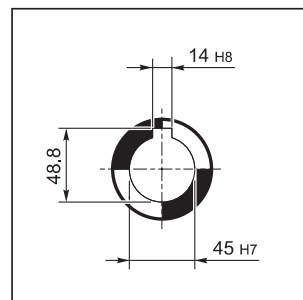


## W/VF 63/130...M

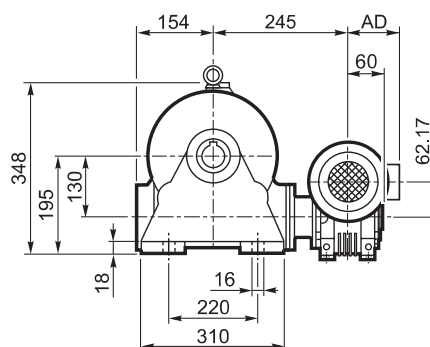
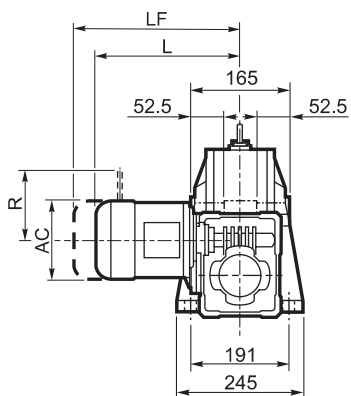
**A**



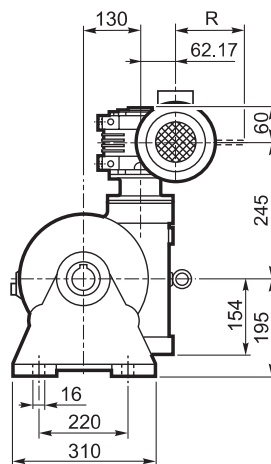
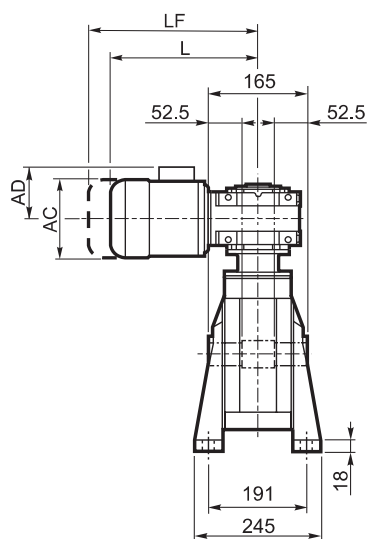
**OUTPUT**

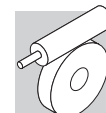


**N**



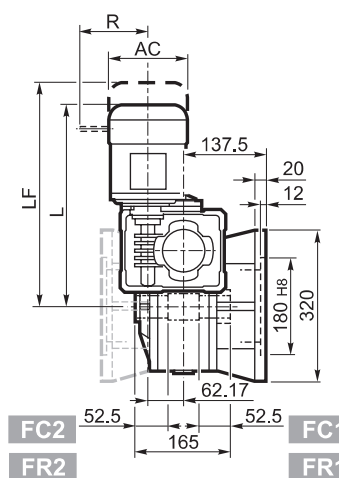
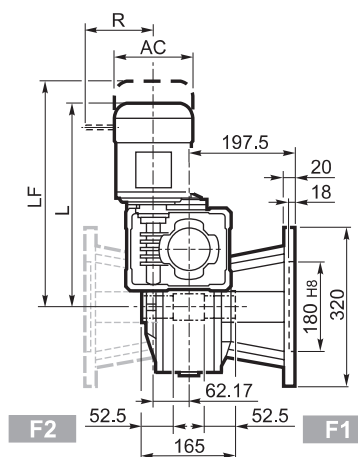
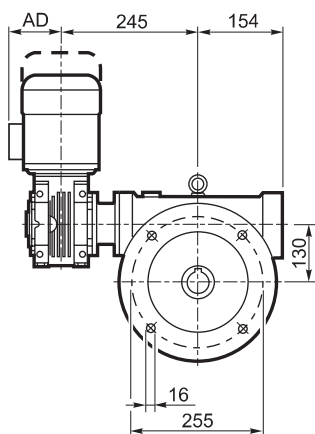
**V**



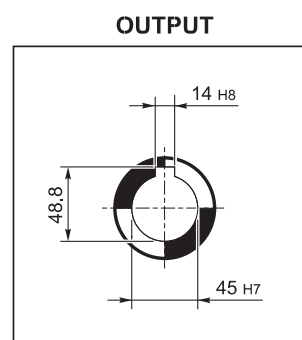
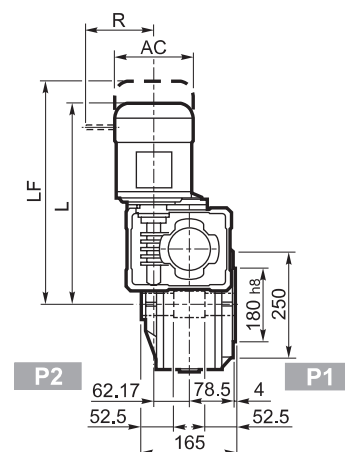
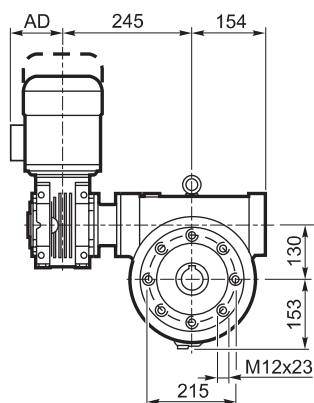


## W/VF 63/130...M

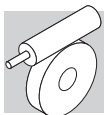
**F\_**  
**FC\_**  
**FR\_**



**P\_**

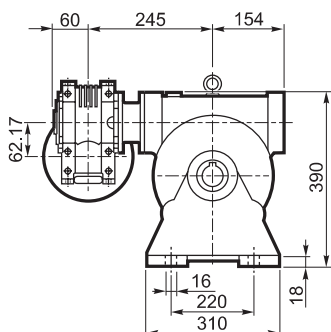


|             |    |     | M_  |     |     |    | M...FD<br>M...FA |    | M...FD |     | M...FA |     |
|-------------|----|-----|-----|-----|-----|----|------------------|----|--------|-----|--------|-----|
|             |    |     | AC  | L   | AD  | Kg | LF               | Kg | R      | AD  | R      | AD  |
| W/VF 63/130 | S1 | M1  | 138 | 419 | 108 | 63 | 480              | 65 | 103    | 135 | 124    | 108 |
| W/VF 63/130 | S2 | M2S | 156 | 447 | 119 | 68 | 523              | 71 | 129    | 146 | 134    | 119 |

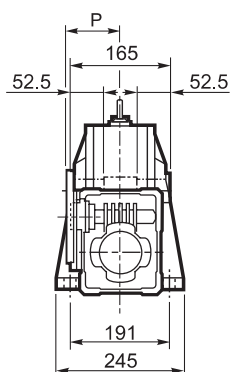


## W/VF 63/130...P (IEC)

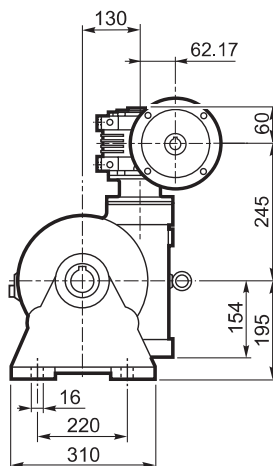
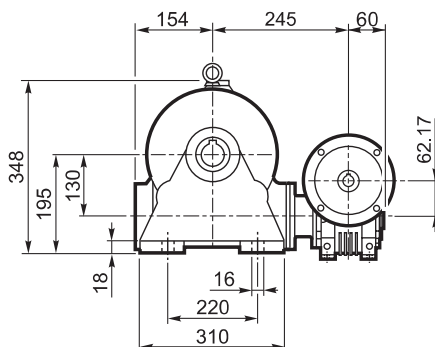
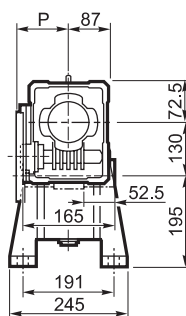
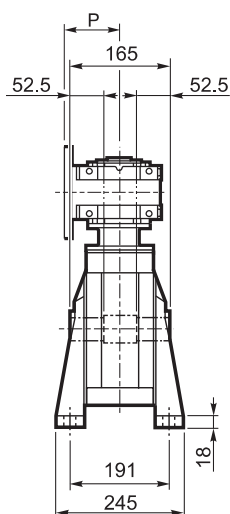
**A**



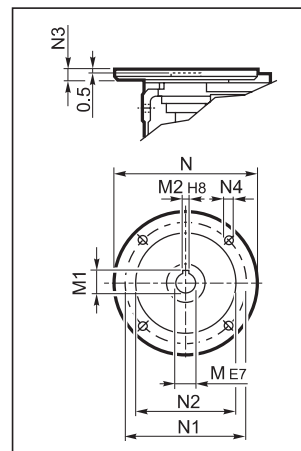
**N**



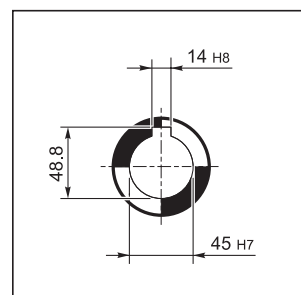
**V**

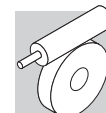


**INPUT**



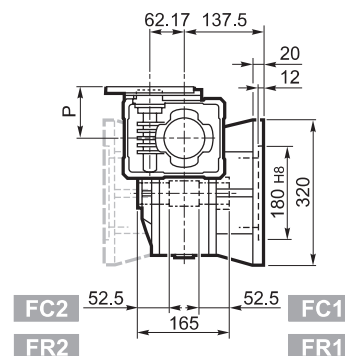
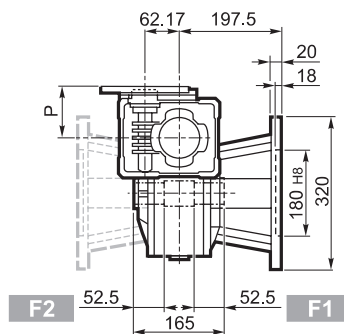
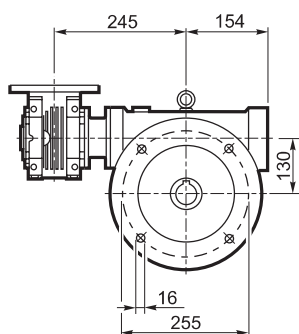
**OUTPUT**



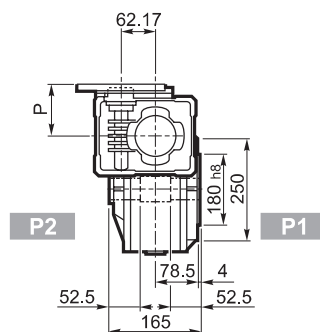
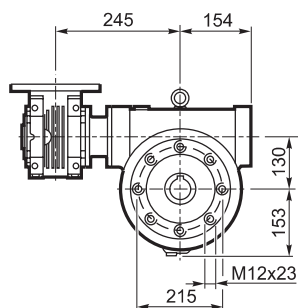


## W/VF 63/130...P (IEC)

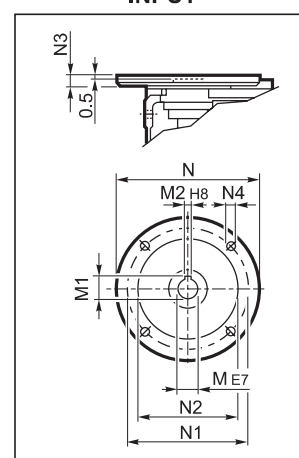
**F\_**  
**FC\_**  
**FR\_**



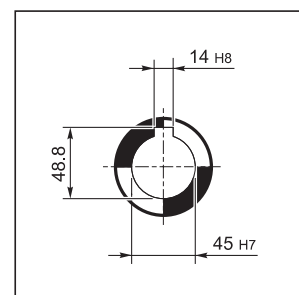
**P\_**



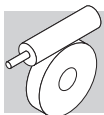
### INPUT



### OUTPUT

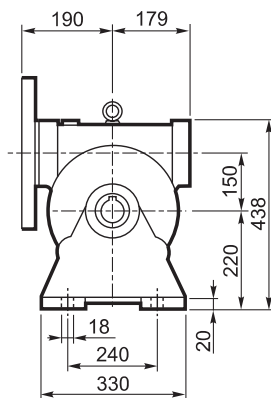
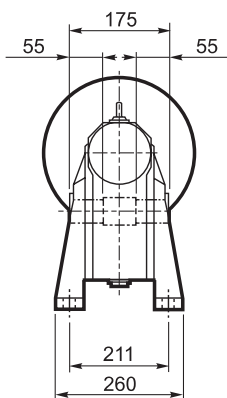


|             |         | M  | M1   | M2 | N   | N1  | N2  | N3 | N4   | P   | Kg |
|-------------|---------|----|------|----|-----|-----|-----|----|------|-----|----|
| W/VF 63/130 | P71 B5  | 14 | 16.3 | 5  | 160 | 130 | 110 | 11 | 9    | 95  | 57 |
| W/VF 63/130 | P80 B5  | 19 | 21.8 | 6  | 200 | 165 | 130 | 12 | 11.5 | 102 |    |
| W/VF 63/130 | P90 B5  | 24 | 27.3 | 8  | 200 | 165 | 130 | 12 | 11.5 | 102 |    |
| W/VF 63/130 | P71 B14 | 14 | 16.3 | 5  | 105 | 85  | 70  | 11 | 6.5  | 95  |    |
| W/VF 63/130 | P80 B14 | 19 | 21.8 | 6  | 120 | 100 | 80  | 11 | 6.5  | 102 |    |
| W/VF 63/130 | P90 B14 | 24 | 27.3 | 8  | 140 | 115 | 95  | 11 | 8.5  | 102 |    |

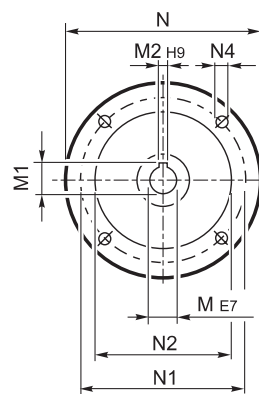
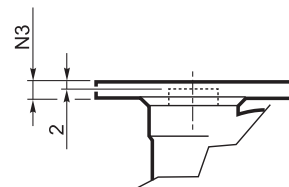


## VF 150...P (IEC)

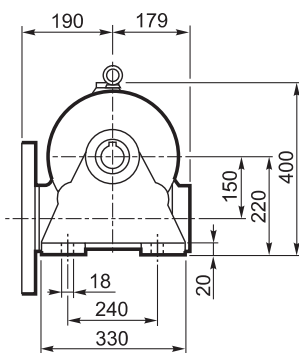
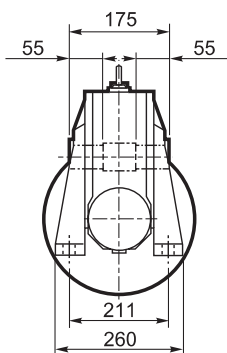
**A**



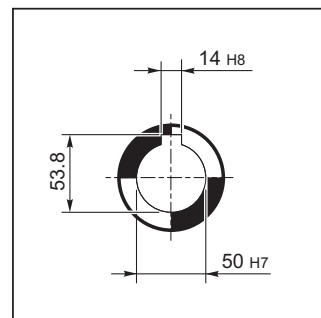
**INPUT**



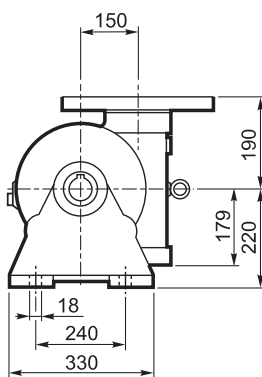
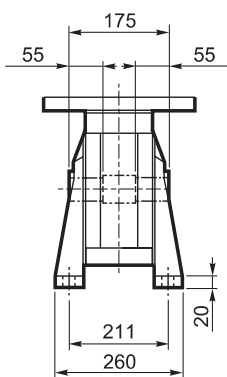
**N**

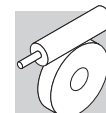


**OUTPUT**



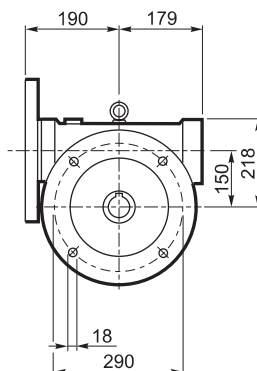
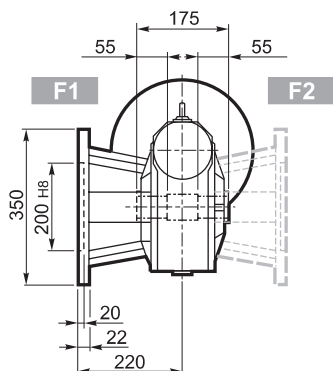
**V**



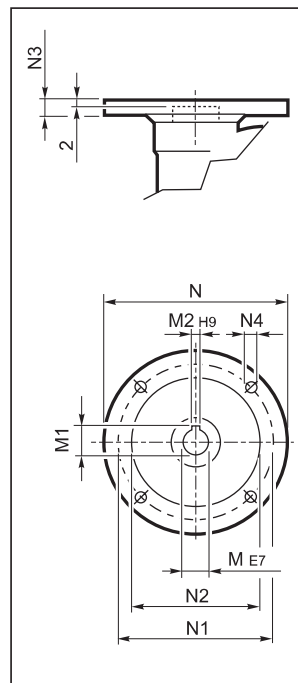


## VF 150...P (IEC)

**F\_**

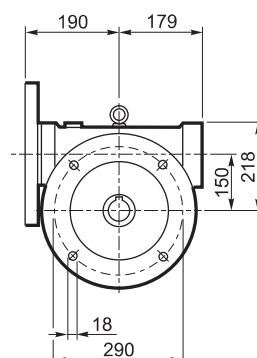
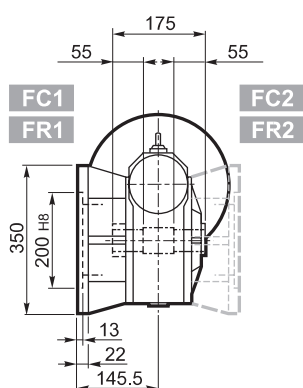


**INPUT**

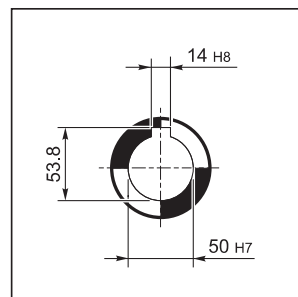


**FC\_**

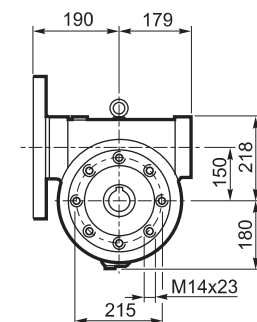
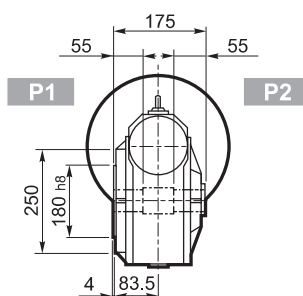
**FR\_**



**OUTPUT**

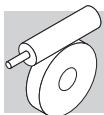


**P\_**



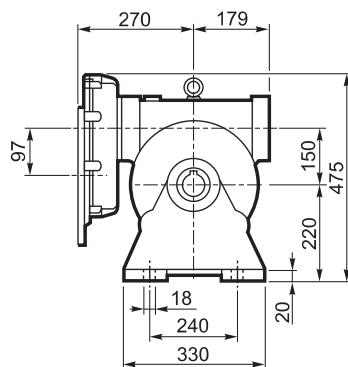
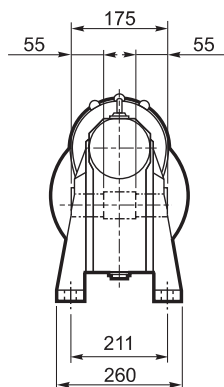
|        |         | M  | M1    | M2 | N   | N1  | N2  | N3 | N4 | Kg |
|--------|---------|----|-------|----|-----|-----|-----|----|----|----|
|        |         |    |       |    |     |     |     |    |    |    |
| VF 150 | P100 B5 | 28 | 31.3  | 8  | 250 | 215 | 180 | 11 | 13 | 60 |
| VF 150 | P112 B5 | 28 | 31.3  | 8  | 250 | 215 | 180 | 11 | 13 |    |
| VF 150 | P132 B5 | 38 | 41.3  | 10 | 300 | 265 | 230 | 16 | 13 |    |
| VF 150 | P160 B5 | 42 | 44.6# | 12 | 350 | 300 | 250 | 18 | 18 |    |

# Linguetta ribassata

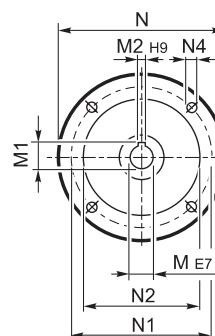
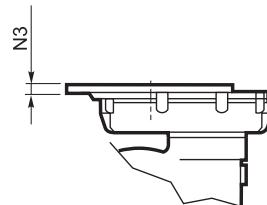


## VFR 150...P (IEC)

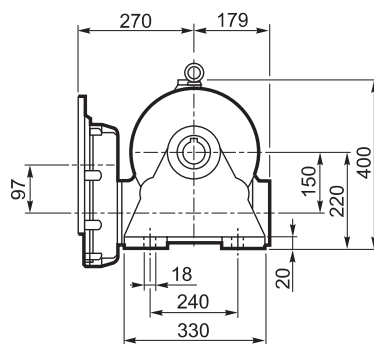
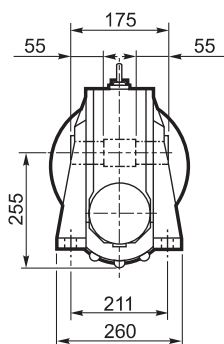
**A**



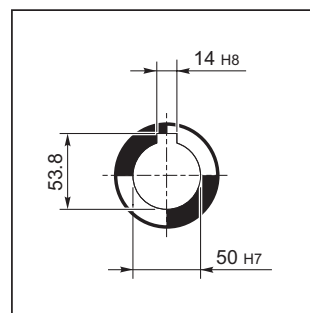
**INPUT**



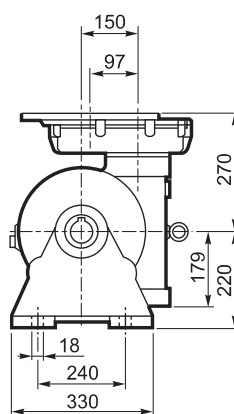
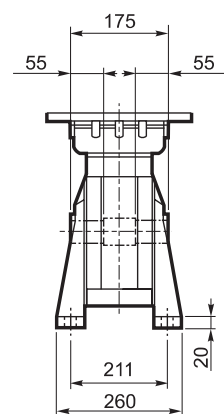
**N**

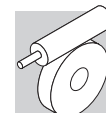


**OUTPUT**

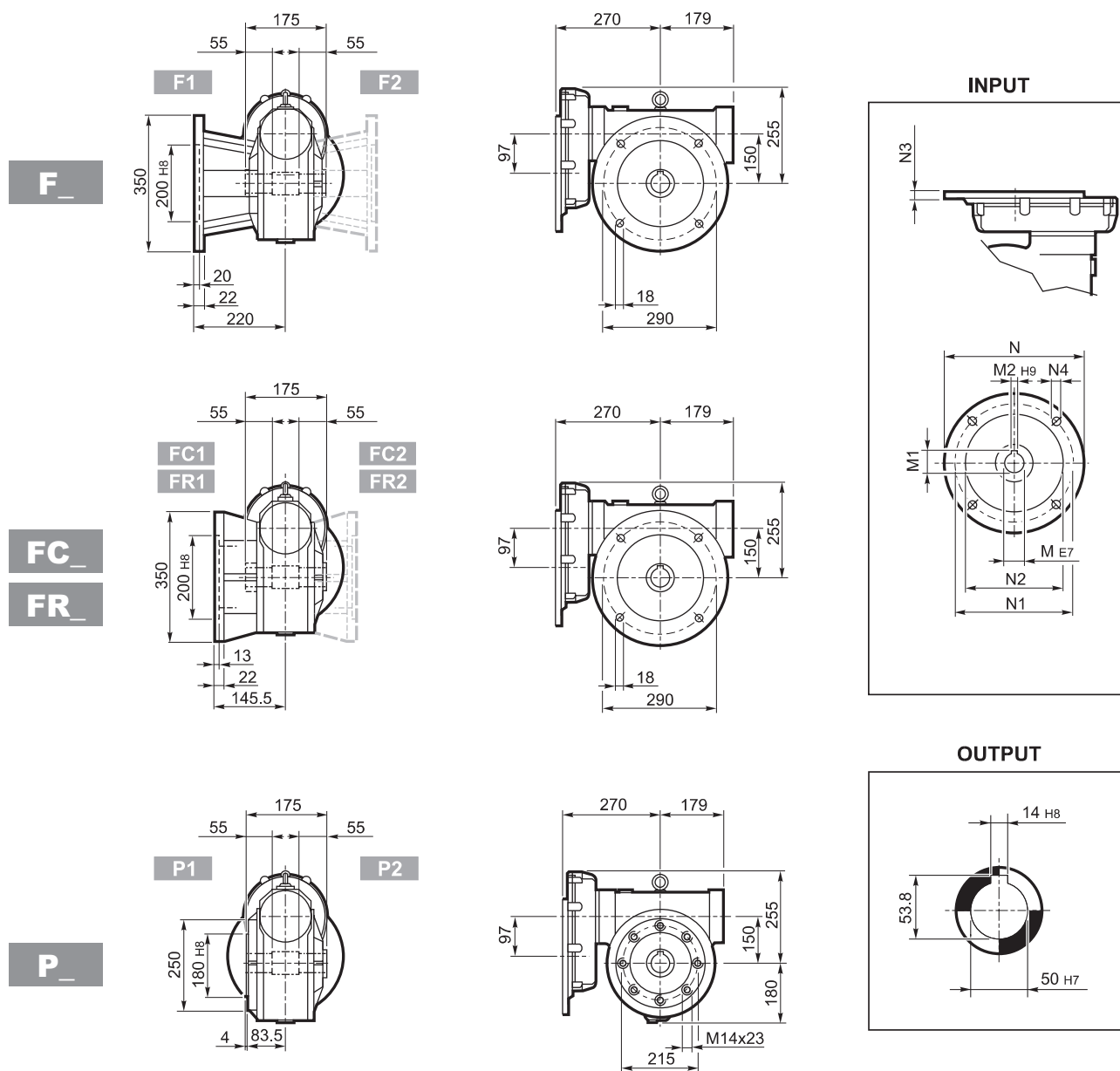


**V**



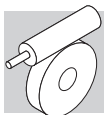


## VFR 150...P (IEC)



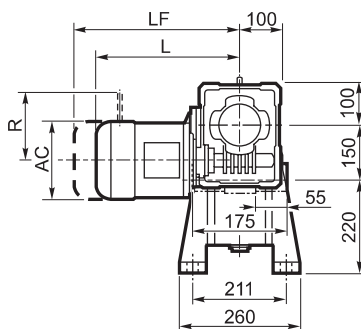
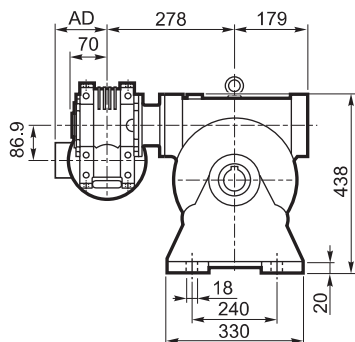
|         |         | M     | M1    | M2 | N   | N1  | N2  | N3 | N4     | Kg |
|---------|---------|-------|-------|----|-----|-----|-----|----|--------|----|
| VFR 150 | P90 B5  | 24 K6 | 27.3  | 8  | 200 | 165 | 130 | 13 | M10x25 | 71 |
| VFR 150 | P100 B5 | 28 K6 | 31.3  | 8  | 250 | 215 | 180 | 13 | M12x35 |    |
| VFR 150 | P112 B5 | 28 J6 | 31.3  | 8  | 250 | 215 | 180 | 13 | M12x35 |    |
| VFR 150 | P132 B5 | 38 J6 | 39.6# | 10 | 300 | 265 | 230 | 13 | M12x35 |    |

# Linguetta ribassata

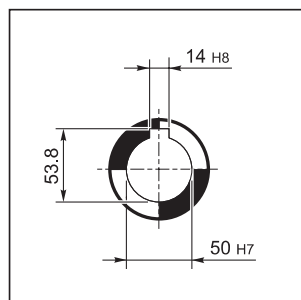


## W/VF 86/150...M

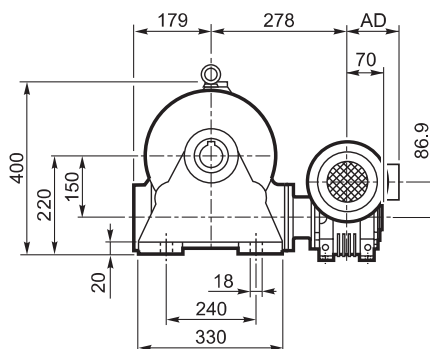
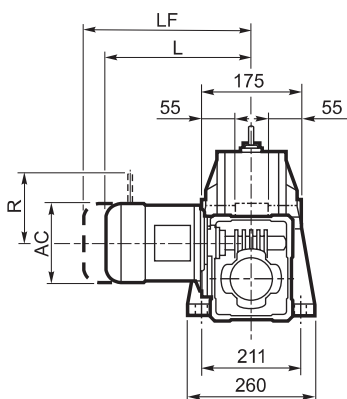
**A**



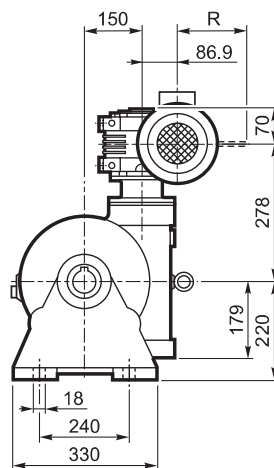
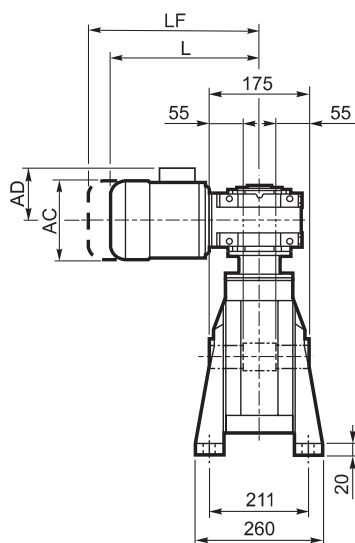
**OUTPUT**

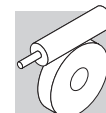


**N**



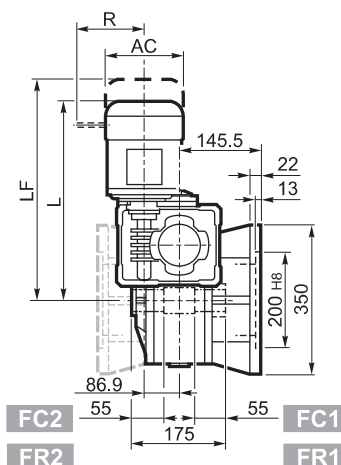
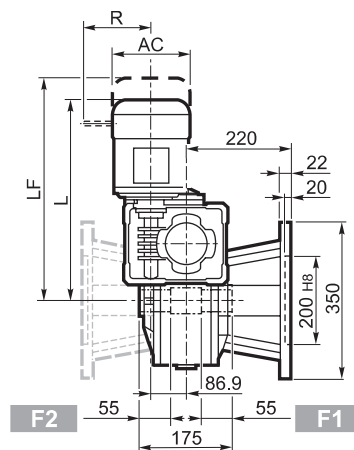
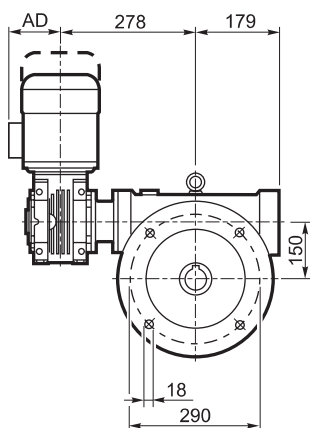
**V**



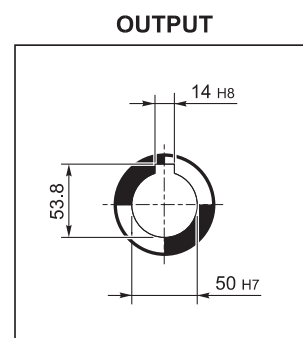
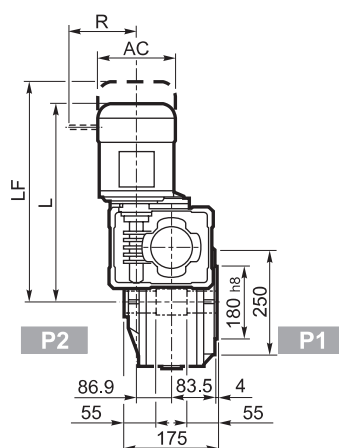
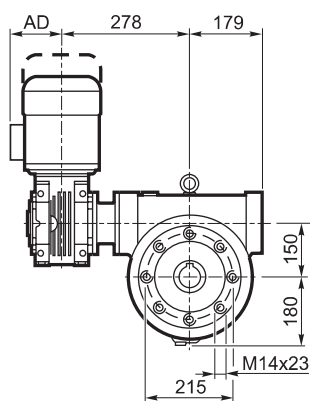


## W/VF 86/150...M

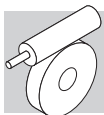
**F\_**  
**FC\_**  
**FR\_**



**P\_**

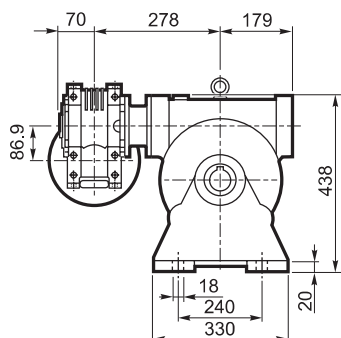


|                                                                                     |                                                                                     |                                                                                     | M_  |     |     |                                                                                     | M...FD<br>M...FA |                                                                                     | M...FD |     | M...FA |     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|-----|-----|-------------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------------|--------|-----|--------|-----|
|  |  |  | AC  | L   | AD  |  | LF               |  | R      | AD  | R      | AD  |
| W/VF 86/150                                                                         | S1                                                                                  | M1                                                                                  | 138 | 474 | 108 | 82                                                                                  | 385              | 84                                                                                  | 103    | 135 | 124    | 108 |
| W/VF 86/150                                                                         | S2                                                                                  | M2S                                                                                 | 156 | 499 | 119 | 86                                                                                  | 425              | 89                                                                                  | 129    | 146 | 134    | 119 |
| W/VF 86/150                                                                         | S3                                                                                  | M3S                                                                                 | 193 | 542 | 142 | 91                                                                                  | 488              | 97                                                                                  | 160    | 158 | 160    | 142 |
| W/VF 86/150                                                                         | S3                                                                                  | M3L                                                                                 | 193 | 574 | 142 | 99                                                                                  | 515              | 104                                                                                 | 160    | 158 | 160    | 142 |

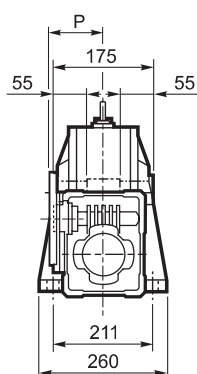


## W/VF 86/150...P (IEC)

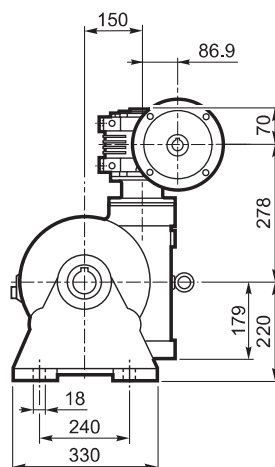
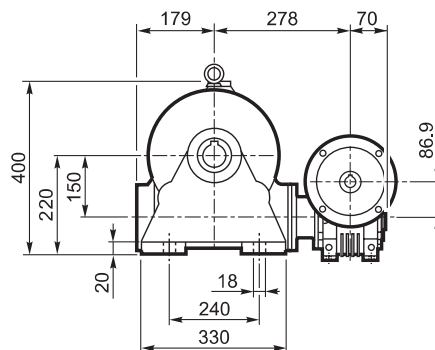
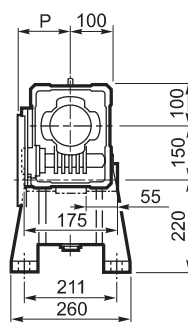
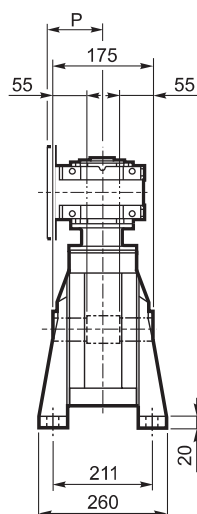
**A**



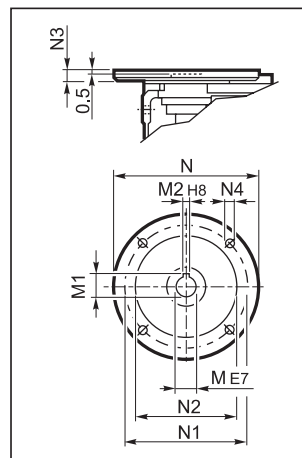
**N**



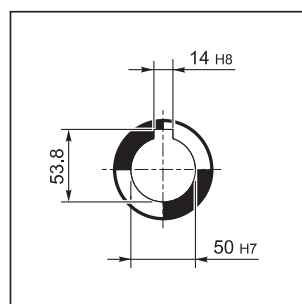
**V**

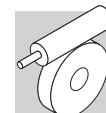


**INPUT**



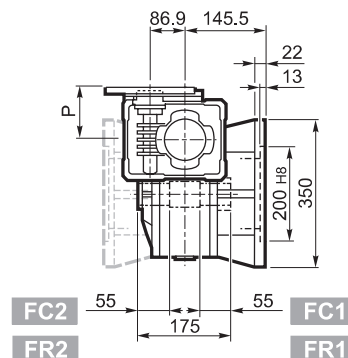
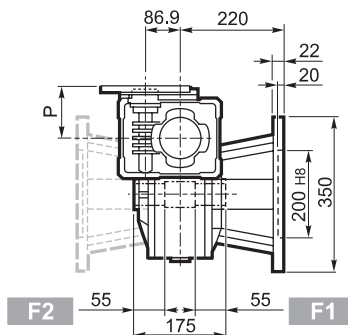
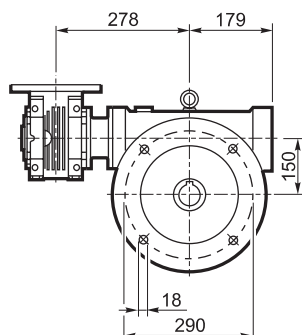
**OUTPUT**



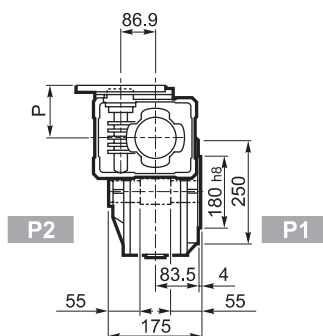
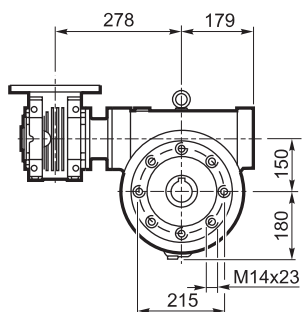


## W/VF 86/150...P (IEC)

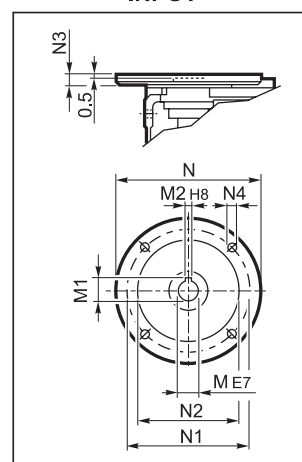
**F\_**  
**FC\_**  
**FR\_**



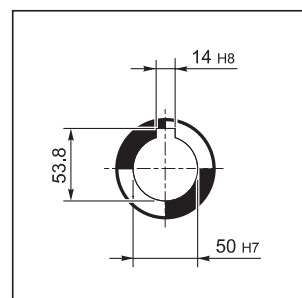
**P\_**



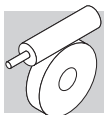
### INPUT



### OUTPUT

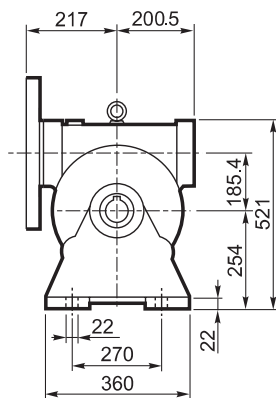
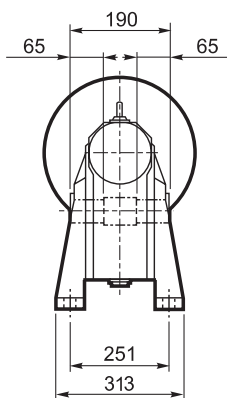


|                                                                                     |                                                                                     | M  | M1   | M2 | N   | N1  | N2  | N3  | N4   | P   | Kg |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|------|----|-----|-----|-----|-----|------|-----|----|
|  |  |    |      |    |     |     |     |     |      |     |    |
| W/VF 86/150                                                                         | P71 B5                                                                              | 14 | 16.3 | 5  | 160 | 130 | 110 | 11  | 9    | 128 | 75 |
| W/VF 86/150                                                                         | P80 B5                                                                              | 19 | 21.8 | 6  | 200 | 165 | 130 | 12  | 11.5 | 128 |    |
| W/VF 86/150                                                                         | P90 B5                                                                              | 24 | 27.3 | 8  | 200 | 165 | 130 | 12  | 11.5 | 128 |    |
| W/VF 86/150                                                                         | P100 B5                                                                             | 28 | 31.3 | 8  | 250 | 215 | 180 | 13  | 12.5 | 136 |    |
| W/VF 86/150                                                                         | P112 B5                                                                             | 28 | 31.3 | 8  | 250 | 215 | 180 | 13  | 12.5 | 136 |    |
| W/VF 86/150                                                                         | P80 B14                                                                             | 19 | 21.8 | 6  | 120 | 100 | 80  | 7.5 | 6.5  | 128 |    |
| W/VF 86/150                                                                         | P90 B14                                                                             | 24 | 27.3 | 8  | 140 | 115 | 95  | 7.5 | 8.5  | 128 |    |
| W/VF 86/150                                                                         | P100 B14                                                                            | 28 | 31.3 | 8  | 160 | 130 | 110 | 10  | 8.5  | 136 |    |
| W/VF 86/150                                                                         | P112 B14                                                                            | 28 | 31.3 | 8  | 160 | 130 | 110 | 10  | 8.5  | 136 |    |

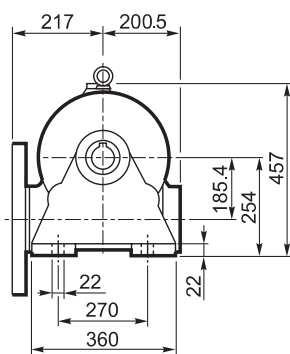
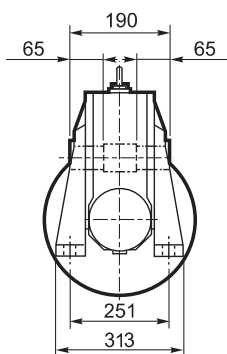


## VF 185...P (IEC)

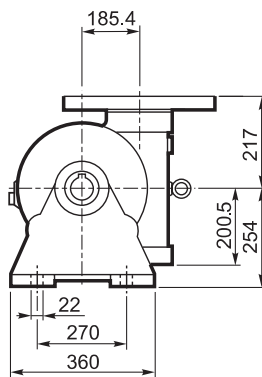
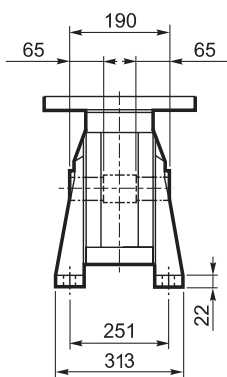
**A**



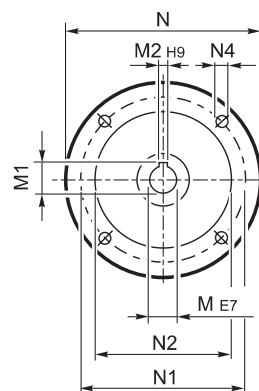
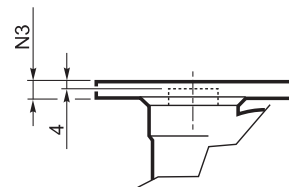
**N**



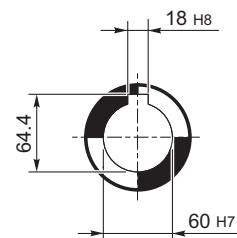
**V**

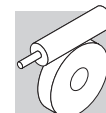


**INPUT**

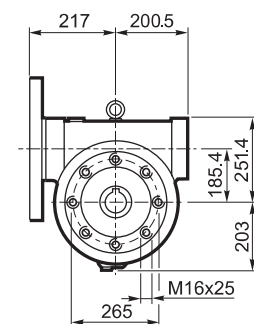
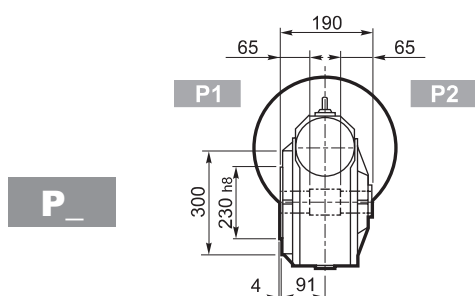
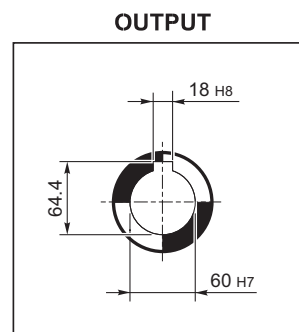
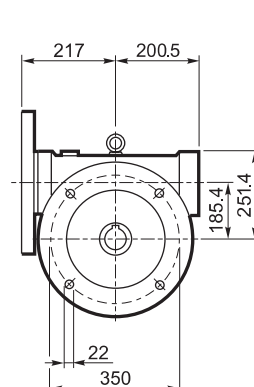
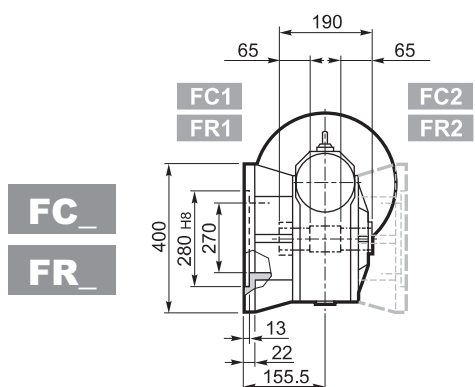
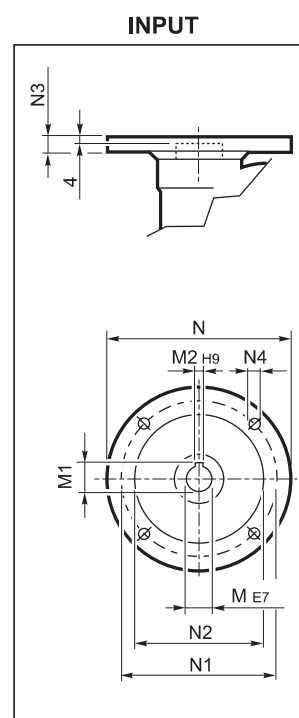
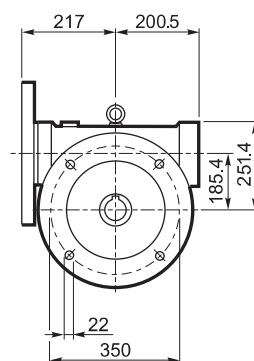
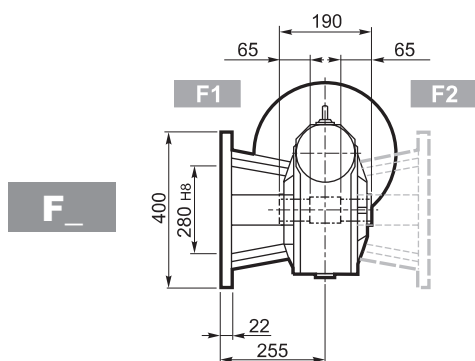


**OUTPUT**



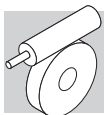


## VF 185...P (IEC)



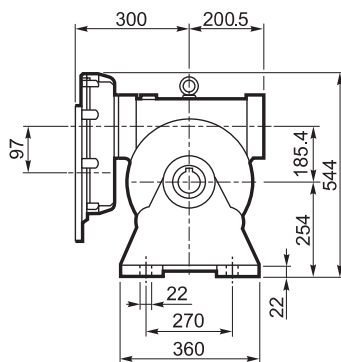
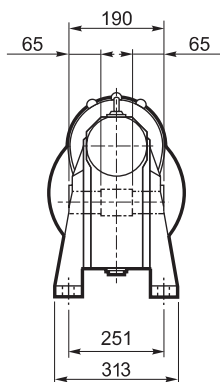
|        |         | M  | M1    | M2 | N   | N1  | N2  | N3 | N4 | kg |
|--------|---------|----|-------|----|-----|-----|-----|----|----|----|
|        |         |    |       |    |     |     |     |    |    |    |
| VF 185 | P100 B5 | 28 | 31.3  | 8  | 250 | 215 | 180 | 16 | 13 | 94 |
| VF 185 | P112 B5 | 28 | 31.3  | 8  | 250 | 215 | 180 | 16 | 13 |    |
| VF 185 | P132 B5 | 38 | 41.3  | 10 | 300 | 265 | 230 | 16 | 13 |    |
| VF 185 | P160 B5 | 42 | 45.3  | 12 | 350 | 300 | 250 | 18 | 18 |    |
| VF 185 | P180 B5 | 48 | 51.2# | 14 | 350 | 300 | 250 | 18 | 18 |    |

# Linguetta ribassata

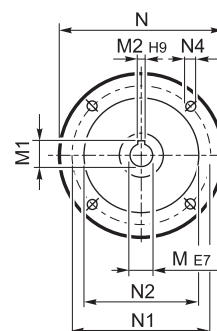
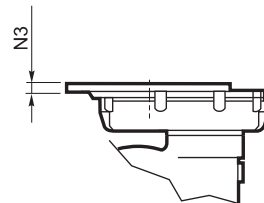


## VFR 185...P (IEC)

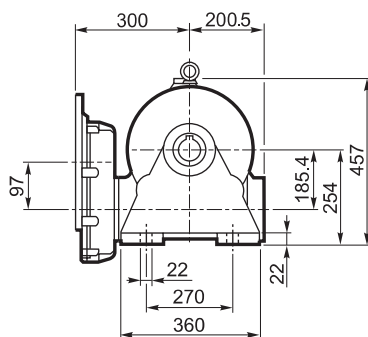
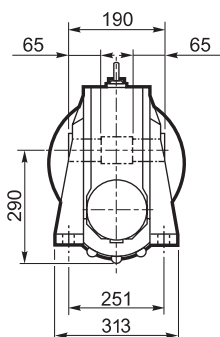
**A**



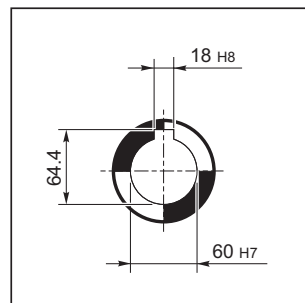
**INPUT**



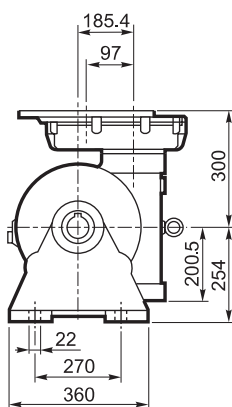
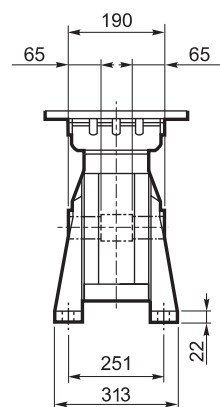
**N**

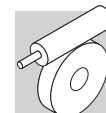


**OUTPUT**

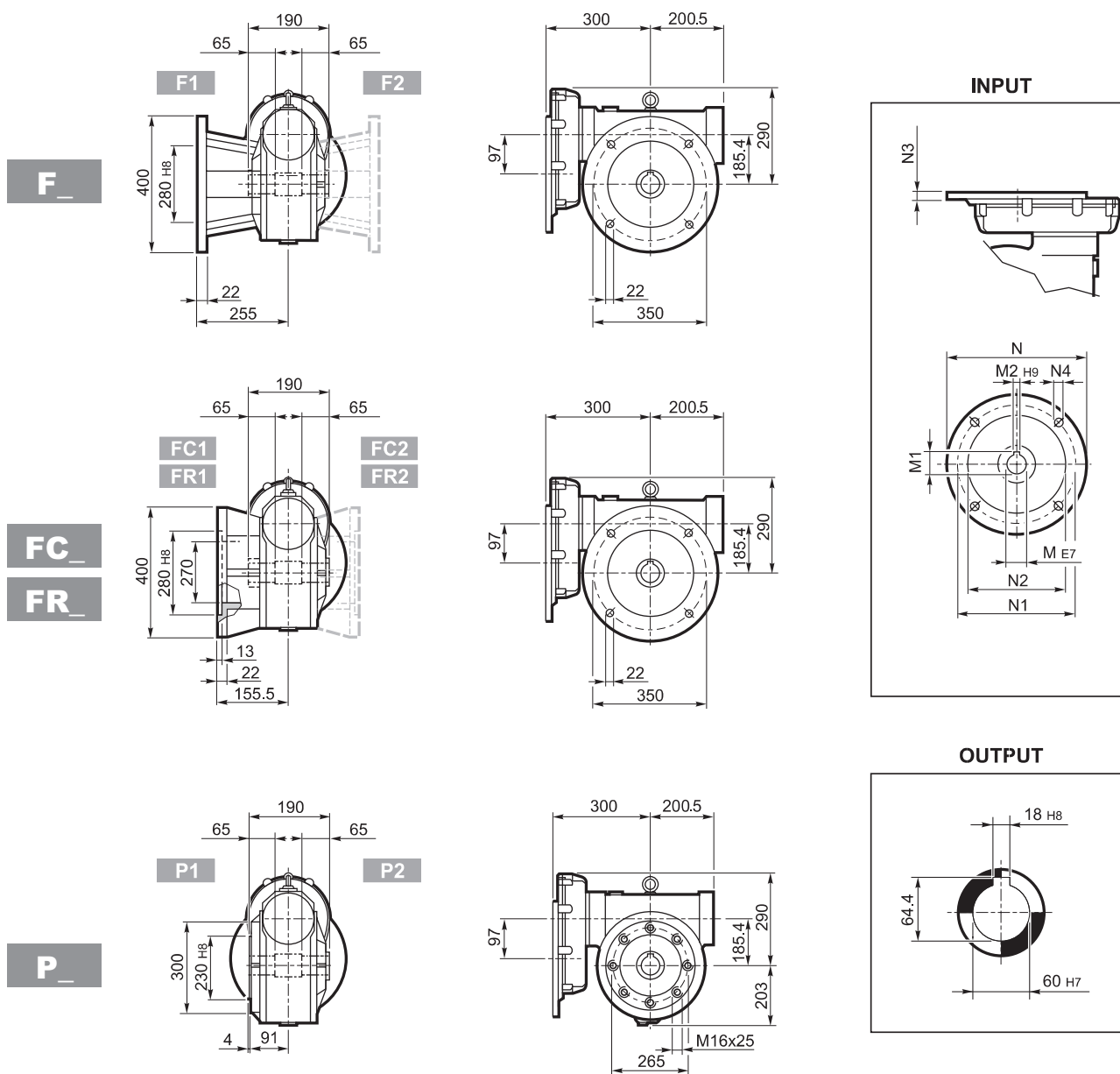


**V**



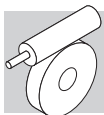


## VFR 185...P (IEC)



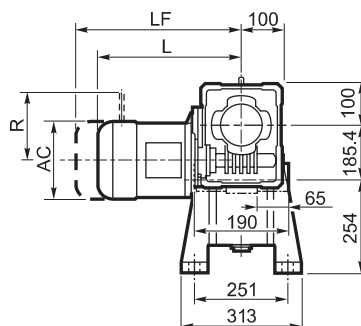
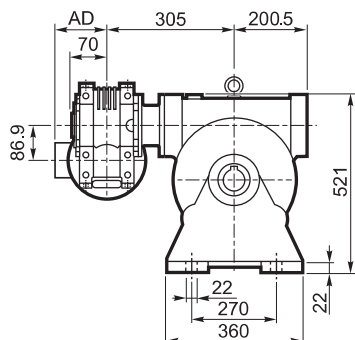
|                                                                                     |                                                                                     | M     | M1    | M2 | N   | N1  | N2  | N3 | N4     | Kg  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------|-------|----|-----|-----|-----|----|--------|-----|
|  |  |       |       |    |     |     |     |    |        |     |
| VFR 185                                                                             | P90 B5                                                                              | 24 K6 | 27.3  | 8  | 200 | 165 | 130 | 13 | M10x25 | 110 |
| VFR 185                                                                             | P100 B5                                                                             | 28 K6 | 31.3  | 8  | 250 | 215 | 180 | 13 | M12x35 |     |
| VFR 185                                                                             | P112 B5                                                                             | 28 K6 | 31.3  | 8  | 250 | 215 | 180 | 13 | M12x35 |     |
| VFR 185                                                                             | P132 B5                                                                             | 38 J6 | 39.6# | 10 | 300 | 265 | 230 | 13 | M12x35 |     |

# Linguetta ribassata

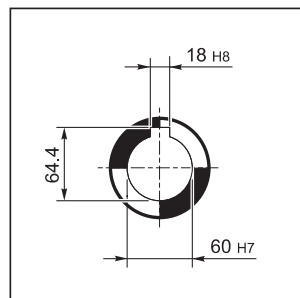


## W/VF 86/185...M

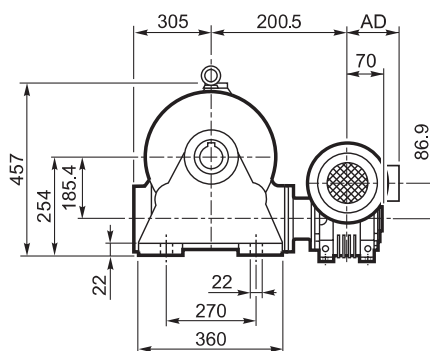
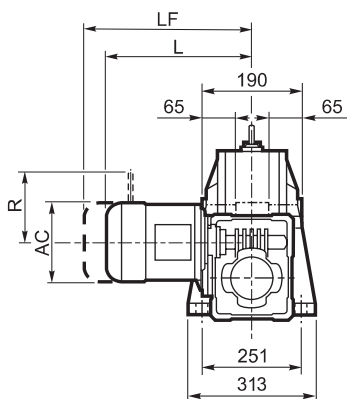
**A**



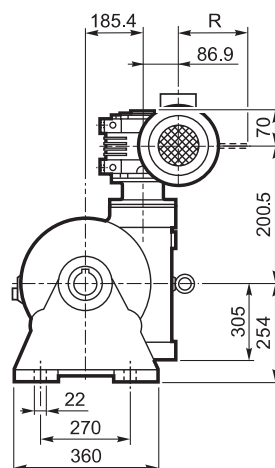
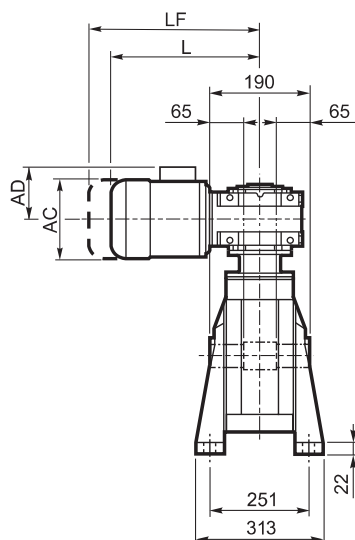
**OUTPUT**

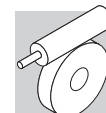


**N**



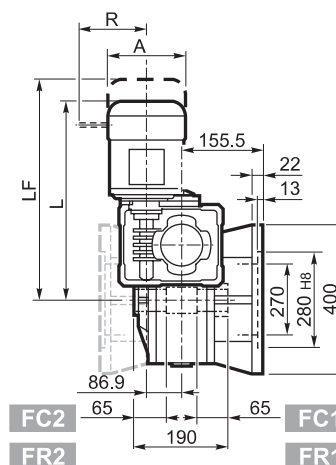
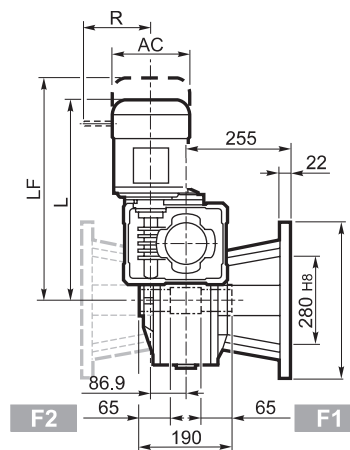
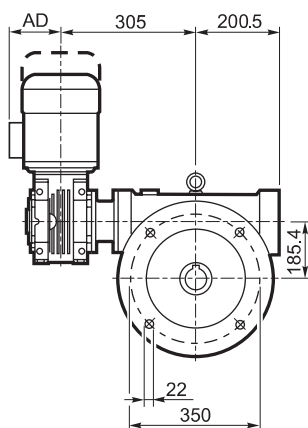
**V**



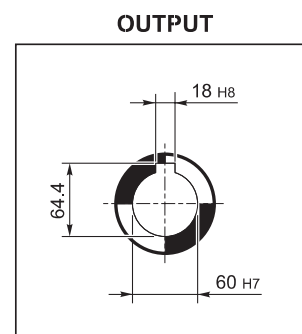
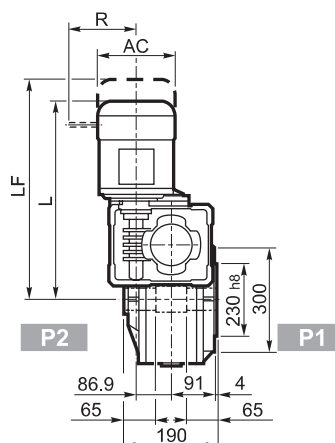
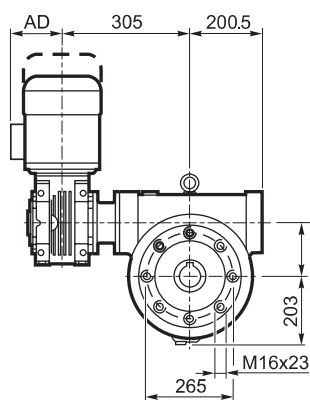


## W/VF 86/185...M

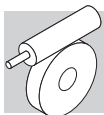
**F\_**  
**FC\_**  
**FR\_**



**P\_**

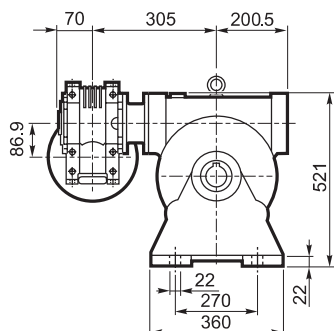


|                                                                                     |                                                                                     |                                                                                     | M_  |     |     |                                                                                     | M...FD<br>M...FA |                                                                                     | M...FD |     | M...FA |     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|-----|-----|-------------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------------|--------|-----|--------|-----|
|  |  |  | AC  | L   | AD  |  | LF               |  | R      | AD  | R      | AD  |
| W/VF 86/185                                                                         | S1                                                                                  | M1                                                                                  | 138 | 509 | 108 | 116                                                                                 | 570              | 118                                                                                 | 103    | 135 | 124    | 108 |
| W/VF 86/185                                                                         | S2                                                                                  | M2S                                                                                 | 156 | 534 | 119 | 120                                                                                 | 610              | 123                                                                                 | 129    | 146 | 134    | 119 |
| W/VF 86/185                                                                         | S3                                                                                  | M3S                                                                                 | 193 | 577 | 142 | 125                                                                                 | 673              | 131                                                                                 | 160    | 158 | 160    | 142 |
| W/VF 86/185                                                                         | S3                                                                                  | M3L                                                                                 | 193 | 609 | 142 | 133                                                                                 | 700              | 138                                                                                 | 160    | 158 | 160    | 142 |

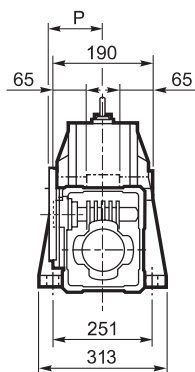


## W/VF 86/185...P (IEC)

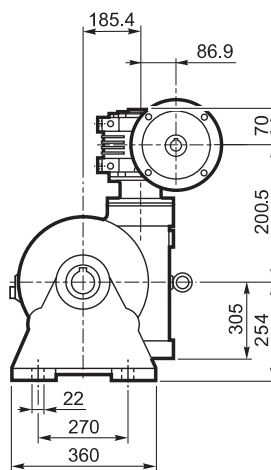
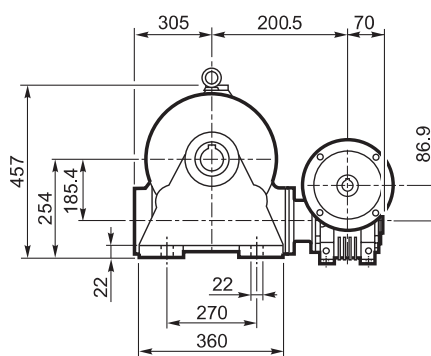
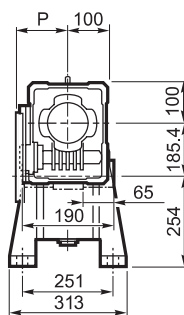
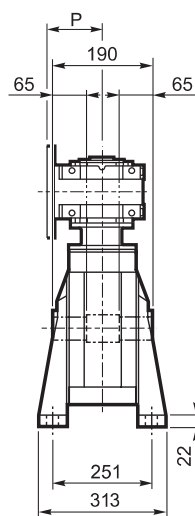
**A**



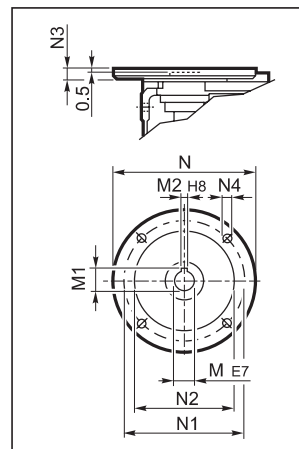
**N**



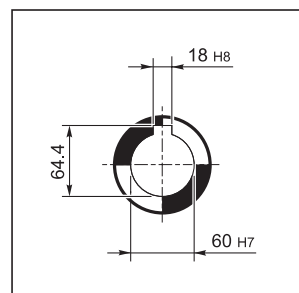
**V**

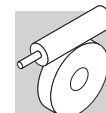


### INPUT



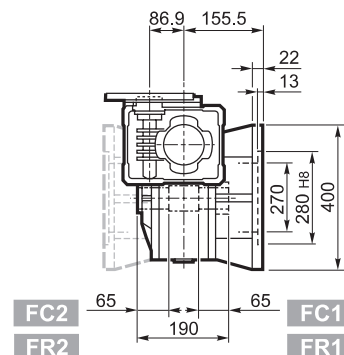
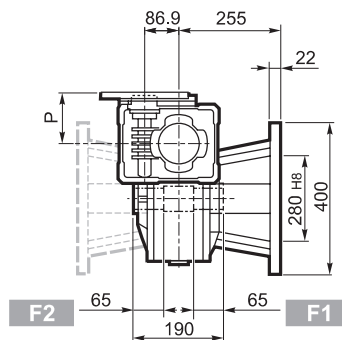
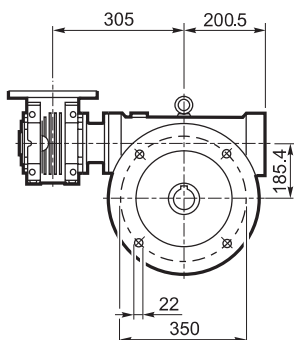
### OUTPUT



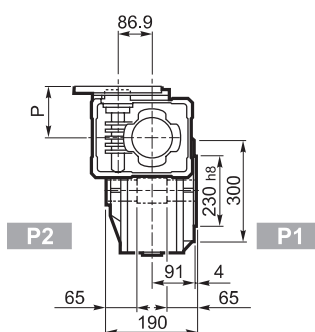
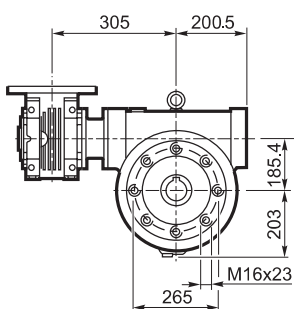


## W/VF 86/185...P (IEC)

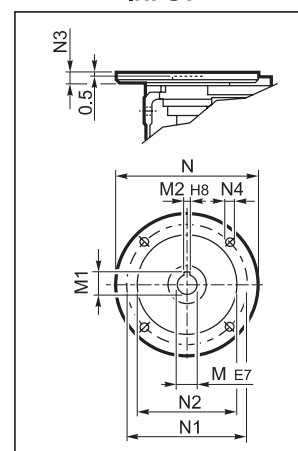
**F\_**  
**FC\_**  
**FR\_**



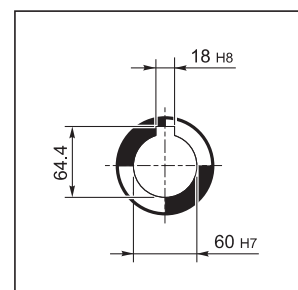
**P\_**



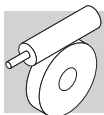
### INPUT



### OUTPUT

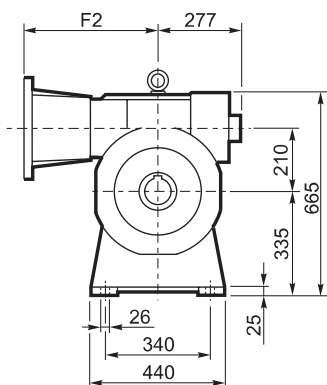
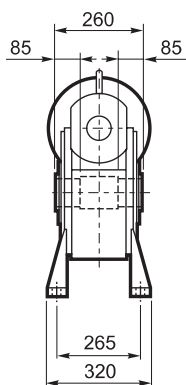


|                                                                                     |                                                                                     | M  | M1   | M2 | N   | N1  | N2  | N3  | N4   | P   | Kg  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|------|----|-----|-----|-----|-----|------|-----|-----|
|  |  |    |      |    |     |     |     |     |      |     |     |
| W/VF 86/185                                                                         | P71 B5                                                                              | 14 | 16.3 | 5  | 160 | 130 | 110 | 11  | 9    | 128 | 109 |
| W/VF 86/185                                                                         | P80 B5                                                                              | 19 | 21.8 | 6  | 200 | 165 | 130 | 12  | 11.5 | 128 |     |
| W/VF 86/185                                                                         | P90 B5                                                                              | 24 | 27.3 | 8  | 200 | 165 | 130 | 12  | 11.5 | 128 |     |
| W/VF 86/185                                                                         | P100 B5                                                                             | 28 | 31.3 | 8  | 250 | 215 | 180 | 13  | 12.5 | 136 |     |
| W/VF 86/185                                                                         | P112 B5                                                                             | 28 | 31.3 | 8  | 250 | 215 | 180 | 13  | 12.5 | 136 |     |
| W/VF 86/185                                                                         | P80 B14                                                                             | 19 | 21.8 | 6  | 120 | 100 | 80  | 7.5 | 6.5  | 128 |     |
| W/VF 86/185                                                                         | P90 B14                                                                             | 24 | 27.3 | 8  | 140 | 115 | 95  | 7.5 | 8.5  | 128 |     |
| W/VF 86/185                                                                         | P100 B14                                                                            | 28 | 31.3 | 8  | 160 | 130 | 110 | 10  | 8.5  | 136 |     |
| W/VF 86/185                                                                         | P112 B14                                                                            | 28 | 31.3 | 8  | 160 | 130 | 110 | 10  | 8.5  | 136 |     |

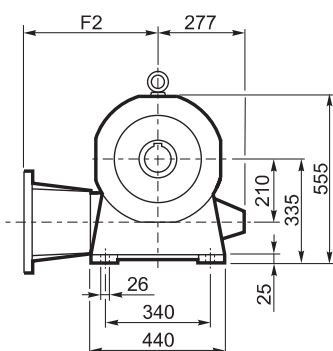
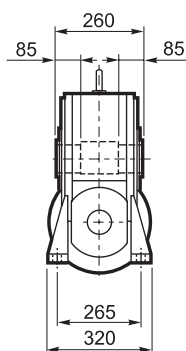


## VF 210...P (IEC)

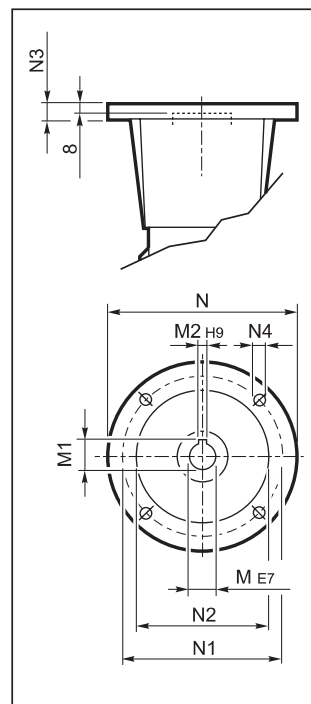
**A**



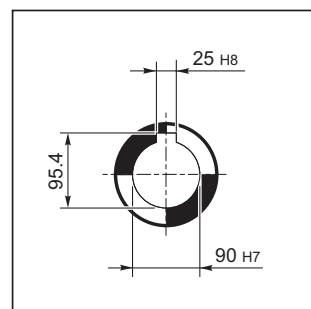
**N**

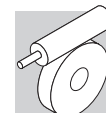


### INPUT



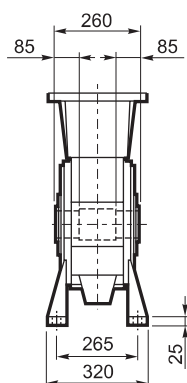
### OUTPUT



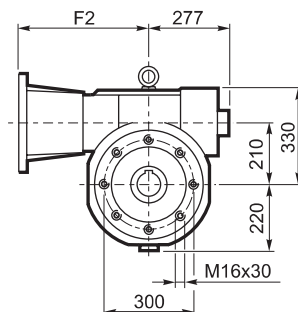
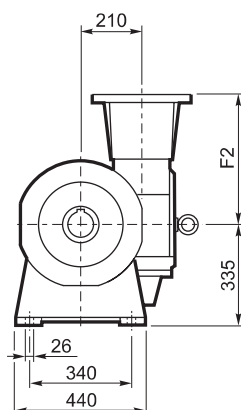
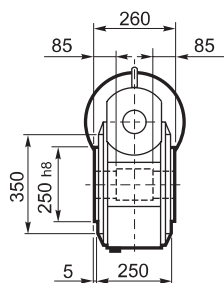


## VF 210...P (IEC)

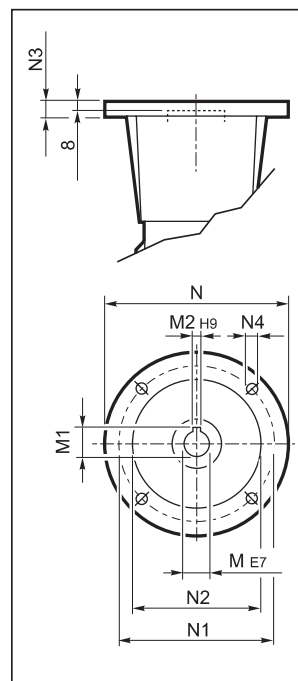
**V**



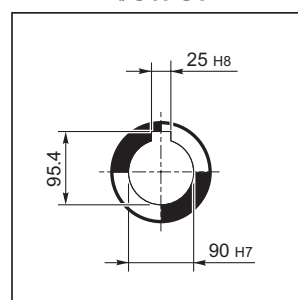
**P**



**INPUT**



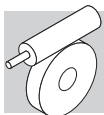
**OUTPUT**



Nelle forme costruttive A e P viene montata la ventola di raffreddamento.  
Nell'esecuzione P(IEC) è prevista di serie la fornitura del giunto completo per attacco motore.

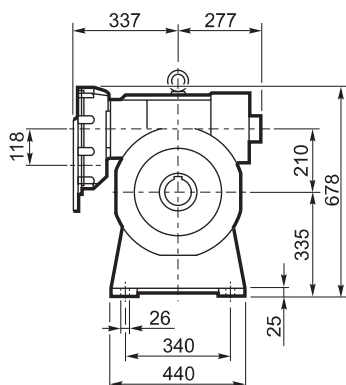
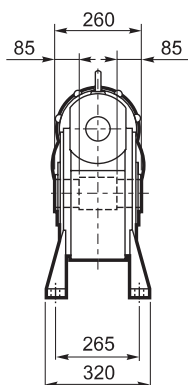
|        |         | F2  | M  | M1   | M2 | N   | N1  | N2  | N3 | N4   | kg  |
|--------|---------|-----|----|------|----|-----|-----|-----|----|------|-----|
|        |         |     |    |      |    |     |     |     |    |      |     |
| VF 210 | P132 B5 | 485 | 38 | 41.3 | 10 | 300 | 265 | 230 | 25 | M12  | 210 |
| VF 210 | P160 B5 | 460 | 42 | 45.3 | 12 | 350 | 300 | 250 | 22 | 18   |     |
| VF 210 | P180 B5 | 460 | 48 | 51.8 | 14 | 350 | 300 | 250 | 22 | 18   |     |
| VF 210 | P200 B5 | 485 | 55 | 59.3 | 16 | 400 | 350 | 300 | 25 | M16  |     |
| VF 210 | P225 B5 | 490 | 60 | 64.4 | 18 | 450 | 400 | 350 | 22 | 18 # |     |

# N° 8 fori a 45°

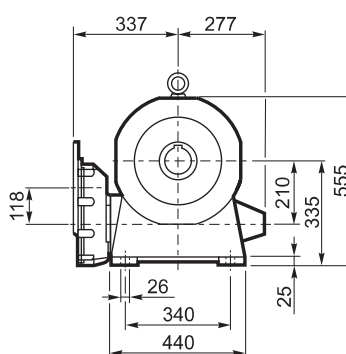
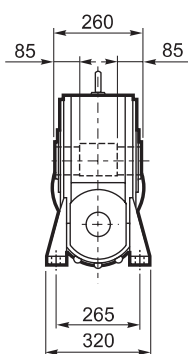


## VFR 210...P (IEC)

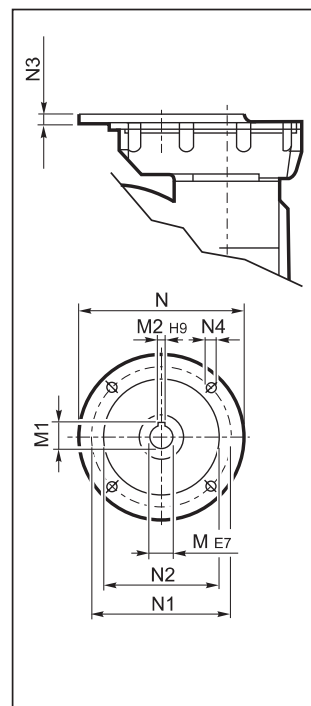
**A**



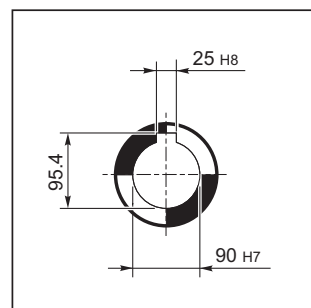
**N**

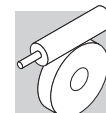


### INPUT



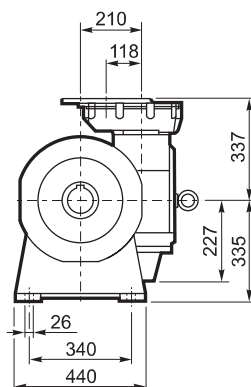
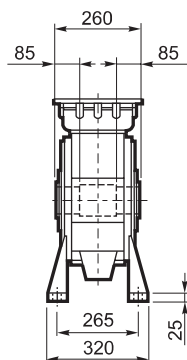
### OUTPUT



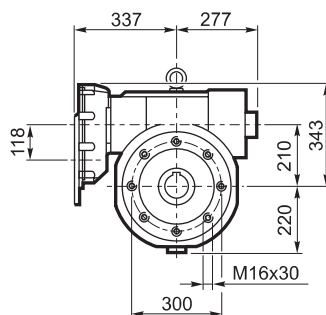
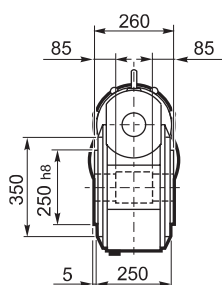


## VFR 210...P (IEC)

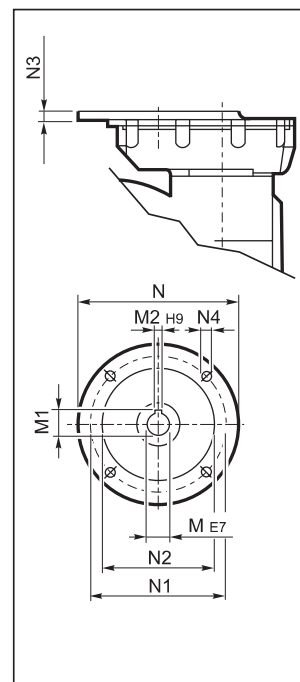
**V**



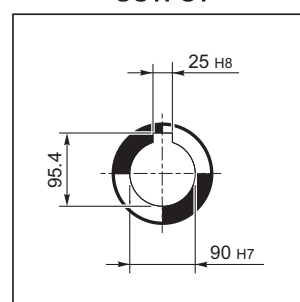
**P**



**INPUT**



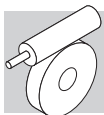
**OUTPUT**



Nelle forme costruttive A e P viene montata la ventola di raffreddamento.

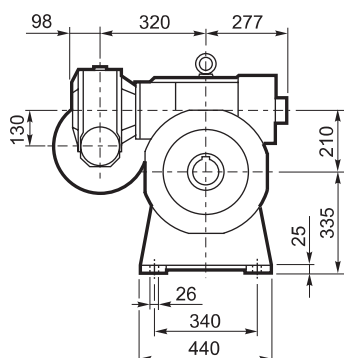
|         |         | M     | M1    | M2 | N   | N1  | N2  | N3 | N4     | Kg  |
|---------|---------|-------|-------|----|-----|-----|-----|----|--------|-----|
|         |         |       |       |    |     |     |     |    |        |     |
| VFR 210 | P100 B5 | 28 K6 | 31.3  | 8  | 250 | 215 | 180 | 13 | M12x35 | 185 |
| VFR 210 | P112 B5 | 28 K6 | 31.3  | 8  | 250 | 215 | 180 | 13 | M12x35 |     |
| VFR 210 | P132 B5 | 38 J6 | 41.3  | 10 | 300 | 265 | 230 | 13 | M12x35 |     |
| VFR 210 | P160 B5 | 42 J6 | 44.3# | 12 | 350 | 300 | 250 | 18 | M16x60 |     |

# Linguetta ribassata

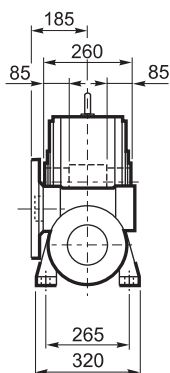


## VF/VF 130/210...P (IEC)

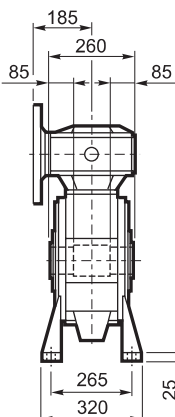
**A**



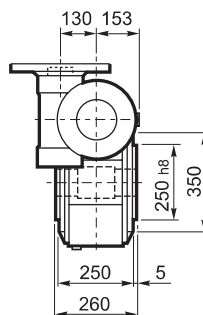
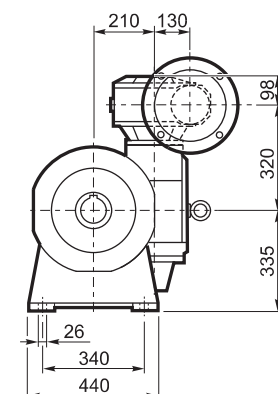
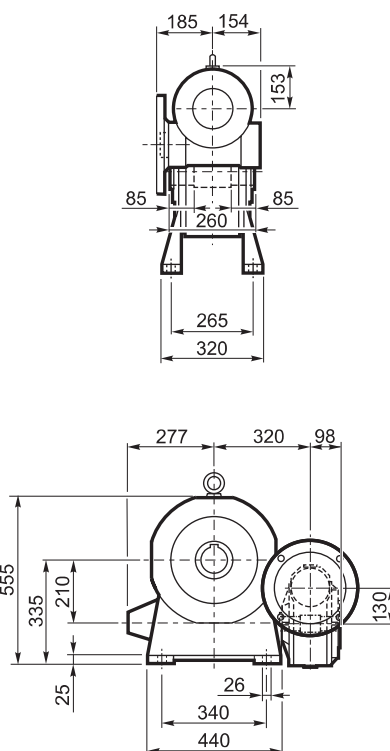
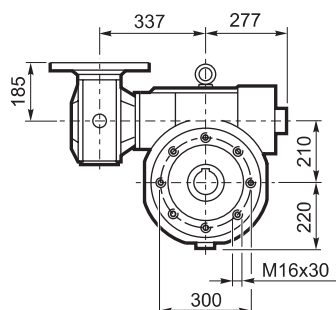
**N**



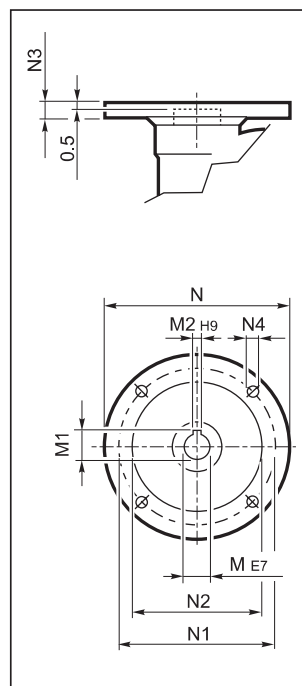
**V**



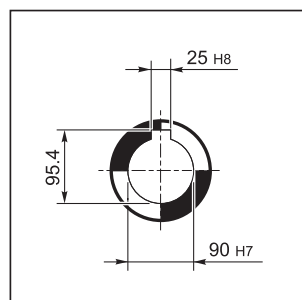
**P**



**INPUT**



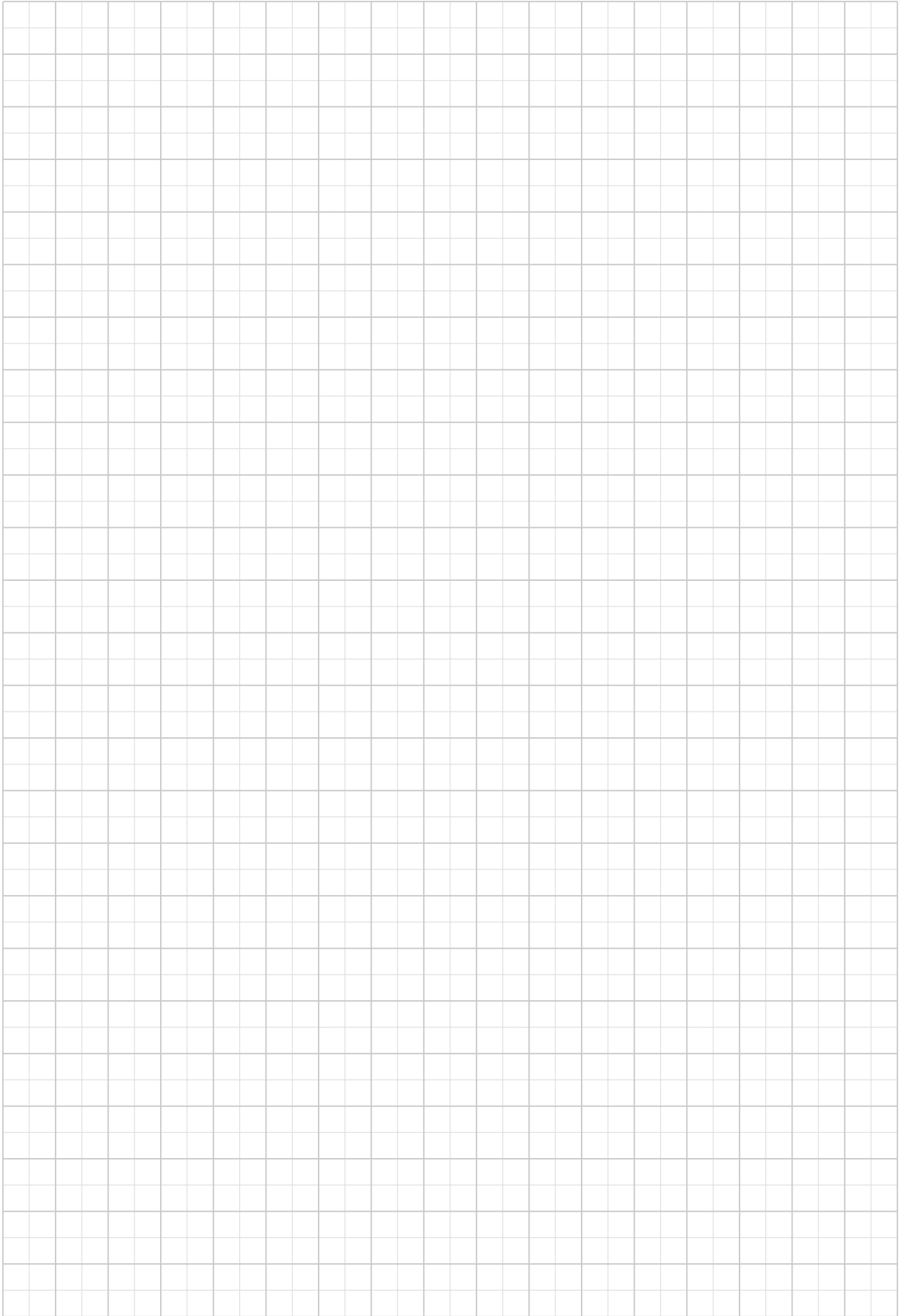
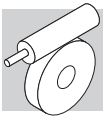
**OUTPUT**

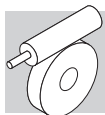


Nelle forme costruttive A e P viene montata la ventola di raffreddamento.

|               |         | M  | M1    | M2 | N   | N1  | N2  | N3 | N4 | Kg  |
|---------------|---------|----|-------|----|-----|-----|-----|----|----|-----|
|               |         |    |       |    |     |     |     |    |    |     |
| VF/VF 130/210 | P90 B5  | 24 | 27.3  | 8  | 200 | 165 | 130 | 17 | 11 | 225 |
| VF/VF 130/210 | P100 B5 | 28 | 31.3  | 8  | 250 | 215 | 180 | 17 | 13 |     |
| VF/VF 130/210 | P112 B5 | 28 | 31.3  | 8  | 250 | 215 | 180 | 17 | 13 |     |
| VF/VF 130/210 | P132 B5 | 38 | 40.1# | 10 | 300 | 265 | 230 | 17 | 13 |     |

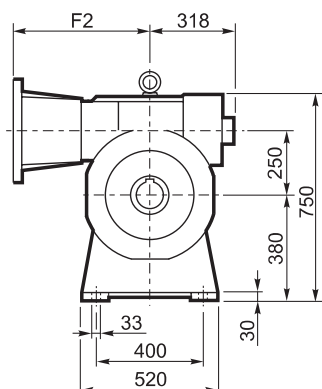
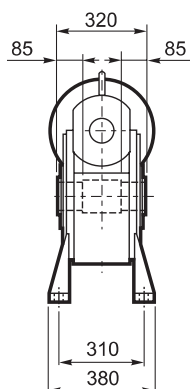
# Linguetta ribassata



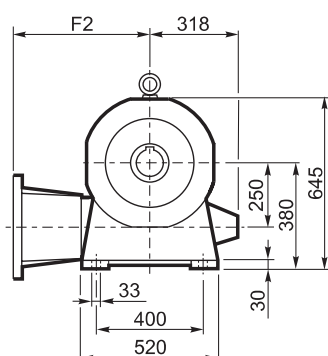
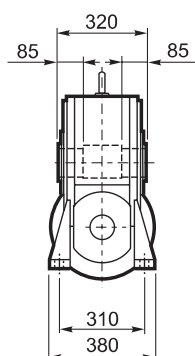


## VF 250...P (IEC)

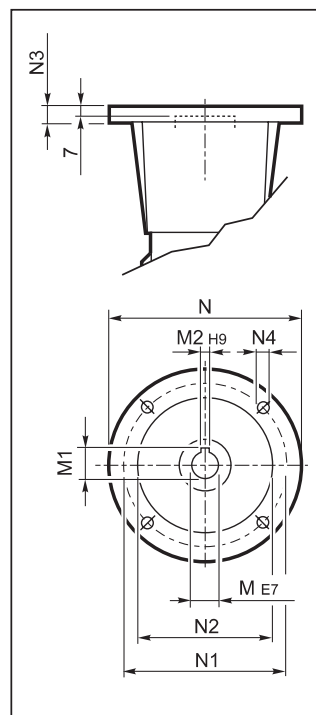
**A**



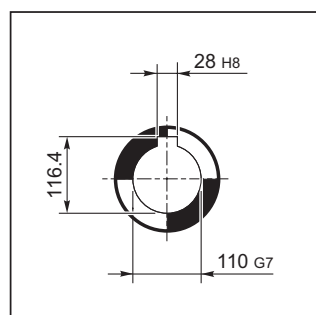
**N**

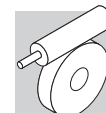


### INPUT



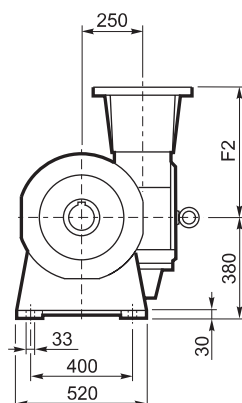
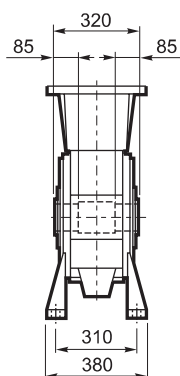
### OUTPUT



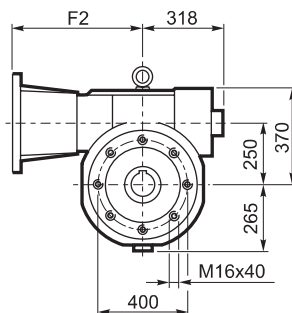
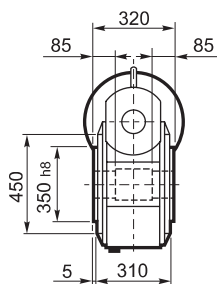


## VF 250...P (IEC)

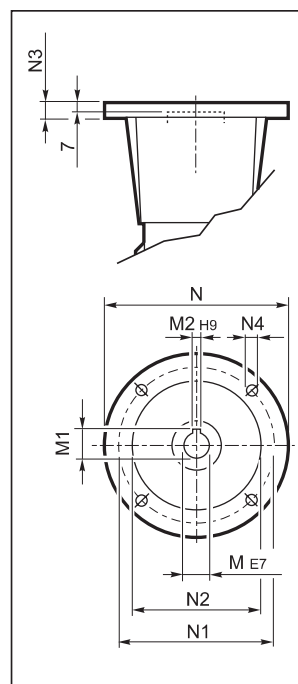
**V**



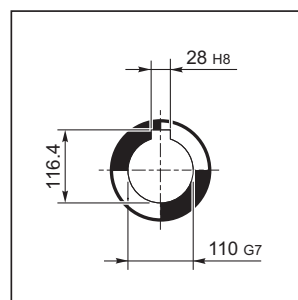
**P**



### INPUT



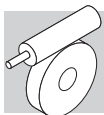
### OUTPUT



Nelle forme costruttive A e P viene montata la ventola di raffreddamento.  
Nell'esecuzione P(IEC) è prevista di serie la fornitura del giunto completo per attacco motore.

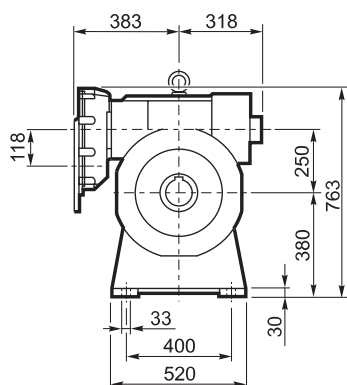
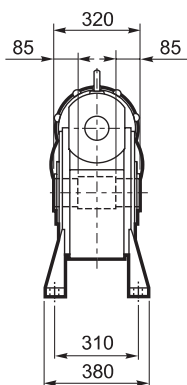
|        |         | F2  | M  | M1   | M2 | N   | N1  | N2  | N3 | N4  | Kg  |
|--------|---------|-----|----|------|----|-----|-----|-----|----|-----|-----|
|        |         |     |    |      |    |     |     |     |    |     |     |
| VF 250 | P132 B5 | 531 | 38 | 41.3 | 10 | 300 | 265 | 230 | 25 | M12 | 310 |
| VF 250 | P160 B5 | 506 | 42 | 45.3 | 12 | 350 | 300 | 250 | 22 | 18  |     |
| VF 250 | P180 B5 | 506 | 48 | 51.8 | 14 | 350 | 300 | 250 | 22 | 18  |     |
| VF 250 | P200 B5 | 531 | 55 | 59.3 | 16 | 400 | 350 | 300 | 25 | M16 |     |
| VF 250 | P225 B5 | 536 | 60 | 64.4 | 18 | 450 | 400 | 350 | 22 | 18# |     |

# N° 8 fori a 45°

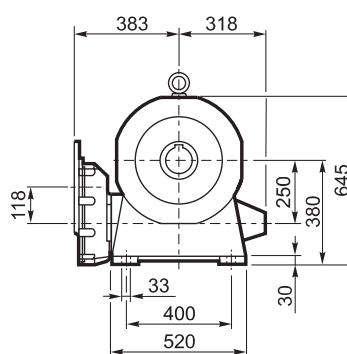
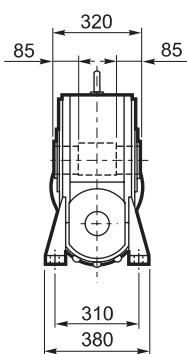


## VFR 250...P (IEC)

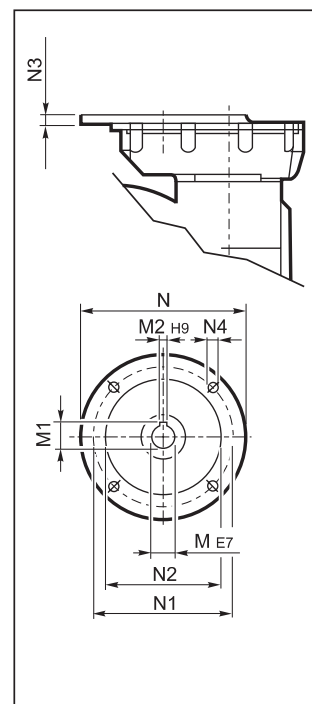
**A**



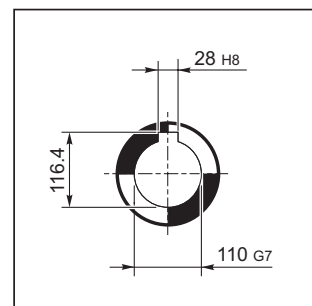
**N**

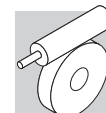


### INPUT



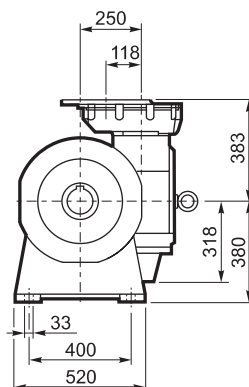
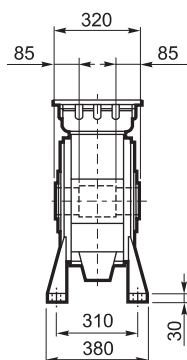
### OUTPUT



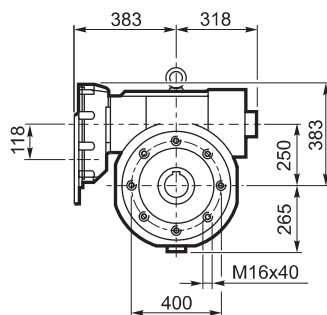
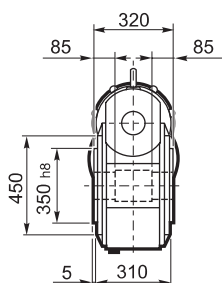


## VFR 250...P (IEC)

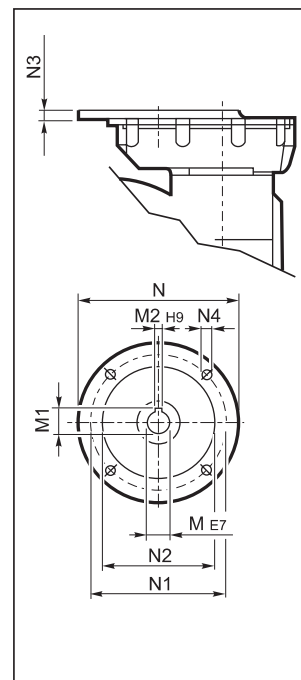
**V**



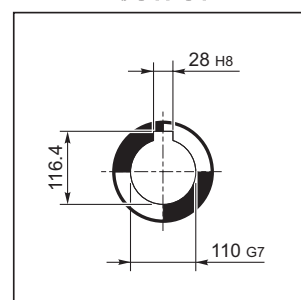
**P**



**INPUT**



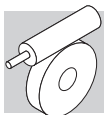
**OUTPUT**



Nelle forme costruttive A e P viene montata la ventola di raffreddamento.

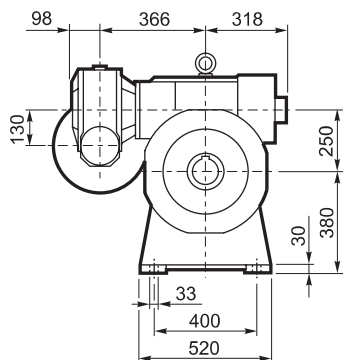
|  |  | M     | M1    | M2 | N   | N1  | N2  | N3 | N4     |  Kg |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------|-------|----|-----|-----|-----|----|--------|------------------------------------------------------------------------------------------|
| VFR 250                                                                             | P100 B5                                                                             | 28 K6 | 31.3  | 8  | 250 | 215 | 180 | 13 | M12x35 | 295                                                                                      |
| VFR 250                                                                             | P112 B5                                                                             | 28 K6 | 31.3  | 8  | 250 | 215 | 180 | 13 | M12x35 |                                                                                          |
| VFR 250                                                                             | P132 B5                                                                             | 38 J6 | 41.3  | 10 | 300 | 265 | 230 | 13 | M12x35 |                                                                                          |
| VFR 250                                                                             | P160 B5                                                                             | 42 J6 | 44.3# | 12 | 350 | 300 | 250 | 18 | M16x60 |                                                                                          |

# Linguetta ribassata

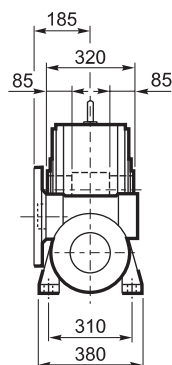


## VF/VF 130/250...P (IEC)

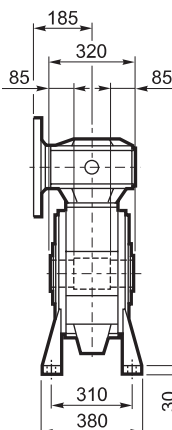
**A**



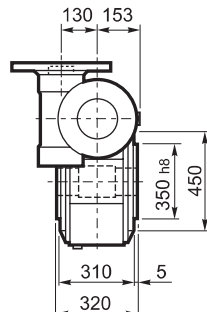
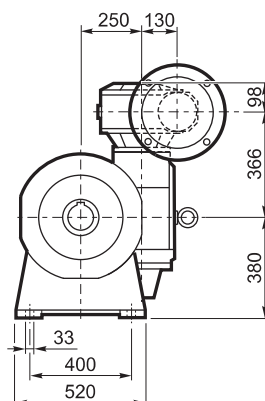
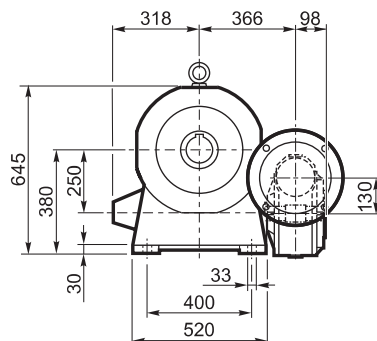
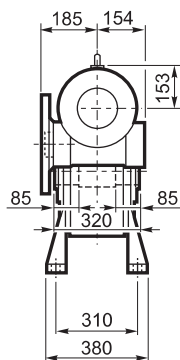
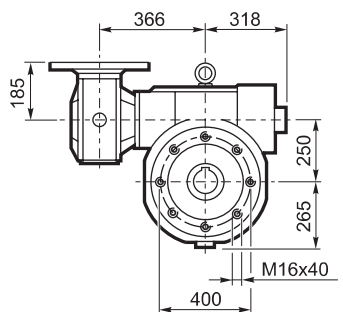
**N**



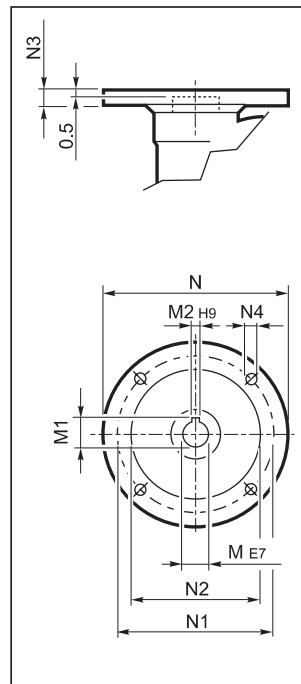
**V**



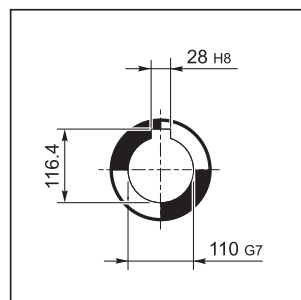
**P**



**INPUT**



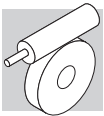
**OUTPUT**



Nelle forme costruttive A e P viene montata la ventola di raffreddamento.

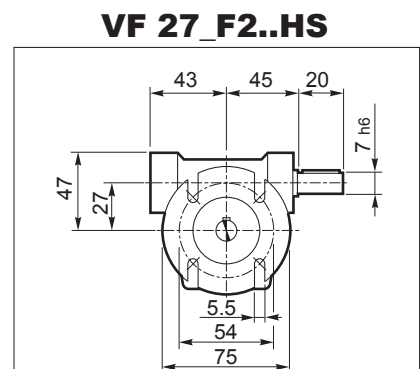
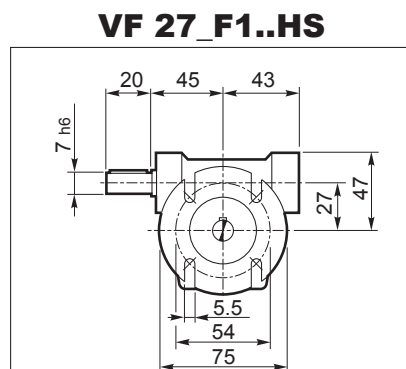
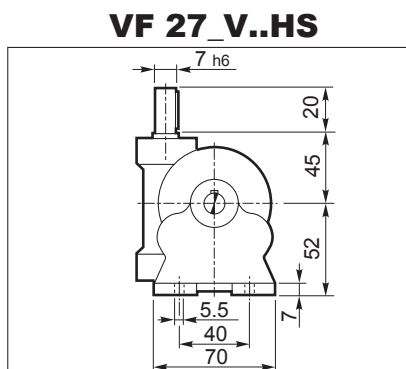
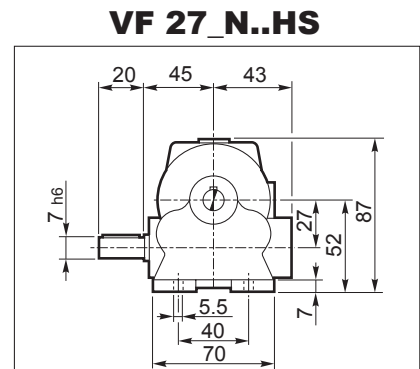
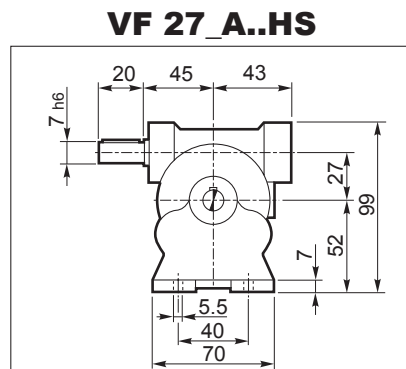
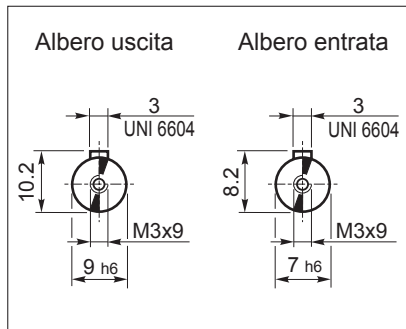
|               |         | M  | M1    | M2 | N   | N1  | N2  | N3 | N4 | Kg  |
|---------------|---------|----|-------|----|-----|-----|-----|----|----|-----|
| VF/VF 130/250 | P 90 B5 | 24 | 27.3  | 8  | 200 | 165 | 130 | 17 | 11 | 325 |
| VF/VF 130/250 | P100 B5 | 28 | 31.3  | 8  | 250 | 215 | 180 | 17 | 13 |     |
| VF/VF 130/250 | P112 B5 | 28 | 31.3  | 8  | 250 | 215 | 180 | 17 | 13 |     |
| VF/VF 130/250 | P132 B5 | 38 | 40.1# | 10 | 300 | 265 | 230 | 17 | 13 |     |

# Linguetta ribassata



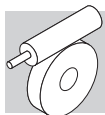
## 27 DIMENSIONI RIDUTTORI CON INGRESSO HS

### VF 27...HS



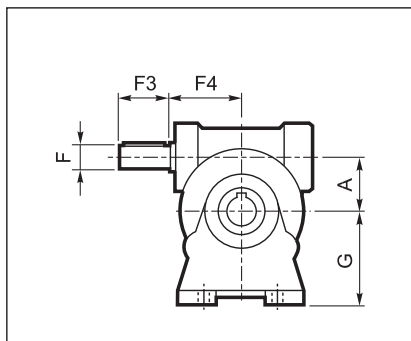
|          |      |
|----------|------|
|          |      |
| VF 27_HS | 0.73 |

Le dimensioni comuni alle altre configurazioni sono riportate a pag.111.

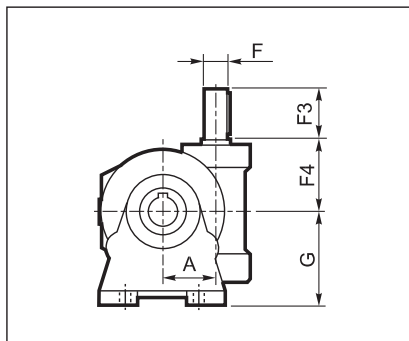


## VF...HS - W...HS

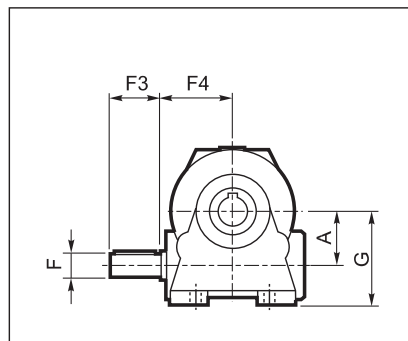
**VF\_A..HS**



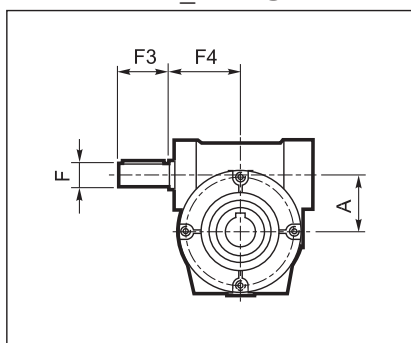
**VF\_V..HS**



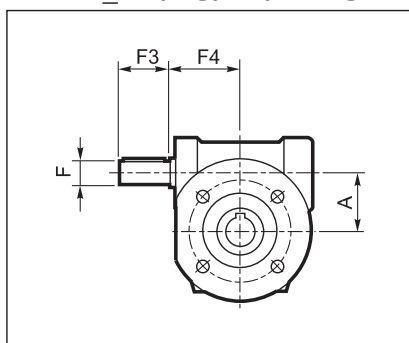
**VF\_N..HS**



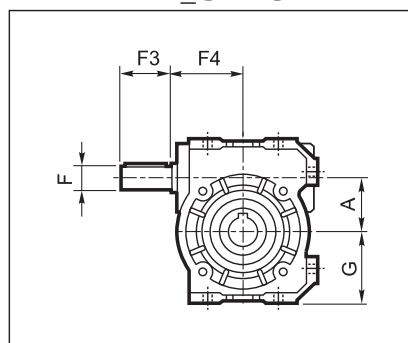
**VF\_P..HS**



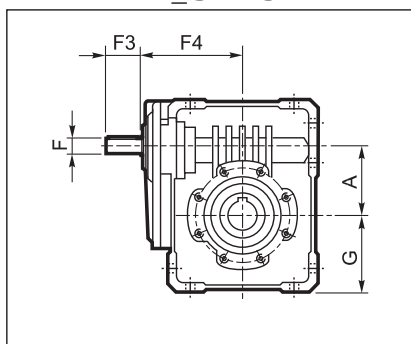
**VF\_FA/FC/FR/F..HS**



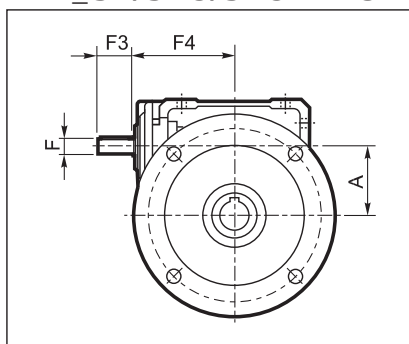
**VF\_U..HS**



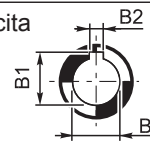
**W\_U..HS**



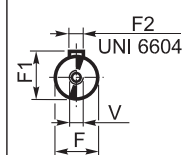
**W\_UF/UFC/UFCR..HS**



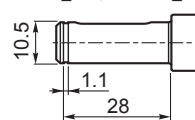
Albero uscita



Albero entrata

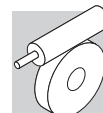


VF 44\_HS, VF 44\_U\_HS



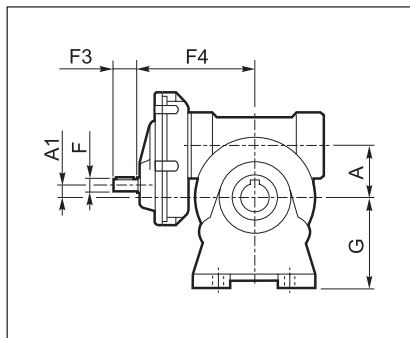
|            | A     | B         | B1         | B2    | F     | F1   | F2 | F3  | F4    | G    | V      | kg   |
|------------|-------|-----------|------------|-------|-------|------|----|-----|-------|------|--------|------|
| VF 30_HS   | 30    | 14 H7     | 16.3       | 5 H8  | 9 h6  | 10.2 | 3  | 20  | 50    | 55   | —      | 1.1  |
| VF 30_U_HS |       |           |            |       |       |      |    |     |       | 47   |        |      |
| VF 44_HS   | 44.6  | 18 H7     | 20.8       | 6 H8  | 11 h6 | 12.5 | 4  | 30  | 54    | 72   | —      | 2.0  |
| VF 44_U_HS |       |           |            |       |       |      |    |     |       | 55   |        |      |
| VF 49_HS   | 49.5  | 25 H7     | 28.3       | 8 H8  | 16 h6 | 18   | 5  | 40  | 65    | 82   | M6x16  | 3.0  |
| VF 49_U_HS |       |           |            |       |       |      |    |     |       | 64.5 |        |      |
| W 63_HS    | 62.17 | 25 H7     | 28.3       | 8 H8  | 18 h6 | 20.5 | 6  | 40  | 110.5 | 72.5 | M6x16  | 6.4  |
| W 75_HS    | 75    | 30(28) H7 | 33.3(31.3) | 8 H8  | 19 h6 | 21.5 | 6  | 40  | 128   | 87   | M6x16  | 10.0 |
| W 86_HS    | 86.9  | 35 H7     | 38.3       | 10 H8 | 25 h6 | 28   | 8  | 50  | 144   | 100  | M8x19  | 14.1 |
| W 110_HS   | 110.1 | 42 H7     | 45.3       | 12 H8 | 25 h6 | 28   | 8  | 60  | 168   | 125  | M8x19  | 27   |
| VF 130_HS  | 130   | 45 H7     | 48.8       | 14 H8 | 30 h6 | 33   | 8  | 60  | 160   | 195  | M8x20  | 49   |
| VF 150_HS  | 150   | 50 H7     | 53.8       | 14 H8 | 35 h6 | 38   | 10 | 65  | 185   | 220  | M8x20  | 60   |
| VF 185_HS  | 185.4 | 60 H7     | 64.4       | 18 H8 | 40 h6 | 43   | 12 | 70  | 214.5 | 254  | M8x20  | 94   |
| VF 210_HS  | 210   | 90 H7     | 95.4       | 25 H8 | 48 h6 | 51.5 | 14 | 110 | 230   | 335  | M16x40 | 175  |
| VF 250_HS  | 250   | 110 G7    | 116.4      | 28 H8 | 55 h6 | 59   | 16 | 110 | 275.5 | 380  | M16x40 | 275  |

Le dimensioni comuni alle altre configurazioni sono riportate da pag.112 a pag. 173.

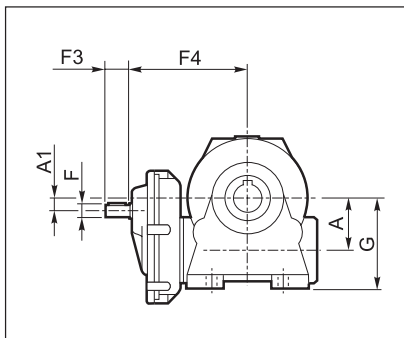


## VFR...HS - WR...HS

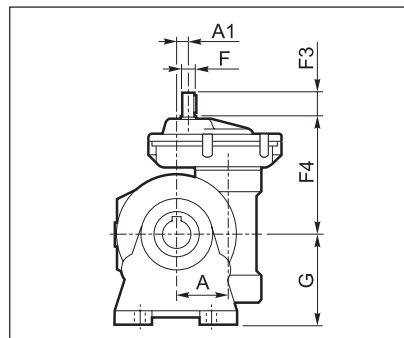
**VFR\_A..HS**



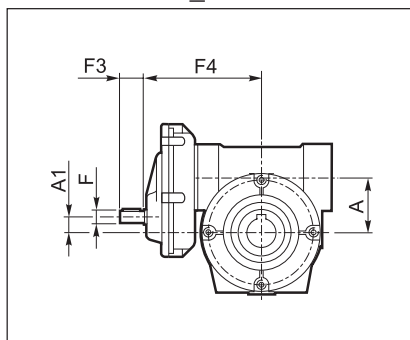
**VFR\_N..HS**



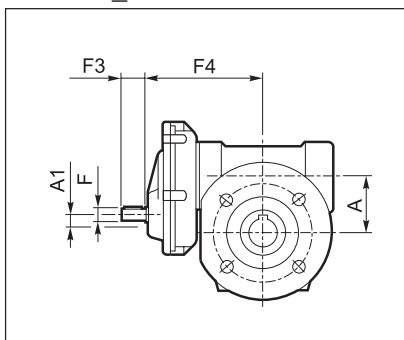
**VFR\_V..HS**



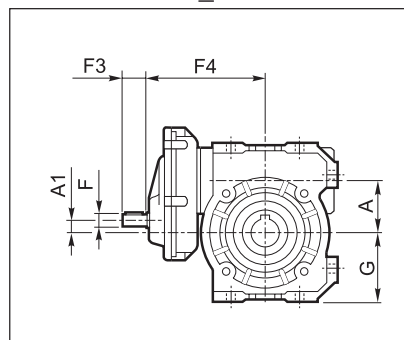
**VFR\_P..HS**



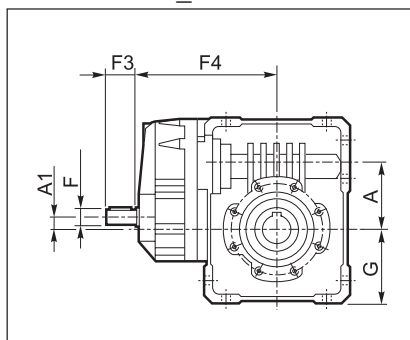
**VFR\_FA/FC/FR/F..HS**



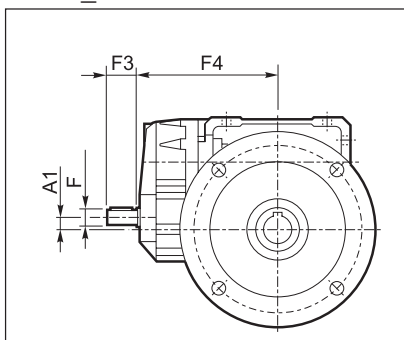
**VFR\_U..HS**



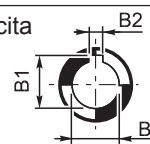
**WR\_U..HS**



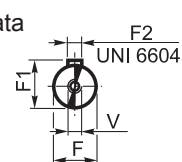
**WR\_UF/UFC/UFCR..HS**



Albero uscita

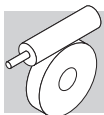


Albero entrata



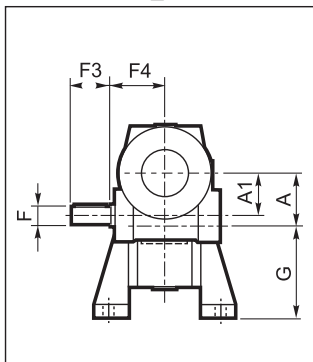
|             | A     | A1    | B         | B1         | B2    | F     | F1   | F2 | F3 | F4  | G    | V       |  |
|-------------|-------|-------|-----------|------------|-------|-------|------|----|----|-----|------|---------|---------------------------------------------------------------------------------------|
| VFR 49_HS   | 49.5  | 10    | 25 H7     | 28.3       | 8 H8  | 11 h6 | 12.5 | 4  | 23 | 110 | 82   | M4x10   | 5                                                                                     |
| VFR 49 U_HS |       |       |           |            |       |       |      |    |    |     | 64.5 |         |                                                                                       |
| WR 63_HS    | 62.17 | 11.42 | 25 H7     | 28.3       | 8 H8  | 14 h6 | 16   | 5  | 30 | 138 | 72.5 | M5x12.5 | 7.1                                                                                   |
| WR 75_HS    | 75    | 11    | 30(28) H7 | 33.3(31.3) | 8 H8  | 19 h6 | 21.5 | 6  | 40 | 162 | 87   | M6x16   | 11.1                                                                                  |
| WR 86_HS    | 86.9  | 22.9  | 35 H7     | 38.3       | 10 H8 | 19 h6 | 21.5 | 6  | 40 | 178 | 100  | M6x16   | 14.7                                                                                  |
| WR 110_HS   | 110.1 | 21.1  | 42 H7     | 45.3       | 12 H8 | 24 h6 | 27   | 8  | 50 | 201 | 125  | M8x19   | 34                                                                                    |
| VFR 130_HS  | 130   | 45    | 45 H7     | 48.8       | 14 H8 | 24 h6 | 27   | 8  | 50 | 228 | 195  | M8x20   | 57                                                                                    |
| VFR 150_HS  | 150   | 53    | 50 H7     | 53.8       | 14 H8 | 28 h6 | 31   | 8  | 60 | 280 | 220  | M8x20   | 71                                                                                    |
| VFR 185_HS  | 185.4 | 88.4  | 60 H7     | 64.4       | 18 H8 | 28 h6 | 31   | 8  | 60 | 310 | 254  | M8x20   | 110                                                                                   |
| VFR 210_HS  | 210   | 92    | 90 H7     | 95.4       | 25 H8 | 38 h6 | 41   | 10 | 80 | 335 | 335  | M10x25  | 185                                                                                   |
| VFR 250_HS  | 250   | 132   | 110 G7    | 116.4      | 28 H8 | 38 h6 | 41   | 10 | 80 | 383 | 380  | M10x25  | 295                                                                                   |

Le dimensioni comuni alle altre configurazioni sono riportate da pag.122 a pag. 175.

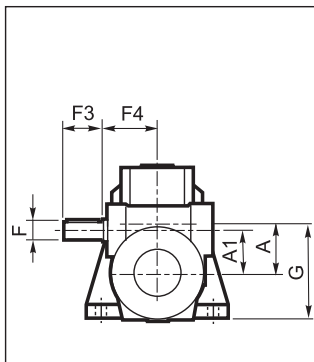


## VF/VF...HS - VF/W...HS - W/VF...HS

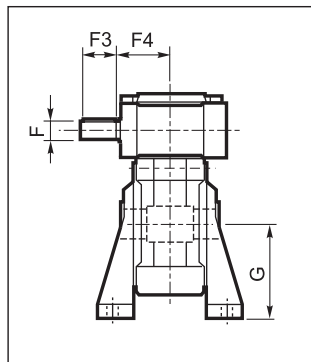
**VF/VF\_A..HS  
W/VF\_A..HS**



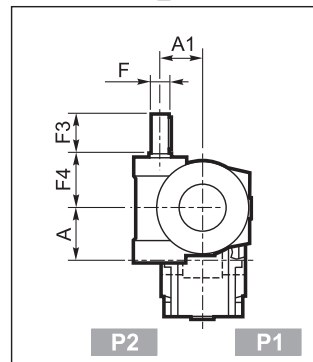
**VF/VF\_N..HS  
W/VF\_N..HS**



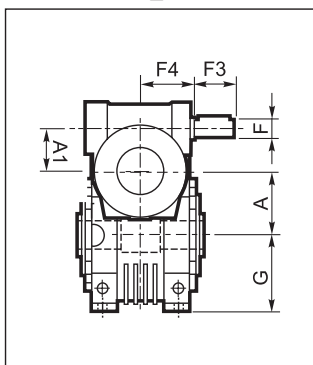
**VF/VF\_V..HS  
W/VF\_V..HS**



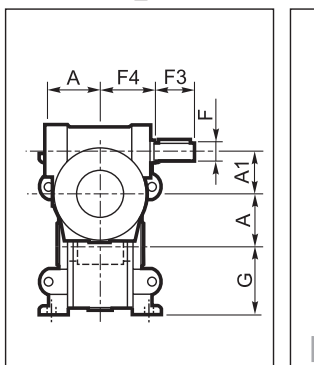
**VF/VF\_P..HS  
W/VF\_P..HS**



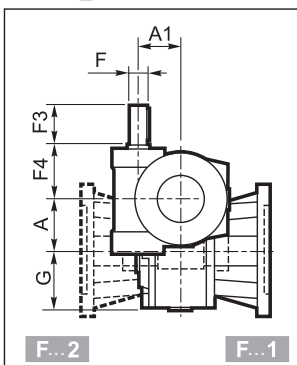
**VF/W\_U..HS**



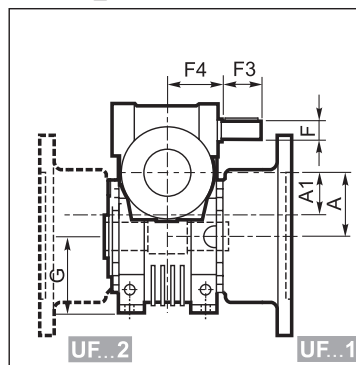
**VF/VF\_U..HS**



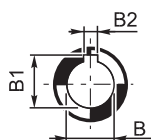
**VF/VF\_F/FA/FC/FR..HS  
W/VF\_F/FA/FC/FR..HS**



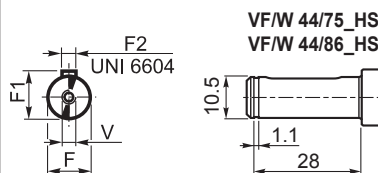
**VF/W\_UF/UFC/UFCR..HS**



Albero uscita

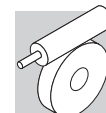


Albero entrata



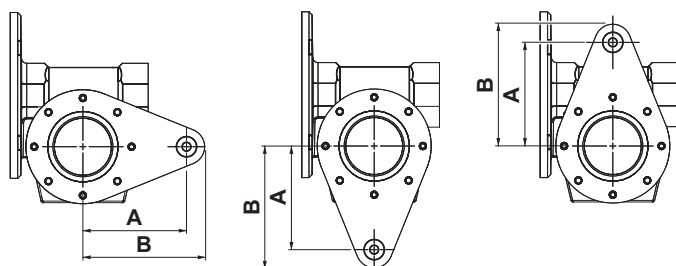
|                  | A     | A1    | B          | B1          | B2    | F     | F1   | F2 | F3 | F4    | G    | V     | kg   |
|------------------|-------|-------|------------|-------------|-------|-------|------|----|----|-------|------|-------|------|
| VF/VF 30/44_HS   | 44.6  | 30    | 18 H7      | 20.8        | 6 H8  | 9 h6  | 10.2 | 3  | 20 | 50    | 72   | —     | 3.5  |
| VF/VF 30/44 U_HS |       |       |            |             |       |       |      |    |    |       | 55   |       |      |
| VF/VF 30/49_HS   | 49.5  | 30    | 25 H7      | 28.3        | 8 H8  | 9 h6  | 10.2 | 3  | 20 | 50    | 82   | —     | 4.5  |
| VF/VF 30/49 U_HS |       |       |            |             |       |       |      |    |    |       | 64.5 |       |      |
| VF/W 30/63_HS    | 62.17 | 30    | 25 H7      | 28.3        | 8 H8  | 9 h6  | 10.2 | 3  | 20 | 50    | 100  | —     | 7.5  |
| VF/W 44/75_HS    | 75    | 44.6  | 30 (28) H7 | 33.3 (31.3) | 8 H8  | 11 h6 | 12.5 | 4  | 30 | 54    | 115  | —     | 16.1 |
| VF/W 44/86_HS    | 86.9  | 44.6  | 35 H7      | 38.3        | 10 H8 | 11 h6 | 12.5 | 4  | 30 | 54    | 142  | —     | 42   |
| VF/W 49/110_HS   | 110.0 | 49.5  | 42 H7      | 45.3        | 12 H8 | 16 h6 | 18   | 5  | 40 | 65    | 170  | M6x16 | 46   |
| W/VF 63/130_HS   | 130   | 62.17 | 45 H7      | 48.8        | 14 H8 | 18 h6 | 20.5 | 6  | 40 | 110.5 | 72.5 | M6x16 | 74   |
| W/VF 86/150_HS   | 150   | 86.9  | 50 H7      | 53.8        | 14 H8 | 25 h6 | 28   | 8  | 50 | 144   | 100  | M8x19 | 108  |
| W/VF 86/185_HS   | 185.4 | 86.9  | 60 H7      | 64.4        | 18 H8 | 25 h6 | 28   | 8  | 50 | 144   | 100  | M8x19 | 109  |
| VF/VF 130/210_HS | 210   | 130   | 90 H7      | 95.4        | 25 H8 | 30 h6 | 33   | 8  | 60 | 160   | 335  | M8    | 225  |
| VF/VF 130/250_HS | 250   | 130   | 110 G7     | 116.4       | 28 H8 | 30 h6 | 33   | 8  | 60 | 160   | 380  | M8    | 325  |

Le dimensioni comuni alle altre configurazioni sono riportate da pag.118 a pag. 176.

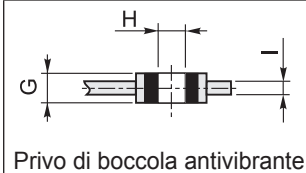


## 28 DIMENSIONI RIDUTTORI CON BRACCIO DI REAZIONE

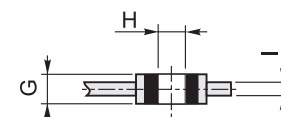
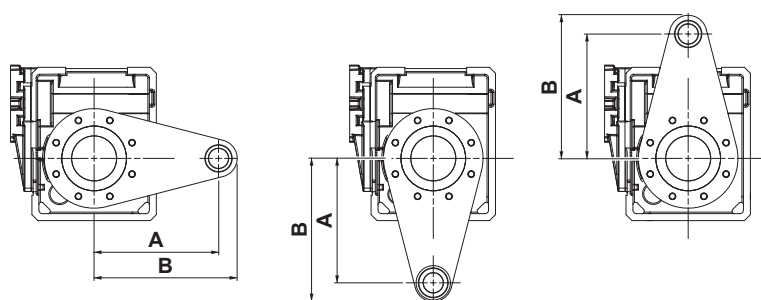
### VF - VFR - VF/VF - W/VF



#### VF 30 - VF 44 - VF 49



### W - WR - VF/W

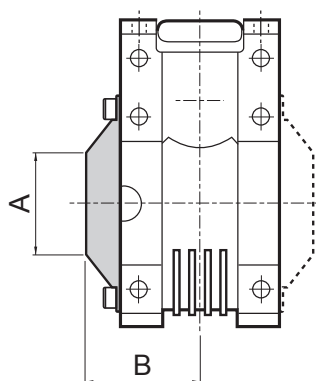


|       |     | A   | B     | G  | H  | I  |
|-------|-----|-----|-------|----|----|----|
| VF    | 30  | 100 | 117.5 | 14 | 8  | 4  |
| VFR   | 44  | 100 | 117.5 | 14 | 8  | 4  |
| VF/VF | 49  | 100 | 117.5 | 14 | 8  | 4  |
| W     | 63  | 150 | 178   | 20 | 10 | 6  |
| WR    | 75  | 200 | 237   | 25 | 20 | 6  |
| VF/W  | 86  | 200 | 238   | 25 | 20 | 6  |
|       | 110 | 250 | 288   | 25 | 20 | 6  |
|       | 130 | 300 | 345   | 30 | 25 | 6  |
| VF    | 150 | 300 | 345   | 30 | 25 | 6  |
| VFR   | 185 | 350 | 395   | 30 | 25 | 6  |
| W/VF  | 210 | 350 | 450   | 60 | 50 | 8  |
|       | 250 | 400 | 500   | 60 | 50 | 10 |

Le dimensioni comuni alle altre configurazioni sono riportate da pag.112 e pag. 176.

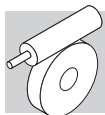
## 29 DIMENSIONI RIDUTTORI CON CAPPELOTTO DI PROTEZIONE

### W - WR - VF/W



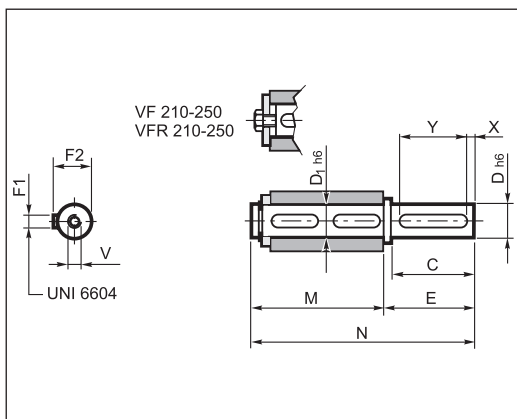
|      |     | A    | B    |
|------|-----|------|------|
|      | 63  | Ø 35 | 82   |
| W    | 75  | Ø 54 | 85.5 |
| WR   | 86  | Ø 71 | 93.5 |
| VF/W | 110 | Ø 89 | 103  |

Le dimensioni comuni alle altre configurazioni sono riportate da pag.126 e pag. 141.

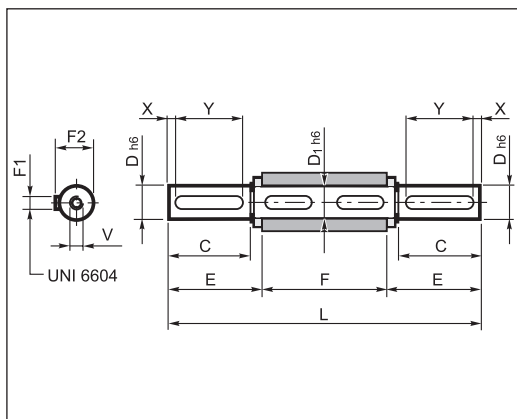


## 30 ACCESSORI

### 30.1 Albero lento riportato

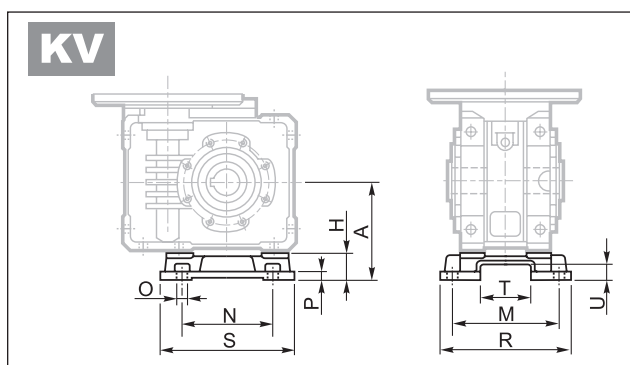
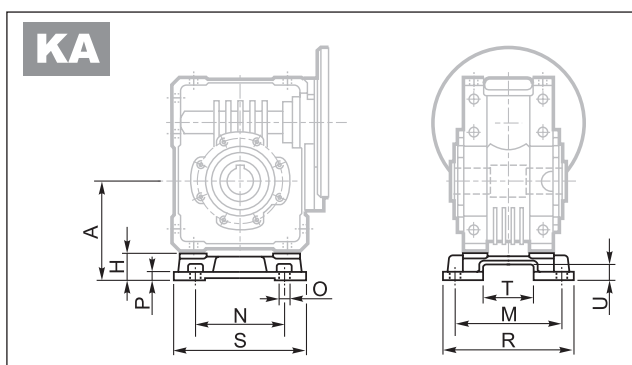


|       |        | C   | D   | D1  | E   | F1 | F2   | M   | N   | V      | X   | Y   |
|-------|--------|-----|-----|-----|-----|----|------|-----|-----|--------|-----|-----|
| VF    | 30     | 30  | 14  | 14  | 35  | 5  | 16   | 61  | 96  | M5x13  | 5   | 20  |
| VFR   | 44     | 40  | 18  | 18  | 45  | 6  | 20.5 | 70  | 115 | M6x16  | 5   | 30  |
| VF/VF | 49     | 60  | 25  | 25  | 65  | 8  | 28   | 89  | 154 | M8x19  | 5   | 50  |
|       | 63     | 60  | 25  | 25  | 65  | 8  | 28   | 127 | 192 | M8x19  | 5   | 50  |
| W     | 75_D28 | 60  | 28  | 30  | 65  | 8  | 31   | 134 | 199 | M8x20  | 5   | 50  |
| WR    | 75_D30 | 60  | 30  | 30  | 65  | 8  | 33   | 134 | 199 | M10x22 | 5   | 50  |
| VF/W  | 86     | 60  | 35  | 35  | 65  | 10 | 38   | 149 | 214 | M10x22 | 5   | 50  |
|       | 110    | 75  | 42  | 42  | 80  | 12 | 45   | 164 | 244 | M12x28 | 7.5 | 60  |
|       | 130    | 80  | 45  | 45  | 85  | 14 | 48.5 | 176 | 261 | M12x32 | 5   | 70  |
| VF    | 150    | 85  | 50  | 50  | 93  | 14 | 53.5 | 185 | 278 | M16x40 | 7.5 | 70  |
| VFR   | 185    | 100 | 60  | 60  | 110 | 18 | 64   | 200 | 310 | M16x40 | 10  | 80  |
| W/VF  | 210    | 130 | 90  | 90  | 140 | 25 | 95   | 255 | 395 | M20x50 | 5   | 120 |
|       | 250    | 165 | 110 | 110 | 175 | 28 | 116  | 315 | 490 | M24x64 | 15  | 140 |

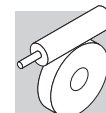


|       |        | C   | D   | D1  | E    | F   | F1 | F2   | L     | V      | X   | Y   |
|-------|--------|-----|-----|-----|------|-----|----|------|-------|--------|-----|-----|
| VF    | 30     | 30  | 14  | 14  | 32.5 | 55  | 5  | 16   | 120   | M5x13  | 5   | 20  |
| VFR   | 44     | 40  | 18  | 18  | 42.7 | 64  | 6  | 20.5 | 149.4 | M6x16  | 5   | 30  |
| VF/VF | 49     | 60  | 25  | 25  | 63.2 | 82  | 8  | 28   | 208.4 | M8x19  | 5   | 50  |
|       | 63     | 60  | 25  | 25  | 63.2 | 120 | 8  | 28   | 246.4 | M8x19  | 5   | 50  |
| W     | 75_D28 | 60  | 28  | 30  | 64   | 127 | 8  | 31   | 255   | M8x20  | 5   | 50  |
| WR    | 75_D30 | 60  | 30  | 30  | 64   | 127 | 8  | 33   | 255   | M10x22 | 5   | 50  |
| VF/W  | 86     | 60  | 35  | 35  | 64   | 140 | 10 | 38   | 268   | M10x22 | 5   | 50  |
|       | 110    | 75  | 42  | 42  | 79.3 | 155 | 12 | 45   | 313.5 | M12x28 | 7.5 | 60  |
|       | 130    | 80  | 45  | 45  | 84.7 | 165 | 14 | 48.5 | 334.5 | M12x32 | 5   | 70  |
| VF    | 150    | 85  | 50  | 50  | 90   | 175 | 14 | 53.5 | 355   | M16x40 | 7.5 | 70  |
| VFR   | 185    | 100 | 60  | 60  | 105  | 190 | 18 | 64   | 400   | M16x40 | 10  | 80  |
| W/VF  | 210    | 130 | 90  | 90  | 140  | 260 | 25 | 95   | 540   | M20x50 | 5   | 120 |
|       | 250    | 165 | 110 | 110 | 175  | 320 | 28 | 116  | 670   | M24x64 | 15  | 140 |

### 30.2 Kit piedi KA, KV



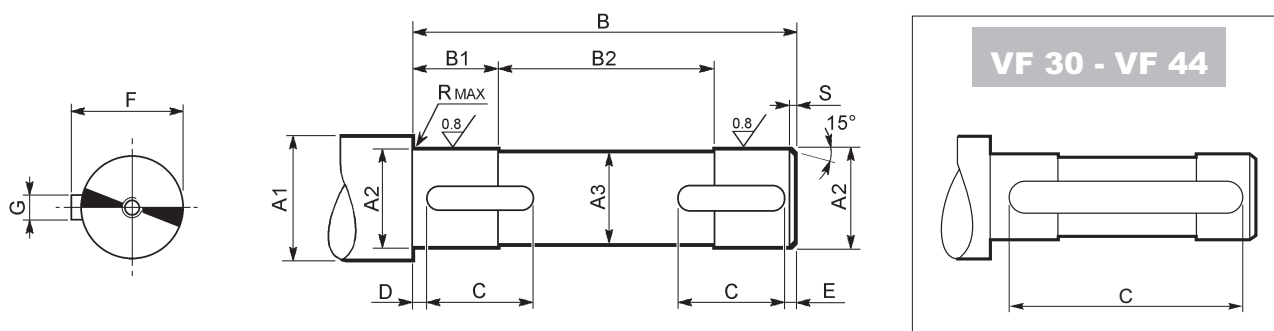
|                | A   | H    | M   | N   | O  | P  | R   | S   | T    | U    |
|----------------|-----|------|-----|-----|----|----|-----|-----|------|------|
| W 63 - WR 63   | 100 | 27.5 | 111 | 95  | 11 | 8  | 135 | 145 | 56.5 | 15.5 |
| W 75 - WR 75   | 115 | 28   | 115 | 120 | 11 | 9  | 139 | 174 | 56.5 | 15.5 |
| W 86 - WR 86   | 142 | 42   | 146 | 140 | 11 | 11 | 170 | 200 | 69   | 20   |
| W 110 - WR 110 | 170 | 45   | 181 | 200 | 13 | 14 | 210 | 250 | 69   | 20   |



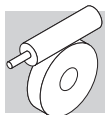
## 31 ALBERO CLIENTE

Realizzare l'albero condotto che si accoppierà con il riduttore con un acciaio di buona qualità, rispettando le dimensioni riportate in tabella.

Si suggerisce inoltre di completare il montaggio con un dispositivo di bloccaggio assiale dell'albero, ad esempio come illustrato nel seguito, avendo cura di verificare e dimensionare i vari componenti in funzione delle diverse esigenze applicative.



|               | A1    | A2     | A3  | B   | B1   | B2  | C  | D   | E   | F    | G     | R   | S   | <br>UNI 6604 |
|---------------|-------|--------|-----|-----|------|-----|----|-----|-----|------|-------|-----|-----|---------------------------------------------------------------------------------------------------|
| <b>VF 30</b>  | ≥ 19  | 14 f7  | 13  | 53  | 18.5 | 16  | 40 | 6.5 | 6.5 | 16   | 5 h9  | 0.5 | 1.5 | 5x5x40 A                                                                                          |
| <b>VF 44</b>  | ≥ 23  | 18 f7  | 17  | 62  | 22.5 | 17  | 50 | 6   | 6   | 20.5 | 6 h9  | 0.5 | 1.5 | 6x6x50 A                                                                                          |
| <b>VF 49</b>  | ≥ 30  | 25 f7  | 24  | 80  | 20.5 | 39  | 20 | 2   | 2   | 28   | 8 h9  | 1   | 1.5 | 8x7x20 A                                                                                          |
| <b>W 63</b>   | ≥ 30  | 25 f7  | 24  | 118 | 38   | 42  | 35 | 2   | 2   | 28   | 8 h9  | 1   | 1.5 | 8x7x35 A                                                                                          |
| <b>W 75</b>   | ≥ 35  | 28 f7  | 27  | 125 | 38   | 49  | 40 | 2   | 2   | 31   | 8 h9  | 1   | 1.5 | 8x7x40 A                                                                                          |
|               | ≥ 35  | 30 f7  | 29  | 125 | 38   | 49  | 40 | 2   | 2   | 33   | 8 h9  | 1   | 1.5 | 8x7x40 A                                                                                          |
| <b>W 86</b>   | ≥ 42  | 35 f7  | 34  | 138 | 43   | 52  | 40 | 2   | 2   | 38   | 10 h9 | 1.5 | 1.5 | 10x8x40 A                                                                                         |
| <b>W 110</b>  | ≥ 48  | 42 f7  | 41  | 153 | 43   | 67  | 50 | 2   | 2   | 45   | 12 h9 | 1.5 | 2   | 12x8x50 A                                                                                         |
| <b>VF 130</b> | ≥ 52  | 45 f7  | 44  | 163 | 50.5 | 62  | 60 | 2.5 | 2.5 | 48.5 | 14 h9 | 2.5 | 2   | 14x9x60 A                                                                                         |
| <b>VF 150</b> | ≥ 57  | 50 f7  | 49  | 173 | 53   | 67  | 70 | 2.5 | 2.5 | 53.5 | 14 h9 | 2.5 | 2   | 14x9x70 A                                                                                         |
| <b>VF 185</b> | ≥ 68  | 60 f7  | 59  | 188 | 63   | 62  | 80 | 2.5 | 2.5 | 64   | 18 h9 | 2.5 | 2   | 18x11x80 A                                                                                        |
| <b>VF 210</b> | ≥ 99  | 90 f7  | 89  | 258 | 83   | 92  | 80 | 3   | 3   | 95   | 25 h9 | 2.5 | 2.5 | 25x14x80 A                                                                                        |
| <b>VF 250</b> | ≥ 121 | 110 h7 | 109 | 318 | 83   | 152 | 80 | 3   | 3   | 116  | 28 h9 | 2.5 | 2.5 | 28x16x80 A                                                                                        |



## 32 LIMITATORE DI COPPIA

### 32.1 Descrizione

Il limitatore di coppia a frizione è studiato e realizzato per i riduttori senza fine **VF44 - VF49** e **W63... W110**, è un dispositivo di protezione atto a salvaguardare la trasmissione da sovraccarichi accidentali che potrebbero danneggiare tutti gli elementi della trasmissione creando seri inconvenienti alla macchina operatrice.

Rispetto ai tradizionali limitatori di coppia montati esternamente al riduttore questa versatile soluzione presenta i seguenti vantaggi:

- nessun ingombro aggiuntivo esterno ai riduttori forniti in versione standard
- lavorando a completo bagno d'olio non richiede nessuna manutenzione
- La coppia di slittamento può essere facilmente regolata tramite una semplice operazione manuale dall'esterno del riduttore
- lo slittamento, anche continuo, non crea danneggiamenti alla meccanica o consumi anormali, in quanto le superfici di slittamento sono separate da un costante velo d'olio.



**Se ne sconsiglia l'utilizzo in meccanismi di sollevamento.**

### 32.2 Modo di funzionamento

Il limitatore di coppia funziona come una frizione biconica con le sedi ricavate direttamente sulla corona in bronzo e sul mozzo in ghisa sferoidale GS400/12 monolitica avente l'albero lento cavo passante, il quale permette di collegare la macchina operatrice direttamente al nostro riduttore.

Le sedi coniche sono strette fra loro per effetto di una forza assiale costante generata da molle a tazza.

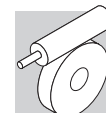
La registrazione della coppia di slittamento si effettua in modo semplice tramite la rotazione di una ghiera esterna al riduttore.

### 32.3 Protezione dell'impianto da sovraccarichi

Il limitatore opportunamente tarato alla coppia necessaria alla macchina operatrice, salvaguarda tutti gli organi meccanici del cinematismo evitando danneggiamenti dovuti a eventuali e ripetuti sovraccarichi.

### 32.4 Disinserimento in condizioni di irreversibilità

In determinate applicazioni può essere utile ruotare, a macchina ferma, l'albero lento del riduttore. Questa situazione non è sempre possibile nei riduttori a vite senza fine tradizionali. Tramite questo dispositivo, allentando opportunamente la ghiera di registrazione, possiamo eseguire agevolmente questa operazione.



## 32.5 VF...L, W...L

| L1           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|--------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|              | N                                                                                 | A                                                                                 | V                                                                                 | U                                                                                 | F1<br>FC1<br>FR1<br>FA1                                                           | F2<br>FC2<br>FR2<br>FA2**                                                         | P1<br>P2                                                                          |
| VF<br>VF/VF* |  |  |  |  |  |  |  |
|              | U                                                                                 | UF1<br>UFC1                                                                       | UF2<br>UFC2                                                                       | UFCR1                                                                             | UFCR2                                                                             |                                                                                   |                                                                                   |
| W<br>VF/W*   |  |  |  |  |  |  |  |

\*\* ⇨ VF 49

| L2           |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|--------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|              | N                                                                                 | A                                                                                  | V                                                                                   | U                                                                                   | F1<br>FC1<br>FR1<br>FA1**                                                           | F2<br>FC2<br>FR2<br>FA2                                                             | P1<br>P2                                                                            |
| VF<br>VF/VF* |  |  |  |  |  |  |  |
|              | U                                                                                 | UF1<br>UFC1                                                                        | UF2<br>UFC2                                                                         | UFCR1                                                                               | UFCR2                                                                               |                                                                                     |                                                                                     |
| W<br>VF/W*   |  |  |  |  |  |  |  |

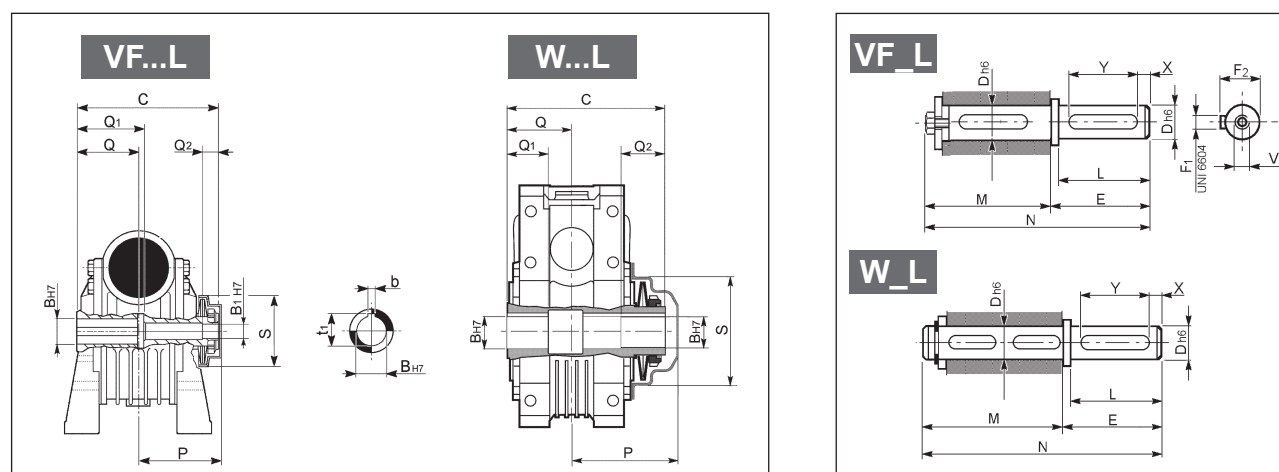
\*\* ⇨ VF 49

\* Nei riduttori combinati, il limitatore di coppia è installato sul 2° riduttore nelle esecuzioni L1 ed L2; è installato sul 1° riduttore nell'esecuzione LF.

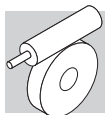
| LF |      |        |        |        |
|----|------|--------|--------|--------|
|    | VF/W | 44/75  | 44/86  | 49/110 |
|    | W/VF | 63/130 | 86/150 | 86/185 |

Se non preventivamente specificato, i riduttori VF...L verranno forniti con la ghiera a sinistra (L1) guardando il motore elettrico in posizione di montaggio B3.

## 32.6 Dimensioni



|           | Limitatore di coppia |      |    |    |      |      |                 |                  |                |    | Albero lento semplice |                 |    |    |      |       |       |        |     |    |
|-----------|----------------------|------|----|----|------|------|-----------------|------------------|----------------|----|-----------------------|-----------------|----|----|------|-------|-------|--------|-----|----|
|           | C                    | Q    | Q1 | Q2 | P    | S    | B <sub>H7</sub> | B <sub>1H7</sub> | t <sub>1</sub> | b  | L                     | D <sub>h6</sub> | E  | F1 | F2   | M     | N     | V      | X   | Y  |
| VF 44L    | 79                   | 32   | 32 | 12 | 48   | 42.5 | 18              | 11               | 20.8           | 6  | 40                    | 18              | 45 | 6  | 20.5 | 86    | 131   | M6x16  | 5   | 30 |
| VF 49L    | 105                  | 41   | 51 | 15 | 63.5 | 66.5 | 25              | 14               | 28.3           | 8  | 60                    | 25              | 65 | 8  | 28   | 114.5 | 179.5 | M8x19  | 5   | 40 |
| W 63L     | 145                  | 60   | 40 | 40 | 100  | 77   | 25              | -                | 28.3           | 8  | 60                    | 25              | 65 | 8  | 28   | 152   | 217   | M8x19  | 5   | 50 |
| W 75L_D30 | 154.5                | 63.5 | 40 | 40 | 104  | 100  | 30              | -                | 33.3           | 8  | 60                    | 30              | 65 | 8  | 33   | 161.5 | 226.5 | M10x22 | 5   | 50 |
| W 86L     | 170                  | 70   | 50 | 45 | 113  | 119  | 35              | -                | 38.3           | 10 | 60                    | 35              | 65 | 10 | 38   | 179   | 244   | M10x22 | 5   | 50 |
| W 110L    | 191                  | 77.5 | 55 | 45 | 133  | 134  | 42              | -                | 45.3           | 12 | 75                    | 42              | 80 | 12 | 45   | 200   | 280   | M12x28 | 7.5 | 60 |



### 32.7 Registrazione coppia di slittamento

In fabbrica viene eseguita una pretaratura dello slittamento su un momento torcente coincidente col valore di coppia nominale  $Mn_2$  [ $n_1=1400$ ] del riduttore tipo VF o W.

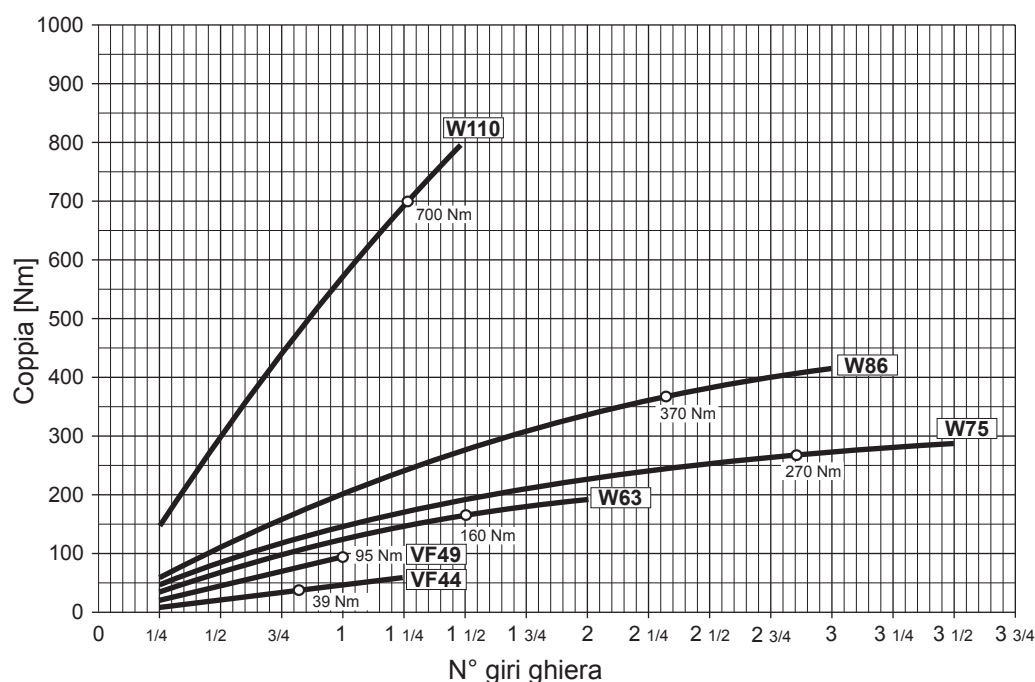
Qui di seguito sono descritte le operazioni eseguite in fabbrica per realizzare la taratura della coppia di slittamento. Le stesse operazioni, a meno del passo (2), dovranno essere ripercorse quando si vuole impostare un valore di coppia diverso dall'originale.

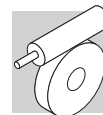
1. La ghiera di registrazione viene avvitata fino a che le molle a tazza non sono sufficientemente caricate da non potere ruotare liberamente, se azionate manualmente.

2. Per mezzo di un bulino vengono incise, in identica posizione angolare, due marcature di riferimento, sia sulla ghiera che sulla sporgenza d'albero lento.

Questa posizione di riferimento costituirà il punto iniziale per il conteggio dei successivi giri della ghiera e la conseguente taratura di coppia.

3. Infine la ghiera viene avvitata delle frazioni di giro corrispondenti al valore di coppia nominale  $Mn_2$  del riduttore in oggetto. Il riferimento in questo caso è il diagramma sotto riportato, il quale sarà d'utilità anche per le eventuali nuove impostazioni che si dovessero rendere necessarie nel tempo.





## VF-EP / W-EP - RIDUTTORI E MOTORIDUTTORI PER AMBIENTI CORROSIVI E ASETTICI

### 33 I VANTAGGI DELL'ESECUZIONE EP PER L'INDUSTRIA

Le compagnie dei settori alimentare, chimico o farmaceutico hanno oggi a disposizione una nuova gamma di motoriduttori appositamente studiati per operare in maniera efficace in ambienti caratterizzati da elevati standard igienici e agenti ostili che sono tipici di questa tipologia di industrie.

**Ideali per le industrie di processo alimentare**

**Resistenti alla corrosione**

**Servizio idoneo per gli ambienti più ostili**

**Lavabili/sanificabili con i detergenti più comunemente utilizzati**

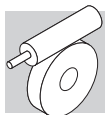
### CARATTERISTICHE PRINCIPALI

#### Standard:

- Albero cavo, targhette e viteria in acciaio inossidabile
- Riduttore completamente sigillato
- Chiusura dei fori filettati non utilizzati mediante tappi a pressione
- Fori per il drenaggio dell'acqua
- Protezione del motore IP56
- Protezione contro la corrosione in classe C5 oppure verniciature alimentari approvate da FDA & NSF

#### Opzioni Principali:

- Anelli di tenuta per lavaggi con getti d'acqua in pressione
- Lubrificante compatibile con gli alimenti omologato da NSF (H1) e FDA



## PRINCIPALI VANTAGGI DELL'ESECUZIONE EP

Grazie alla completa ermeticità del riduttore ed alle verniciature e protezioni superficiali dedicate, i motoriduttori della serie EP assicurano un funzionamento affidabile e privo di rischi in ambienti sia corrosivi che igienici, facilitando inoltre al cliente la sanitizzazione del motoriduttore.

L'intero motoriduttore è infatti protetto da un sistema epossidico multistrato con elevate proprietà di tenuta, che garantisce alta resistenza a corrosione ed abrasione.

Due differenti sistemi di finitura possono essere selezionati:

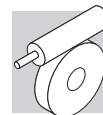
- Il primo garantisce una resistenza alla corrosione di classe C5 in accordo alla norma ISO 9223 ed è disponibile come standard in RAL9006.
- Il secondo è dedicato alle industrie alimentari ed è registrato da NSF e FDA come compatibile per l'utilizzo in aree dove è possibile il contatto accidentale con cibo o con acqua potabile. Inoltre, oltre a garantire una comunque elevata resistenza alla corrosione, questa finitura è anche lavabile con la maggior parte dei detergenti comunemente utilizzati nelle industrie alimentari.

**NOTA:** Questa finitura è automaticamente selezionata quando il colore specificato per il motoriduttore è Light Blue\*(PLB) o White\*(PWH).

\*Nota: Non è possibile specificare un RAL in quanto la vernice è a base organica.

Infine, i motoriduttori della serie EP possono essere ulteriormente adattati a specifiche richieste attraverso varie opzioni e accessori.

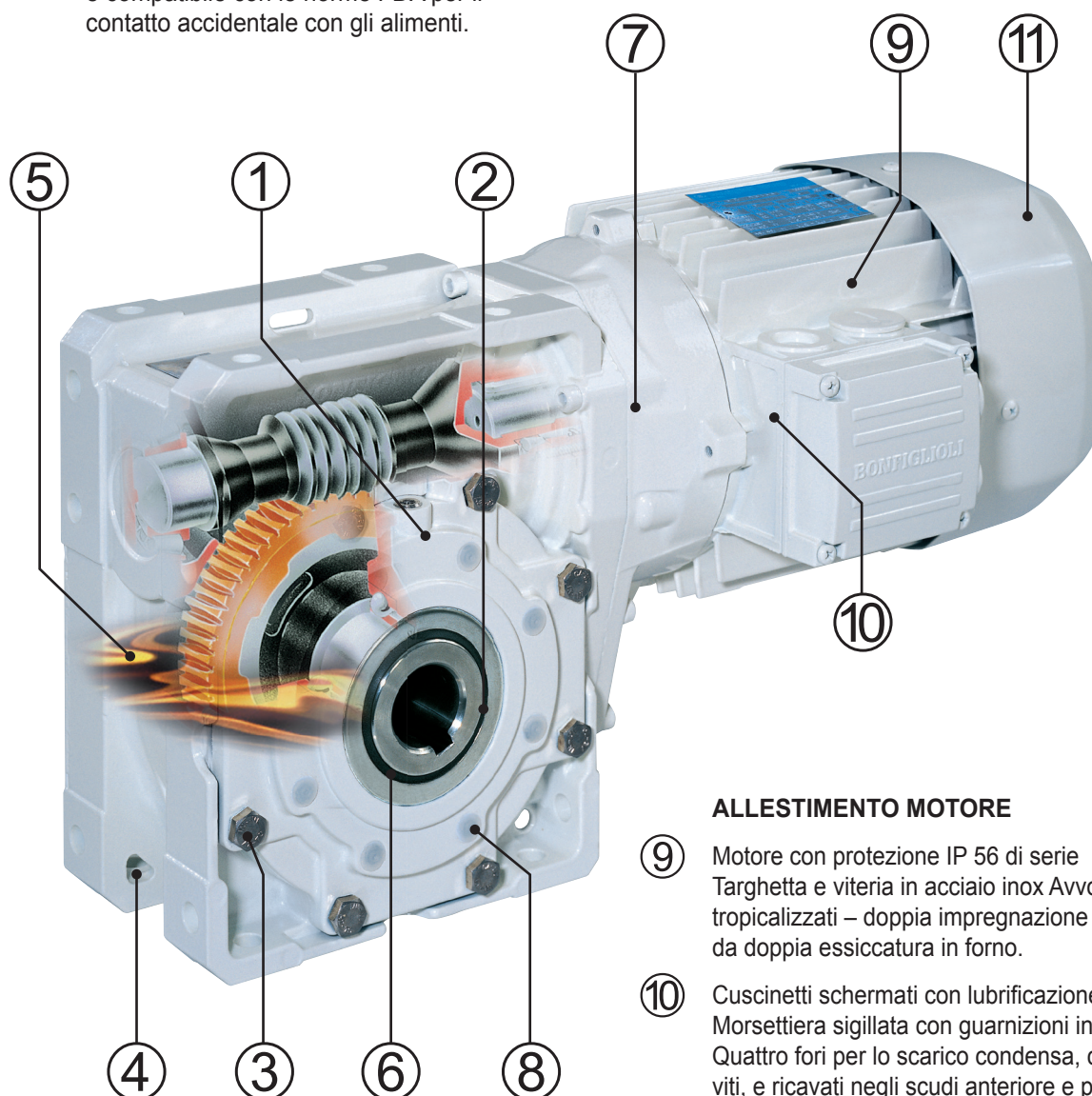
Grandezze di riduttore disponibili in versione EP: VF44 (Escluso VFR), VF49, W63, W75, W86.  
Motorizzazioni disponibili: da 0.12 a 4.0kW in esecuzione sia compatta che IEC in 2, 4 e 6 poli.



### ALLESTIMENTO RIDUTTORE

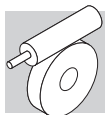
- ① Il riduttore è completamente sigillato allo scopo di minimizzare ogni possibile contaminazione dell'ambiente esterno.
- ② Albero lento cavo in acciaio inossidabile AISI 316.
- ③ Targhetta e viteria in acciaio inossidabile.
- ④ Cassa progettata per drenaggio acqua, per evitarne il ristagno dopo il lavaggio.
- ⑤ È disponibile in opzione olio sintetico omologato da NSF quale lubrificante H1 per l'uso nell'industria alimentare e farmaceutica e compatibile con le norme FDA per il contatto accidentale con gli alimenti.

- ⑥ Disponibili tenute in PTFE con schermo in inox, resistenti ai lavaggi in pressione.
- ⑦ Trattamento epossidico delle superfici esterne, approvato FDA e NSF (in funzione della tinta scelta) per il contatto accidentale con gli alimenti e altamente resistente alla corrosione.
- ⑧ Chiusura dei fori filettati non utilizzati mediante tappi a pressione.



### ALLESTIMENTO MOTORE

- ⑨ Motore con protezione IP 56 di serie Targhetta e viteria in acciaio inox Avvolgimenti tropicalizzati – doppia impregnazione seguita da doppia essiccazione in forno.
- ⑩ Cuscinetti schermati con lubrificazione “a vita”. Morsettiera sigillata con guarnizioni in NBR. Quattro fori per lo scarico condensa, chiusi con viti, e ricavati negli scudi anteriore e posteriore. Giunti di accoppiamento scudi-cassa sigillati.
- ⑪ Ventola di raffreddamento in materiale poliammidico, compatibile con gli alimenti.



### RIDUTTORE

**W-EP — 63 U 30 P90 B14 B3 PWH ....**

OPZIONI

#### VERNICE

**NP\*** vernice assente

**PWH**

(conforme a  
FDA e NSF)

**PLB**

(conforme a  
FDA e NSF)

**RAL9006**

(alta resistenza  
alla corrosione C5)

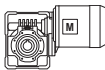
#### POSIZIONE DI MONTAGGIO

|                               |                                         |
|-------------------------------|-----------------------------------------|
| VF-EP 44<br>VF-EP 49          | <b>B3</b>                               |
| W-EP 63<br>W-EP 75<br>W-EP 86 | <b>B3 (default), B6, B7, B8, V5, V6</b> |

#### FORMA COSTRUTTIVA MOTORE

**B5, B14** (IEC standard)

#### DESIGNAZIONE INGRESSO

|               | VF-EP                                                                                            | VF-EP R                                                                                    | W-EP                                                                                                | W-EP R                                                                                             |
|---------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>P(IEC)</b> | <br>P63...P80 | <br>P63 | <br>P71...P112 | <br>P63...P90 |
| <b>S_</b>     |               |         | <br>S1...S3    |               |

#### RAPPORTO DI RIDUZIONE

#### FORMA COSTRUTTIVA

#### GRANDEZZA RIDUTTORE

VF-EP: **44, 49**

W-EP: **63, 75, 86**

— (blank)

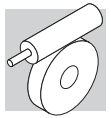
**R** (precoppia elicoidale  VF-EP 44)

#### TIPO RIDUTTORE

**VF-EP**

**W-EP**

\*Nota: Nel caso in cui il riduttore sia richiesto in versione NP (Non Verniciato) e con braccio di reazione, quest'ultimo viene fornito con applicato un primer di colore grigio chiaro completamente sovraverniciabile.



## MOTORE

**BN-EP 80B 4 B14 230/400-50 CLF .... PWH ....**

OPZIONI

## VERNICE

**NP\*** vernice assente**PWH**(conforme a  
FDA e NSF)**PLB**(conforme a  
FDA e NSF)**RAL9006**(alta resistenza  
alla corrosione C5)

POSIZIONE MORSETTIERA  
**W** (default), **N**, **E**, **S**

CLASSE ISOLAMENTO  
**CL F** standard  
**CL H** option

TENSIONE - FREQUENZA

## FORMA COSTRUTTIVA

**—** (motore integrato)**B5, B14** (motore IEC)

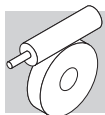
NUMERO DI POLI  
**2, 4, 6,**

## GRANDEZZA MOTORE

**1SC ... 3LC** (motore integrato)**63 ... 112** (motore IEC)

## TIPO MOTORE

**M-EP** = trifase integrato**BN-EP** = trifase IEC



## 35 OPZIONI RIDUTTORE

### PX

Opzione Anelli di tenuta albero lento. Gli speciali anelli di tenuta offerti in opzione estendono l'applicabilità dei riduttori ai processi in cui sono frequenti i lavaggi con getti d'acqua in pressione.

Lo schermo esterno in acciaio INOX e la realizzazione a doppio labbro infatti aggiungono alla funzionalità di base anche la resistenza alla pressione esterna, mentre il particolare materiale utilizzato (PTFE) garantisce eccezionale resistenza agli elementi chimici aggressivi, basso coefficiente d'attrito e lunga durata.

### PV

Anelli di tenuta in fluoro-elastomero su albero lento. Molla interna in acciaio inox.

### UH1

Opzione Olio compatibile con gli alimenti. Il riduttore viene riempito in fabbrica con lubrificante "long life" rispondente ai requisiti delle Normative più diffuse e in particolare è omologato da NSF quale lubrificante H1 per l'uso nell'industria alimentare e farmaceutica, inoltre soddisfa le norme FDA 21 CFR Sec. 178.3570.

La sua natura sintetica a base di poliglicoli, oltre ad estenderne l'uso ad un ampio campo di temperature (-25° C sino a +150° C), non rende necessarie sostituzioni periodiche e pertanto, in assenza di contaminanti, il lubrificante potrà considerarsi "a vita".

## PROVE DOCUMENTALI

### AC - Attestato di conformità

Documento il cui rilascio attesta la conformità del prodotto all'ordinativo e la costruzione dello stesso in conformità alle procedure standard di processo e di controllo previste dal sistema di Qualità Bonfiglioli Riduttori.

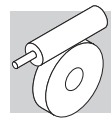
### CC - Certificato di collaudo

La specifica comporta la conduzione di verifiche di conformità all'ordine, controlli visivi generali e verifiche strumentali delle dimensioni di accoppiamento. Sono inoltre condotti controlli generali di funzionamento a vuoto e verifiche della funzionalità delle guarnizioni di tenuta in modalità statica e in funzionamento. Il collaudo si applica ad un campione statistico del lotto di spedizione.

## 36 OPZIONI MOTORI

Le opzioni disponibili per tutti i motori EP sono: D3, E3, K1, H1, NH1, RC, RV, ACM, CC, CUS, S2, S3, S9.

Per informazioni sulle opzioni, consultare i relativi capitoli nella sezione Motori Elettrici.



### 37 ALTRE INFORMAZIONI SUI RIDUTTORI E I MOTORIDUTTORI

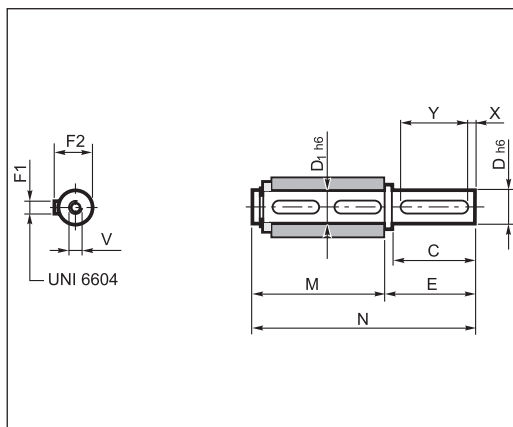
Le posizioni di montaggio, i dati tecnici, le predisposizioni motore, i momenti d'inerzia e le dimensioni dei riduttori **VF-EP** e **W-EP** non cambiano rispetto all'equivalente prodotto delle serie **VF** e **W**. Allo stesso modo le informazioni relative a tutti i motori **EP** non cambiano rispetto agli equivalenti motori di serie. Tutte queste informazioni possono essere reperite nei relativi capitoli di questo catalogo.

### 38 GLI ACCESSORI DELLA SERIE EP

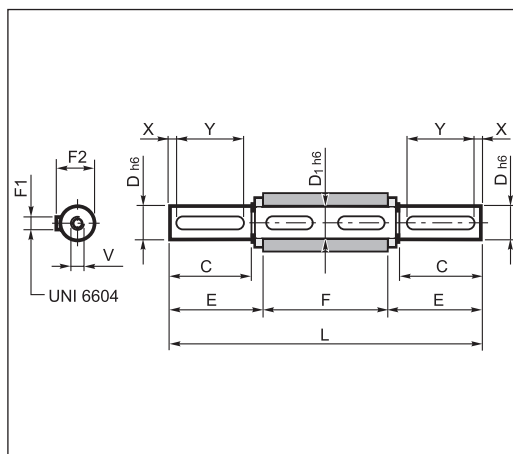
A seconda delle necessità applicative potranno essere richiesti determinati accessori che completano l'architettura del prodotto, e in particolare:

- albero lento, sia semplice che bilaterale, in acciaio INOX tipo 316, completo di chiavette in identico materiale
- braccio di reazione in lamiera verniciata (specificare la sigla tra quelle riportate nella relativa figura)
- coperchio di sicurezza per la zona albero lento (cavo) in plastica (W63, W75 e W86) o lamiera rivestita in gomma NBR (VF 44, VF 49) con viteria in acciaio INOX e grado di protezione complessivo IP56.

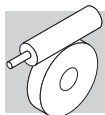
#### 38.1 Albero lento riportato



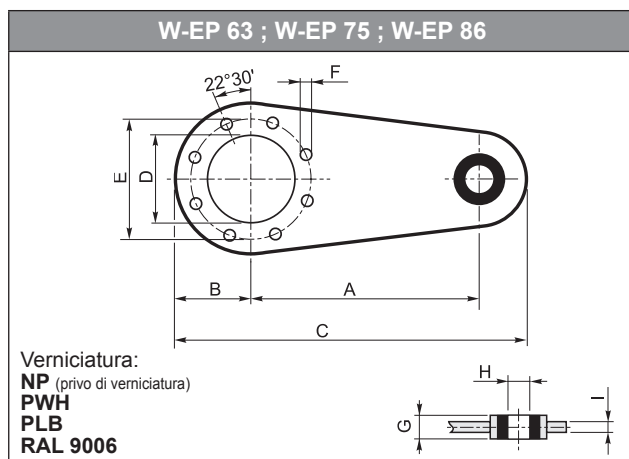
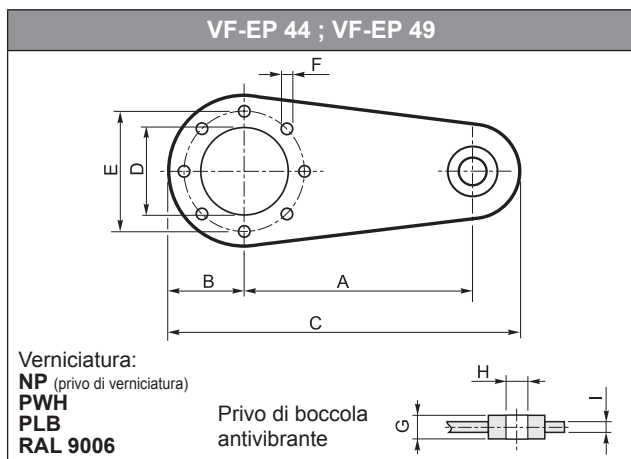
|                                      | C  | D  | D1 | E  | F1 | F2   | M   | N   | V      | X | Y  |
|--------------------------------------|----|----|----|----|----|------|-----|-----|--------|---|----|
| <b>VF-EP 44</b>                      | 40 | 18 | 18 | 45 | 6  | 20.5 | 70  | 115 | M6x16  | 5 | 30 |
| <b>VF-EP 49</b><br><b>VF-EP R 49</b> | 60 | 25 | 25 | 65 | 8  | 28   | 89  | 154 | M8x19  | 5 | 50 |
| <b>W-EP 63</b><br><b>W-EP R 63</b>   | 60 | 25 | 25 | 65 | 8  | 28   | 127 | 192 | M8x19  | 5 | 50 |
| <b>W-EP 75</b><br><b>W-EP R 75</b>   | 60 | 30 | 30 | 65 | 8  | 33   | 134 | 199 | M10x22 | 5 | 50 |
| <b>W-EP 86</b><br><b>W-EP R 86</b>   | 60 | 35 | 35 | 65 | 10 | 38   | 149 | 214 | M10x22 | 5 | 50 |



|                                      | C  | D  | D1 | E    | F   | F1 | F2   | L     | V      | X | Y  |
|--------------------------------------|----|----|----|------|-----|----|------|-------|--------|---|----|
| <b>VF-EP 44</b>                      | 40 | 18 | 18 | 42.7 | 64  | 6  | 20.5 | 149.4 | M6x16  | 5 | 30 |
| <b>VF-EP 49</b><br><b>VF-EP R 49</b> | 60 | 25 | 25 | 63.2 | 82  | 8  | 28   | 208.4 | M8x19  | 5 | 50 |
| <b>W-EP 63</b><br><b>W-EP R 63</b>   | 60 | 25 | 25 | 63.2 | 120 | 8  | 28   | 246.4 | M8x19  | 5 | 50 |
| <b>W-EP 75</b><br><b>W-EP R 75</b>   | 60 | 30 | 30 | 64   | 127 | 8  | 33   | 255   | M10x22 | 5 | 50 |
| <b>W-EP 86</b><br><b>W-EP R 86</b>   | 60 | 35 | 35 | 64   | 140 | 10 | 38   | 268   | M10x22 | 5 | 50 |

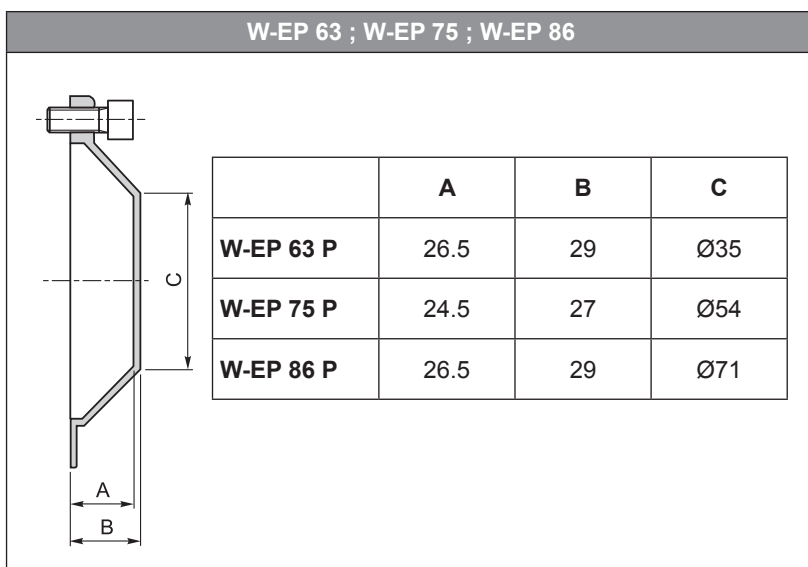
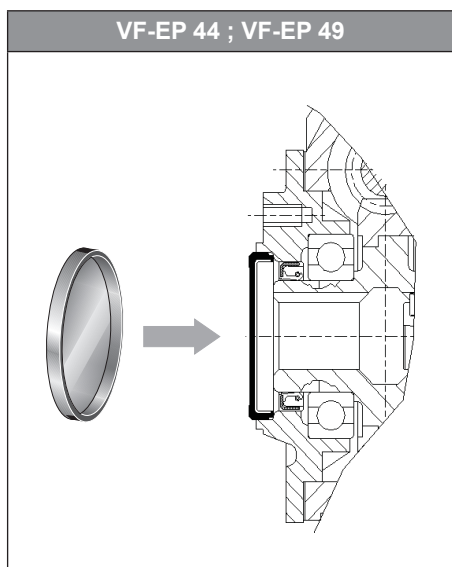


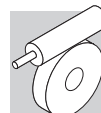
## 38.2 Braccio di reazione



|                                      | A   | B  | C     | D   | E   | F  | G  | H  | I |
|--------------------------------------|-----|----|-------|-----|-----|----|----|----|---|
| <b>VF-EP 44</b>                      | 100 | 40 | 157.5 | 50  | 65  | 7  | 14 | 8  | 4 |
| <b>VF-EP 49</b><br><b>VF-EP R 49</b> | 100 | 55 | 172.5 | 68  | 94  | 7  | 14 | 8  | 4 |
| <b>W-EP 63</b><br><b>W-EP R 63</b>   | 150 | 55 | 233   | 75  | 90  | 9  | 20 | 10 | 6 |
| <b>W-EP 75</b><br><b>W-EP R 75</b>   | 200 | 63 | 300   | 90  | 110 | 9  | 25 | 20 | 6 |
| <b>W-EP 86</b><br><b>W-EP R 86</b>   | 200 | 80 | 318   | 110 | 130 | 11 | 25 | 20 | 6 |

## 38.3 Cappellotto di protezione





## DISPOSITIVO FINE-CORSA RVS

### 39 INFORMAZIONI GENERALI

Il dispositivo fine-corsa, tipo RVS, è progettato per completare ed adattare i motoriduttori a vite senza fine di Bonfiglioli Riduttori all'azionamento di:

- finestre e ombreggi per serre
- cancelli automatici
- finestre a vasistas
- dosatori per granaglie nel settore zootecnico
- valvole a farfalla

I motoriduttori dotati del dispositivo **RVS** sono anche idonei per qualsiasi altra applicazione intermittente, in cui si richieda un moto controllato e preciso.

Per le applicazioni sopra descritte, caratterizzate da un tipo di servizio leggero e intermittente, si raccomanda di effettuare la selezione del gruppo di trasmissione unicamente dalle pagine del paragrafo 40. Le selezioni così effettuate saranno conformi al particolare tipo di servizio e alle massime velocità compatibili con il regolare funzionamento del dispositivo fine-corsa.

**La configurazione completa si ottiene assemblando il dispositivo fine-corsa sul relativo motoriduttore, mediante lo specifico kit di montaggio (disponibile per i gruppi tipo VF 49, W63, W75 e W86), illustrato alla pagina seguente.**

Per consentire il montaggio del dispositivo **RVS**, i motoriduttori devono essere nella forma costruttiva flangiata.

#### 39.1 Caratteristiche tecniche

Il funzionamento del dispositivo fine-corsa si basa sul movimento differenziale di due coppie di ruote, dotate di camma, e dal relativo azionamento di microinterruttori di precisione che attraverso relais (a cura dell'installatore) comandano l'arresto e l'inversione del moto.

Le posizioni estreme del moto, tipicamente l'apertura e la chiusura del telaio, sono facilmente impostabili con il motoriduttore già installato e senza l'uso di specifiche attrezzature, al di fuori di una comune chiave a brugola.

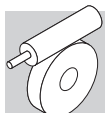
Una volta raggiunta e fissata la regolazione desiderata, questa viene mantenuta costante nel tempo, consentendo una elevata ripetibilità negli azionamenti.

Nella sua esecuzione di base il gruppo fine-corsa **RVS** è fornito con una coppia di cavi, della lunghezza di ca. un metro, pre-cablati internamente.

Il gruppo è inoltre disponibile anche nelle seguenti varianti:

**RVS ME:** dotato di scatola morsettiera esterna a sei terminali, ai quali allacciare i cavi di collegamento con i relais.

**RVS DM:** corredato di doppia serie di microinterruttori collegati in serie, per una sicurezza di intervento assoluta e conforme alle Norme che prevedono la ridondanza di questo dispositivo.

**RVS**

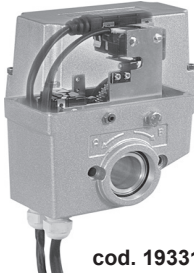
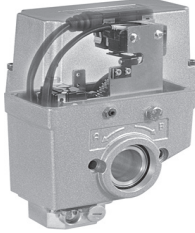
**RVS ME DM:** dispositivo dotato di morsettiera esterna e di doppia serie di microinterruttori, come più sopra descritto.

In tutte le sue varianti il dispositivo fine-corsa si caratterizza come:

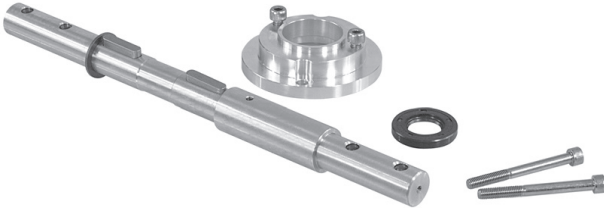
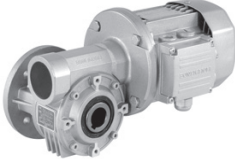
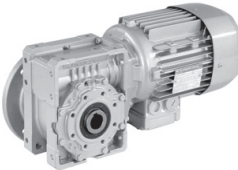
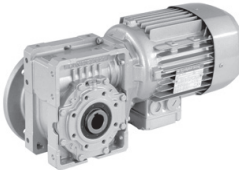
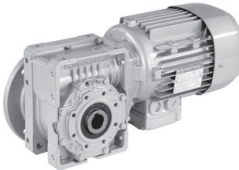
- estremamente silenzioso
- di ingombro contenuto
- di facile installazione e regolazione
- dotato di protezione complessiva IP55
- regolabile all'interno di un campo massimo di 43 giri dell'albero Lento

#### 40 CODICI PER L'ORDINATIVO

Individuare il dispositivo, o la sua variante, necessario per l'applicazione e riferirsi alla tabella sottostante per il relativo codice per l'ordinativo:

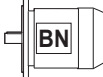
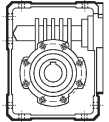
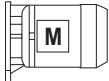
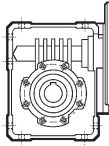
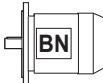
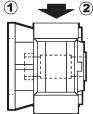
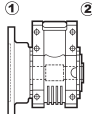
| RVS                                                                                | RVS ME                                                                             | RVS DM                                                                              | RVS ME DM                                                                            |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |  |  |
| cod. 193312025                                                                     | cod. 193312026                                                                     | cod. 193312027                                                                      | cod. 193312028                                                                       |

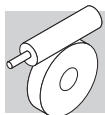
Selezionare inoltre il codice relativo al kit di configurazione per il riduttore sul quale si vuole installare il dispositivo fine-corsa:

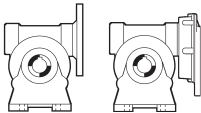
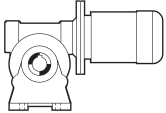
|                                                                                      |                                                                                     |                                                                                      |                                                                                       |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |                                                                                     |                                                                                      |                                                                                       |
| cod. 192860001                                                                       | cod. 192860002                                                                      | cod. 192860003                                                                       | cod. 192860004                                                                        |
|   |  |  |  |
| VF 49 F - VFR 49 F                                                                   | W 63 UFC - WR 63 UFC                                                                | W 75 UFC - WR 75 UFC                                                                 | W 86 UFC - WR 86 UFC                                                                  |

# 41 DESIGNAZIONE

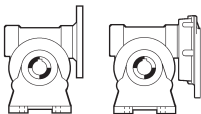
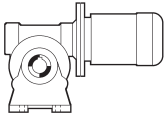
Designazione **VF** e **W** per accoppiamento al dispositivo fine-corsa.

|                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>W R 75 UFC1 D30 240 P71 B5 B3 ....</b>                                                                                                                                                                                                              |                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                                                        | <div>OPZIONI</div> <div>POSIZIONE DI MONTAGGIO</div> <div>B3 (default), B6, B7, B8, V5, V6</div>                                                                                                                                            |
|                                                                                                                                                                                                                                                        | <div>FLANGIA MOTORE IEC</div> <div>B5</div> <div>B14</div>                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                        | <div>INGRESSO TIPO</div> <div>VF: P (IEC)</div> <div>W: S_, P (IEC)</div>                                                                                                                                                                   |
|                                                                                                                                                                                                                                                        | <div>  <div>P63, P71</div>  </div>                                      |
|                                                                                                                                                                                                                                                        | <div>  <div>S1 ... S3</div>  </div>                                   |
|                                                                                                                                                                                                                                                        | <div>  <div>P63 ... P90</div>  </div>                               |
|                                                                                                                                                                                                                                                        | <div>RAPPORTO DI RIDUZIONE</div>                                                                                                                                                                                                            |
|                                                                                                                                                                                                                                                        | <div>DIAMETRO ALBERO LENTO</div> <div>D30 (solo W75)</div>                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                        | <div>FORMA COSTRUTTIVA</div> <div>VF: F</div> <div>W: UFC</div>                                                                                                                                                                             |
|                                                                                                                                                                                                                                                        | <div>  <div>F (1, 2)</div> </div> <div>  <div>UFC (1, 2)</div> </div> |
|                                                                                                                                                                                                                                                        | <div>GRANDEZZA</div> <div>VF: 49</div> <div>W: 63, 75, 86</div>                                                                                                                                                                             |
|                                                                                                                                                                                                                                                        | <div>PRECOPPIA</div> <div>/</div> <div>R</div>                                                                                                                                                                                              |
| <div>TIPO RIDUTTORE</div> <div>  <div>VF</div> </div> <div>  <div>W</div> </div> |                                                                                                                                                                                                                                             |

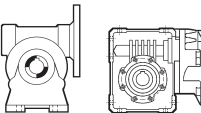
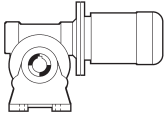
**RVS****42 TABELLE DI SELEZIONE MOTORIDUTTORE****0.12 kW**

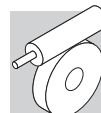
| $n_2$<br>min <sup>-1</sup> | $M_2$<br>Nm | i   |  | IEC  |  |
|----------------------------|-------------|-----|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>4.7</b>                 | 98          | 300 | <b>VFR 49_300</b>                                                                 | <b>P63 BN63A4</b>                                                                      |                                                                                     |
| <b>5.8</b>                 | 89          | 240 | <b>VFR 49_240</b>                                                                 | <b>P63 BN63A4</b>                                                                      |                                                                                     |
| <b>6.7</b>                 | 83          | 210 | <b>VFR 49_210</b>                                                                 | <b>P63 BN63A4</b>                                                                      |                                                                                     |
| <b>7.8</b>                 | 76          | 180 | <b>VFR 49_180</b>                                                                 | <b>P63 BN63A4</b>                                                                      |                                                                                     |
| <b>10.4</b>                | 64          | 135 | <b>VFR 49_135</b>                                                                 | <b>P63 BN63A4</b>                                                                      |                                                                                     |
| <b>14.0</b>                | 41          | 100 | <b>VF 49_100</b>                                                                  | <b>P63 BN63A4</b>                                                                      |                                                                                     |
| <b>17.5</b>                | 37          | 80  | <b>VF 49_80</b>                                                                   | <b>P63 BN63A4</b>                                                                      |                                                                                     |
| <b>20.0</b>                | 34          | 70  | <b>VF 49_70</b>                                                                   | <b>P63 BN63A4</b>                                                                      |                                                                                     |
| <b>23.3</b>                | 31          | 60  | <b>VF 49_60</b>                                                                   | <b>P63 BN63A4</b>                                                                      |                                                                                     |

**0.18 kW**

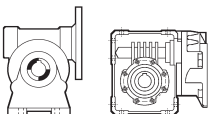
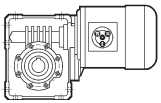
| $n_2$<br>min <sup>-1</sup> | $M_2$<br>Nm | i   |  | IEC  |  |
|----------------------------|-------------|-----|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>7.8</b>                 | 112         | 180 | <b>VFR 49_180</b>                                                                   | <b>P63 BN63B4</b>                                                                        |                                                                                       |
| <b>10.4</b>                | 95          | 135 | <b>VFR 49_135</b>                                                                   | <b>P63 BN63B4</b>                                                                        |                                                                                       |
| <b>14.0</b>                | 61          | 100 | <b>VF 49_100</b>                                                                    | <b>P63 BN63B4</b>                                                                        |                                                                                       |
| <b>17.5</b>                | 54          | 80  | <b>VF 49_80</b>                                                                     | <b>P63 BN63B4</b>                                                                        |                                                                                       |
| <b>20.0</b>                | 49          | 70  | <b>VF 49_70</b>                                                                     | <b>P63 BN63B4</b>                                                                        |                                                                                       |
| <b>23.3</b>                | 45          | 60  | <b>VF 49_60</b>                                                                     | <b>P63 BN63B4</b>                                                                        |                                                                                       |

**0.25 kW**

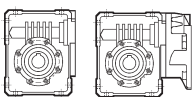
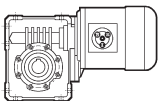
| $n_2$<br>min <sup>-1</sup> | $M_2$<br>Nm | i   |  | IEC  |  |
|----------------------------|-------------|-----|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>4.7</b>                 | 214         | 300 | <b>WR 63_300</b>                                                                    | <b>P71 BN71A4</b>                                                                        |                                                                                       |
| <b>5.8</b>                 | 192         | 240 | <b>WR 63_240</b>                                                                    | <b>P71 BN71A4</b>                                                                        |                                                                                       |
| <b>7.3</b>                 | 170         | 192 | <b>WR 63_192</b>                                                                    | <b>P71 BN71A4</b>                                                                        |                                                                                       |
| <b>10.4</b>                | 136         | 135 | <b>WR 63_135</b>                                                                    | <b>P71 BN71A4</b>                                                                        |                                                                                       |
| <b>12.3</b>                | 121         | 114 | <b>WR 63_114</b>                                                                    | <b>P71 BN71A4</b>                                                                        |                                                                                       |
| <b>14.0</b>                | 82          | 100 | <b>VF 49_100</b>                                                                    | <b>P71 BN71A4</b>                                                                        |                                                                                       |
| <b>17.5</b>                | 72          | 80  | <b>VF 49_80</b>                                                                     | <b>P71 BN71A4</b>                                                                        |                                                                                       |
| <b>20.0</b>                | 66          | 70  | <b>VF 49_70</b>                                                                     | <b>P71 BN71A4</b>                                                                        |                                                                                       |
| <b>23.3</b>                | 61          | 60  | <b>VF 49_60</b>                                                                     | <b>P71 BN71A4</b>                                                                        |                                                                                       |



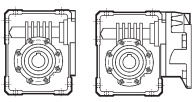
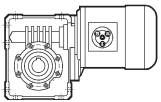
## 0.37 kW

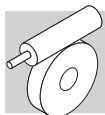
| $n_2$<br>min <sup>-1</sup> | $M_2$<br>Nm | i   |  | IEC  |  |                             |
|----------------------------|-------------|-----|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------|
| 4.7                        | 382         | 300 | WR 86_300                                                                         | P71                                                                                    | BN71B4                                                                              |                             |
| 5.8                        | 306         | 240 | WR 75_240                                                                         | P71                                                                                    | BN71B4                                                                              |                             |
| 7.3                        | 290         | 192 | WR 86_192                                                                         | P71                                                                                    | BN71B4                                                                              |                             |
| 7.8                        | 257         | 180 | WR 75_180                                                                         | P71                                                                                    | BN71B4                                                                              |                             |
| 9.3                        | 226         | 150 | WR 75_150                                                                         | P71                                                                                    | BN71B4                                                                              |                             |
| 10.4                       | 204         | 135 | WR 63_135                                                                         | P71                                                                                    | BN71B4                                                                              | W 63_100      S1      M1SD4 |
| 12.3                       | 181         | 114 | WR 63_114                                                                         | P71                                                                                    | BN71B4                                                                              |                             |
| 14.0                       | 133         | 100 | W 63_100                                                                          | P71                                                                                    | BN71B4                                                                              |                             |
| 17.5                       | 108         | 80  | VF 49_80                                                                          | P71                                                                                    | BN71B4                                                                              |                             |
| 20.0                       | 98.3        | 70  | VF 49_70                                                                          | P71                                                                                    | BN71B4                                                                              |                             |
| 23.3                       | 90.5        | 60  | VF 49_60                                                                          | P71                                                                                    | BN71B4                                                                              |                             |

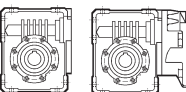
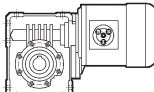
## 0.55 kW

| $n_2$<br>min <sup>-1</sup> | $M_2$<br>Nm | i   |  | IEC  |  |                                                                               |
|----------------------------|-------------|-----|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| 4.7                        | 559         | 300 | WR 86_300                                                                          | P80                                                                                     | BN80A4                                                                               |                                                                               |
| 5.8                        | 483         | 240 | WR 86_240                                                                          | P80                                                                                     | BN80A4                                                                               |                                                                               |
| 7.3                        | 423         | 192 | WR 86_192                                                                          | P80                                                                                     | BN80A4                                                                               |                                                                               |
| 7.8                        | 376         | 180 | WR 75_180                                                                          | P80                                                                                     | BN80A4                                                                               |                                                                               |
| 8.3                        | 383         | 168 | WR 86_168                                                                          | P80                                                                                     | BN80A4                                                                               |                                                                               |
| 9.3                        | 331         | 150 | WR 75_150                                                                          | P80                                                                                     | BN80A4                                                                               | W 63_100 S1 M1LA4<br>W 63_80 S1 M1LA4<br>W 63_64 S1 M1LA4<br>W 75_60 S1 M1LA4 |
| 10.1                       | 330         | 138 | WR 86_138                                                                          | P80                                                                                     | BN80A4                                                                               |                                                                               |
| 11.7                       | 287         | 120 | WR 75_120                                                                          | P80                                                                                     | BN80A4                                                                               |                                                                               |
| 14.0                       | 194         | 100 | W 63_100                                                                           | P80                                                                                     | BN80A4                                                                               |                                                                               |
| 17.5                       | 170         | 80  | W 63_80                                                                            | P80                                                                                     | BN80A4                                                                               |                                                                               |
| 21.9                       | 148         | 64  | W 63_64                                                                            | P80                                                                                     | BN80A4                                                                               |                                                                               |
| 23.3                       | 148         | 60  | W 75_60                                                                            | P80                                                                                     | BN80A4                                                                               |                                                                               |

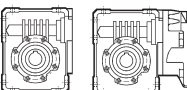
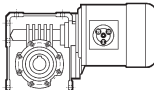
## 0.75 kW

| $n_2$<br>min <sup>-1</sup> | $M_2$<br>Nm | i   |  | IEC  |  |          |    |       |
|----------------------------|-------------|-----|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------|----|-------|
| 7.3                        | 568         | 192 | WR 86_192                                                                           | P80                                                                                      | BN80B4                                                                                |          |    |       |
| 8.3                        | 514         | 168 | WR 86_168                                                                           | P80                                                                                      | BN80B4                                                                                |          |    |       |
| 9.3                        | 444         | 150 | WR 75_150                                                                           | P80                                                                                      | BN80B4                                                                                |          |    |       |
| 10.1                       | 443         | 138 | WR 86_138                                                                           | P80                                                                                      | BN80B4                                                                                |          |    |       |
| 11.7                       | 386         | 120 | WR 75_120                                                                           | P80                                                                                      | BN80B4                                                                                |          |    |       |
| 14.0                       | 281         | 100 | W 75_100                                                                            | P80                                                                                      | BN80B4                                                                                | W 75_100 | S2 | M2SA4 |
| 17.5                       | 241         | 80  | W 75_80                                                                             | P80                                                                                      | BN80B4                                                                                | W 75_80  | S2 | M2SA4 |
| 21.9                       | 199         | 64  | W 63_64                                                                             | P80                                                                                      | BN80B4                                                                                | W 63_64  | S2 | M2SA4 |
| 23.3                       | 199         | 60  | W 75_60                                                                             | P80                                                                                      | BN80B4                                                                                | W 75_60  | S2 | M2SA4 |

**RVS****1.1 kW**

| $n_2$<br>min <sup>-1</sup> | M <sub>2</sub><br>Nm | i   |  | IEC  |  |
|----------------------------|----------------------|-----|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 10.1                       | 652                  | 138 | WR 86_138                                                                         | P90 BN90S4                                                                             |                                                                                     |
| 11.7                       | 594                  | 120 | WR 86_120                                                                         | P90 BN90S4                                                                             |                                                                                     |
| 14.0                       | 443                  | 100 | W 86_100                                                                          | P90 BN90S4                                                                             | W 86_100 S2 M2SB4                                                                   |
| 17.5                       | 384                  | 80  | W 86_80                                                                           | P90 BN90S4                                                                             | W 86_80 S2 M2SB4                                                                    |
| 21.9                       | 326                  | 64  | W 86_64                                                                           | P90 BN90S4                                                                             | W 86_60 S2 M2SB4                                                                    |

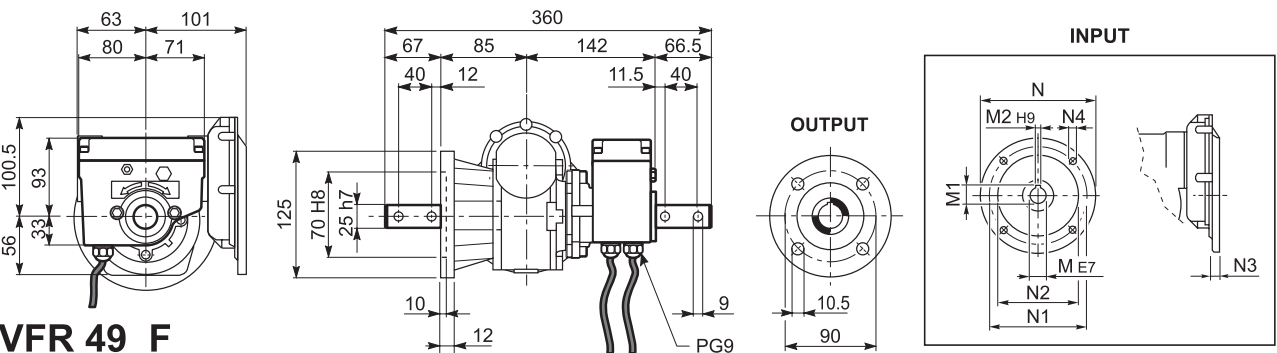
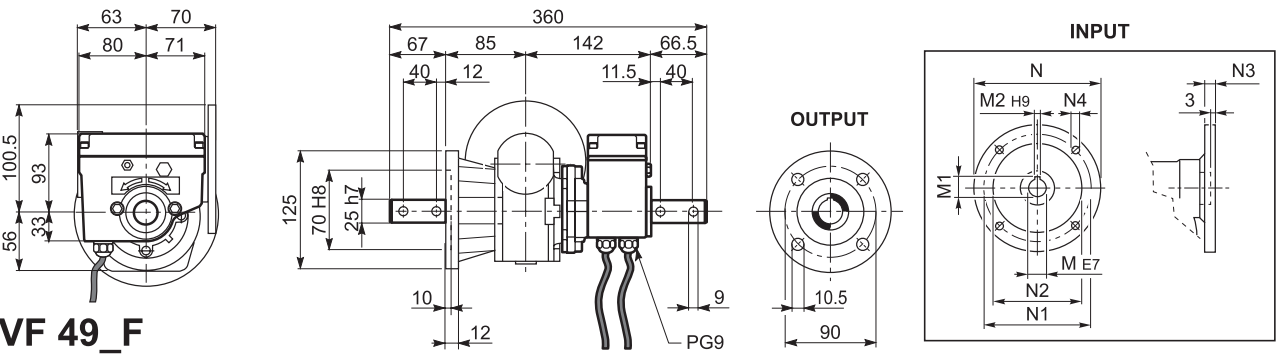
**1.5 kW**

| $n_2$<br>min <sup>-1</sup> | $M_2$<br>Nm | i   |  | IEC  |  |
|----------------------------|-------------|-----|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 11.7                       | 816         | 120 | WR 86_120                                                                         | P90 BN90LA4                                                                            |                                                                                     |
| 17.5                       | 527         | 80  | W 86_80                                                                           | P90 BN90LA4                                                                            | W 86_80 S3 M3SA4                                                                    |
| 21.9                       | 448         | 64  | W 86_64                                                                           | P90 BN90LA4                                                                            | W 86_60 S3 M3SA4                                                                    |

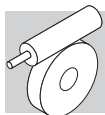
43

DIMENSIONI

VF 49\_F - VFR 49\_F

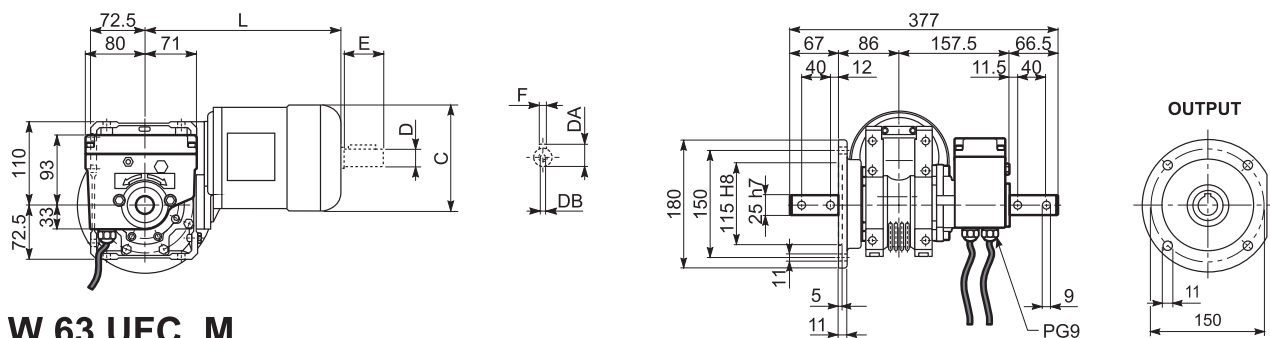


|             | M  | M1   | M2 | N   | N1  | N2  | N3   | N4    |
|-------------|----|------|----|-----|-----|-----|------|-------|
| VF 49_P 63  | 11 | 12.8 | 4  | 140 | 115 | 95  | 10.5 | 9.5   |
| VF 49_P 71  | 14 | 16.3 | 5  | 160 | 130 | 110 | 10.5 | 9.5   |
| VFR 49_P 63 | 11 | 12.8 | 4  | 140 | 115 | 95  | 11   | M8x19 |



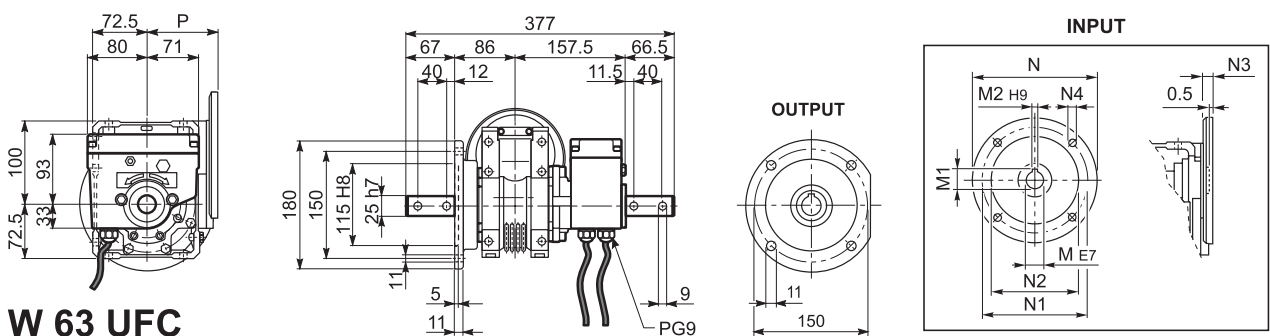
**RVS**

## W 63 UFC\_M - W 63 UFC - WR 63 UFC

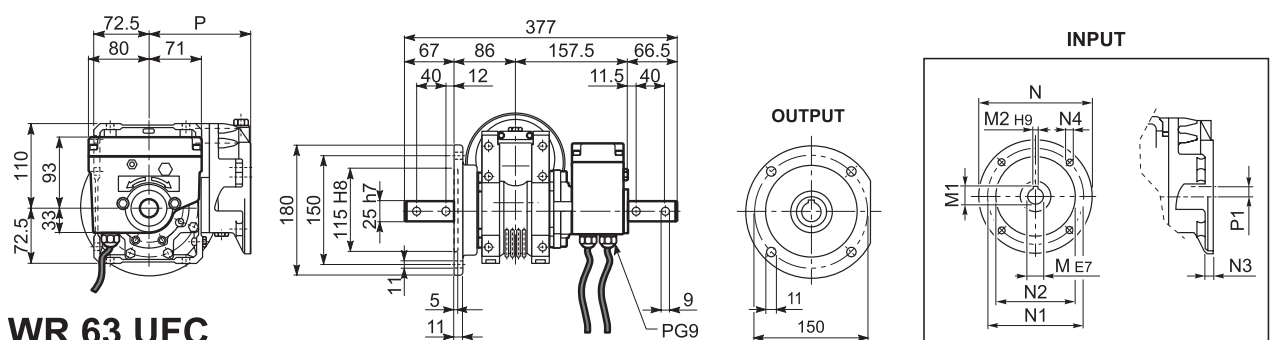


**W 63 UFC\_M**

|                    | C   | D  | DA   | DB | E  | F | L   |
|--------------------|-----|----|------|----|----|---|-----|
| <b>W 63_S1 M1L</b> | 138 | 14 | 16   | M5 | 30 | 5 | 289 |
| <b>W 63_S2 M2S</b> | 156 | 19 | 21.5 | M6 | 40 | 6 | 317 |

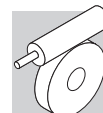


**W 63 UFC**

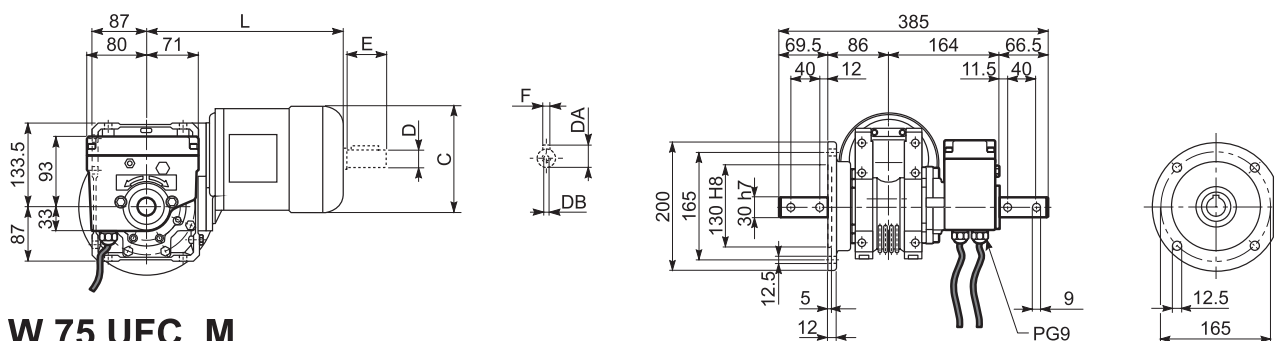


**WR 63 UFC**

|                   | M  | M1   | M2 | N   | N1  | N2  | N3 | N4    | P     | P1    |
|-------------------|----|------|----|-----|-----|-----|----|-------|-------|-------|
| <b>W 63_P 71</b>  | 14 | 16.3 | 5  | 160 | 130 | 110 | 11 | 9     | 95    | -     |
| <b>W 63_P 80</b>  | 19 | 21.8 | 6  | 200 | 165 | 130 | 12 | 11.5  | 102   | -     |
| <b>W 63_P 90</b>  | 24 | 27.3 | 8  | 200 | 165 | 130 | 12 | 11.5  | 102   | -     |
| <b>WR 63_P 63</b> | 11 | 12.8 | 4  | 140 | 115 | 95  | 10 | M8x10 | 133.5 | 11.42 |
| <b>WR 63_P 71</b> | 14 | 16.3 | 5  | 160 | 130 | 110 | 10 | M8x10 | 133.5 | 11.42 |

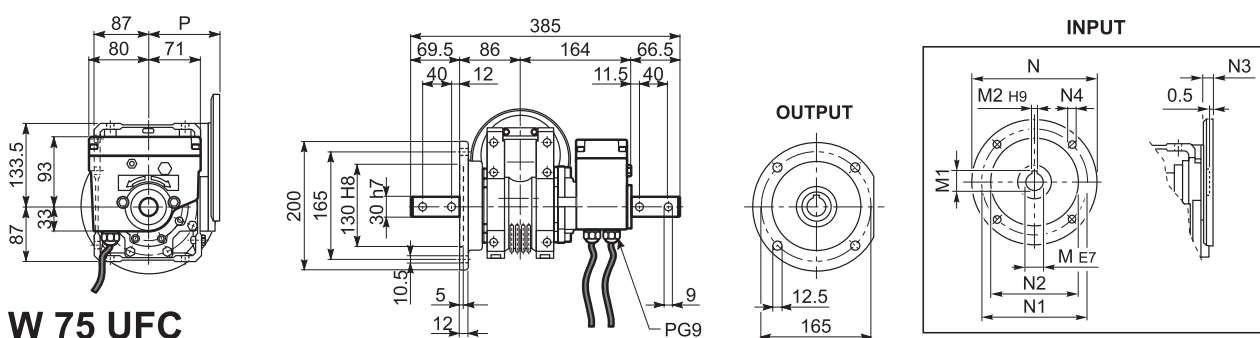


## W 75 UFC\_M - W 75 UFC - WR 75 UFC

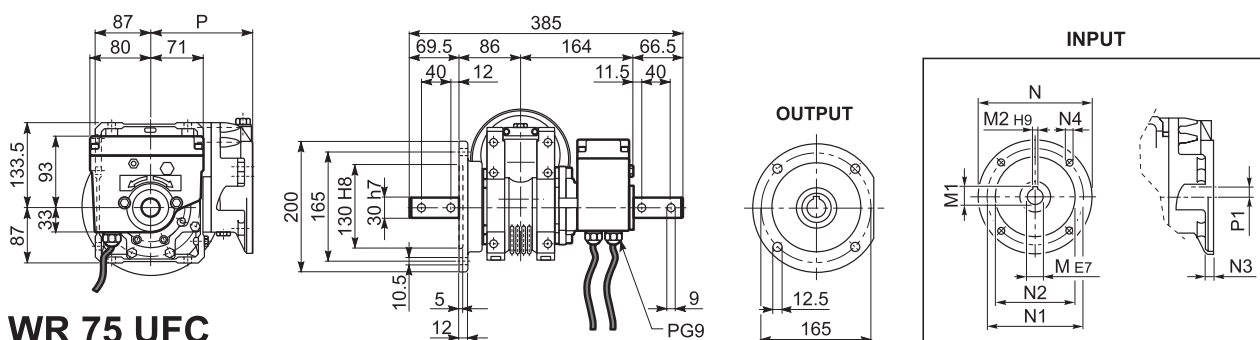


**W 75 UFC\_M**

|             | C   | D  | DA   | DB  | E  | F | L   |
|-------------|-----|----|------|-----|----|---|-----|
| W 75_S1 M1L | 138 | 14 | 16   | M5  | 30 | 5 | 308 |
| W 75_S2 M2S | 156 | 19 | 21.5 | M6  | 40 | 6 | 333 |
| W 75_S3 M3S | 193 | 28 | 31   | M10 | 60 | 8 | 376 |
| W 75_S3 M3L | 193 | 28 | 31   | M10 | 60 | 8 | 408 |

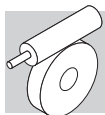


**W 75 UFC**



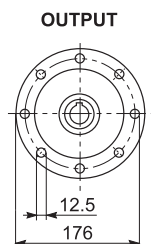
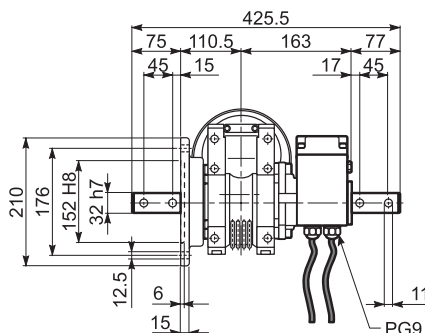
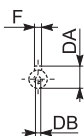
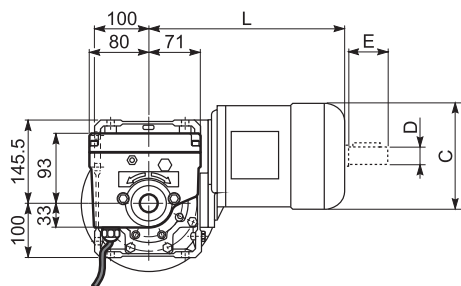
**WR 75 UFC**

|            | M  | M1   | M2 | N   | N1  | N2  | N3 | N4     | P     | P1    |
|------------|----|------|----|-----|-----|-----|----|--------|-------|-------|
| W 75_P 71  | 14 | 16.3 | 5  | 160 | 130 | 110 | 11 | 9      | 112   | -     |
| W 75_P 80  | 19 | 21.8 | 6  | 200 | 165 | 130 | 12 | 11.5   | 112   | -     |
| W 75_P 90  | 24 | 27.3 | 8  | 200 | 165 | 130 | 12 | 11.5   | 112   | -     |
| WR 75_P 63 | 11 | 12.8 | 4  | 140 | 115 | 95  | 10 | M8x10  | 152   | 23.53 |
| WR 75_P 71 | 14 | 16.3 | 5  | 160 | 130 | 110 | 10 | M8x10  | 152   | 23.53 |
| WR 75_P 80 | 19 | 21.8 | 6  | 200 | 165 | 130 | 12 | M10x13 | 163.5 | 11    |
| WR 75_P 90 | 24 | 27.3 | 8  | 200 | 165 | 130 | 12 | M10x13 | 163.5 | 11    |



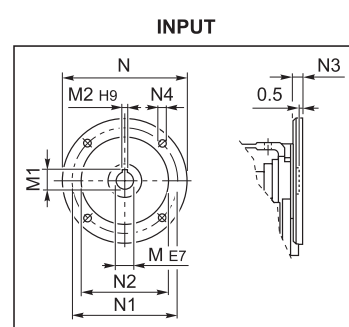
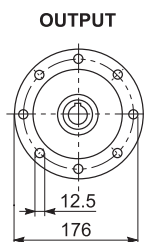
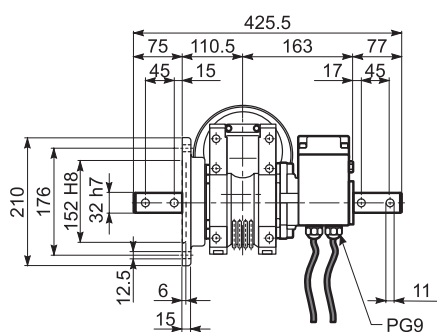
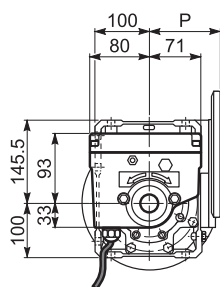
**RVS**

## W 86 UFC\_M - W 86 UFC - WR 86 UFC

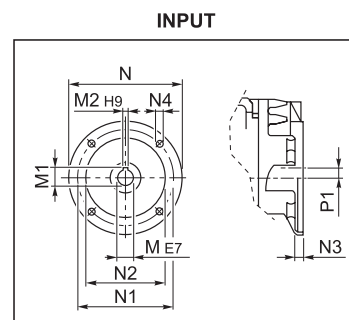
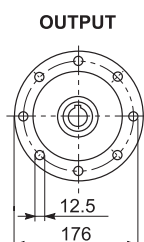
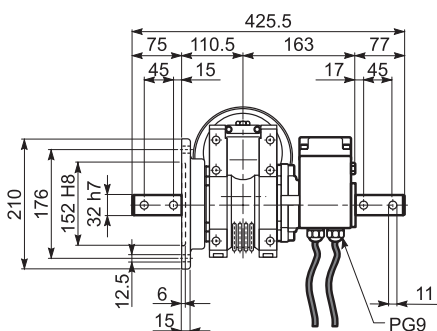
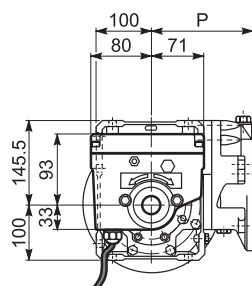


### W 86 UFC\_M

|             | C   | D  | DA   | DB  | E  | F | L   |
|-------------|-----|----|------|-----|----|---|-----|
| W 86_S1 M1L | 138 | 14 | 16   | M5  | 30 | 5 | 324 |
| W 86_S2 M2S | 156 | 19 | 21.5 | M6  | 40 | 6 | 349 |
| W 86_S3 M3S | 193 | 28 | 31   | M10 | 60 | 8 | 392 |
| W 86_S3 M3L | 193 | 28 | 31   | M10 | 60 | 8 | 424 |

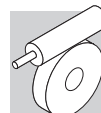


### W 86 UFC



### WR 86 UFC

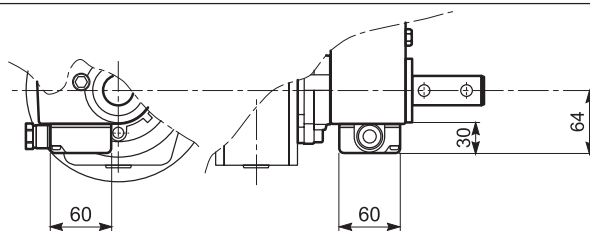
|            | M  | M1   | M2 | N   | N1  | N2  | N3 | N4     | P     | P1   |
|------------|----|------|----|-----|-----|-----|----|--------|-------|------|
| W 86_P 71  | 14 | 16.3 | 5  | 160 | 130 | 110 | 11 | 9      | 128   | -    |
| W 86_P 80  | 19 | 21.8 | 6  | 200 | 165 | 130 | 12 | 11.5   | 128   | -    |
| W 86_P 90  | 24 | 27.3 | 8  | 200 | 165 | 130 | 12 | 11.5   | 128   | -    |
| WR 86_P 63 | 11 | 12.8 | 4  | 140 | 115 | 95  | 10 | M8x10  | 168   | 35.4 |
| WR 86_P 71 | 14 | 16.3 | 5  | 160 | 130 | 110 | 10 | M8x10  | 168   | 35.4 |
| WR 86_P 80 | 19 | 21.8 | 6  | 200 | 165 | 130 | 12 | M10x13 | 179.5 | 22.9 |
| WR 86_P 90 | 24 | 27.3 | 8  | 200 | 165 | 130 | 12 | M10x13 | 179.5 | 22.9 |



## 44 OPZIONI

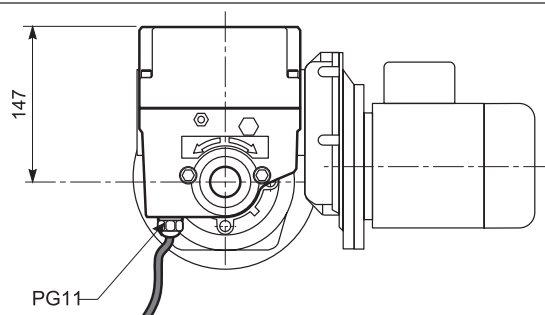
### Varianti fine corsa

#### ME

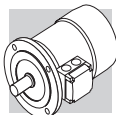


Versione con morsettiera

#### DM



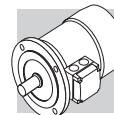
Versione con doppi micro



## MOTORI ELETTRICI

### M1 SIMBOLOGIA E UNITÀ DI MISURA

| Simbolo       | Unità di misura     | Descrizione                      | Simbolo    | Unità di misura     | Descrizione                                                         |
|---------------|---------------------|----------------------------------|------------|---------------------|---------------------------------------------------------------------|
| $\cos\varphi$ | –                   | Fattore di potenza               | $n$        | $[\text{min}^{-1}]$ | Velocità nominale                                                   |
| $\eta$        | –                   | Rendimento                       | $P_B$      | [W]                 | Potenza assorbita dal freno a 20°C                                  |
| $f_m$         | –                   | Fattore correttivo della potenza | $P_n$      | [kW]                | Potenza nominale                                                    |
| $I$           | –                   | Rapporto di intermittenza        | $P_r$      | [kW]                | Potenza richiesta                                                   |
| $I_N$         | [A]                 | Corrente nominale                | $t_1$      | [ms]                | Ritardo di sblocco del freno con alimentatore a semionda            |
| $I_s$         | [A]                 | Corrente di spunto               | $t_{1s}$   | [ms]                | Tempo di sblocco del freno con alimentatore a controllo elettronico |
| $J_C$         | [Kgm <sup>2</sup> ] | Momento di inerzia del carico    | $t_2$      | [ms]                | Ritardo di frenatura con disgiunzione lato c.a.                     |
| $J_M$         | [Kgm <sup>2</sup> ] | Momento di inerzia motore        | $t_{2c}$   | [ms]                | Ritardo di frenatura con disgiunzione circuito c.a. e c.c.          |
| $K_C$         | –                   | Fattore di coppia                | $t_a$      | [°C]                | Temperatura ambiente                                                |
| $K_d$         | –                   | Fattore di carico                | $t_f$      | [min]               | Tempo di funzionamento a carico costante                            |
| $K_J$         | –                   | Fattore di inerzia               | $t_r$      | [min]               | Tempo di riposo                                                     |
| $M_A$         | [Nm]                | Coppia accelerante media         | $W$        | [J]                 | Lavoro di frenatura accumulato tra due regolazioni del traferro     |
| $M_B$         | [Nm]                | Coppia frenante                  | $W_{\max}$ | [J]                 | Energia massima per singola frenatura                               |
| $M_N$         | [Nm]                | Coppia nominale                  | $Z$        | [1/h]               | N° di avviamenti ammissibili, a carico                              |
| $M_L$         | [Nm]                | Coppia resistente media          | $Z_0$      | [1/h]               | N° di avviamenti ammissibili a vuoto ( $I = 50\%$ )                 |
| $M_s$         | [Nm]                | Coppia di spunto                 |            |                     |                                                                     |



## M2 CARATTERISTICHE GENERALI

### M2.1 Programma di produzione

I motori elettrici asincroni trifase del programma di produzione della BONFIGLIOLI RIDUTTORI sono previsti nelle forme costruttive base IMB5, IMB14 e loro derivate con le seguenti polarità: 2, 4, 6, 2/4, 2/6, 2/8, 2/12.

Nel presente catalogo sono evidenziate inoltre, le caratteristiche tecniche dei motori in versione integrata, tipo M.

### M2.2 Normative

I motori descritti in questo catalogo sono costruiti in accordo alle Norme ed unificazioni applicabili evidenziate nella tabella seguente.

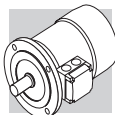
(F 1)

| Titolo                                                                                            | CEI             | IEC          |
|---------------------------------------------------------------------------------------------------|-----------------|--------------|
| Prescrizioni generali per macchine elettriche rotanti                                             | CEI EN 60034-1  | IEC 60034-1  |
| Marcatura dei terminali e senso di rotazione per macchine elettriche rotanti                      | CEI 2-8         | IEC 60034-8  |
| Metodi di raffreddamento delle macchine elettriche                                                | CEI EN 60034-6  | IEC 60034-6  |
| Dimensioni e potenze nominali per macchine elettriche rotanti                                     | EN 50347        | IEC 60072    |
| Classificazione dei gradi di protezione delle macchine elettriche rotanti                         | CEI EN 60034-5  | IEC 60034-5  |
| Limiti di rumorosità                                                                              | CEI EN 60034-9  | IEC 60034-9  |
| Sigle di designazione delle forme costruttive e dei tipi di installazione                         | CEI EN 60034-7  | IEC 60034-7  |
| Tensione nominale per i sistemi di distribuzione pubblica dell'energia elettrica a bassa tensione | CEI 8-6         | IEC 60038    |
| Grado di vibrazione delle macchine elettriche                                                     | CEI EN 60034-14 | IEC 60034-14 |

I motori corrispondono inoltre alle Norme straniere adeguate alle IEC 60034-1 e qui riportate.

(F 2)

|                 |               |
|-----------------|---------------|
| DIN VDE 0530    | Germania      |
| BS5000 / BS4999 | Gran Bretagna |
| AS 1359         | Australia     |
| NBNC 51 - 101   | Belgio        |
| NEK - IEC 34    | Norvegia      |
| NF C 51         | Francia       |
| O EVE M 10      | Austria       |
| SEV 3009        | Svizzera      |
| NEN 3173        | Paesi Bassi   |
| SS 426 01 01    | Svezia        |



## M2.3 Motori per USA e Canada

### CUS

I motori sono disponibili in esecuzione NEMA Design C (per le caratteristiche elettriche), certificata in conformità alle norme CSA (Canadian Standard) C22.2 N° 100 e UL (Underwriters Laboratory) UL 1004-1 con targhetta riportante entrambi i marchi sotto illustrati, specificare in questo caso l'opzione CUS.



L'opzione CUS non è applicabile ai motori dotati di servoventilazione.

Le tensioni delle reti di distribuzione americane e le corrispondenti tensioni nominali da specificare per il motore sono indicate nella tabella seguente:

(F 3)

| Frequenza | Tensione di rete | V <sub>mot</sub> |
|-----------|------------------|------------------|
| 60 Hz     | 208 V            | <b>200 V</b>     |
|           | 240 V            | <b>230 V</b>     |
|           | 480 V            | <b>460 V</b>     |
|           | 600 V            | <b>575 V</b>     |

L'opzione CUS è applicabile anche ai motori a 50 Hz.

I motori con tensione di alimentazione in rapporto 2 (es. 230/460-60; 220/440-60) presentano di serie una morsettiera a 9 terminali.

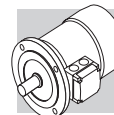
Per le stesse esecuzioni, e inoltre per l'alimentazione 575V-60Hz, la potenza di targa corrisponde a quella normalizzata a 50Hz.

Per i motori autofrenanti con freno in c.c. tipo BN/M\_FD l'alimentazione del raddrizzatore è da morsettiera motore con tensione 230V a.c. monofase.

Per i motori autofrenanti **l'alimentazione del freno** è così predisposta:

(F 4)

| BN_FD                             | BN_FA                                | Specificare |
|-----------------------------------|--------------------------------------|-------------|
| Da morsettiera motore 1~230V c.a. | Alimentazione separata 230V Δ - 60Hz | 230SA       |
|                                   | Alimentazione separata 460V Y - 60Hz | 460SA       |



## M2.4 China Compulsory Certification

**CCC**

I motori elettrici destinati ad essere commercializzati nella Repubblica Popolare Cinese rientrano nell'applicabilità del sistema di certificazione CCC (China Compulsory Certification). I motori BN con coppia nominale fino a 7Nm sono disponibili con certificazione CCC e targhetta speciale riportante il marchio sotto illustrato:



L'opzione CCC non è applicabile ai motori dotati di servoventilazione.

## M2.5 Direttive 2006/95/CE (LVD) e 2004/108/CE (EMC)

I motori delle serie BN ed M sono conformi ai requisiti delle Direttive 2006/95/CE (Direttiva Bassa Tensione) e 2004/108/CE (Direttiva Compatibilità Elettromagnetica), e riportano in targa la marcatura CE. Per quanto riguarda la Direttiva EMC, la costruzione è in accordo alle Norme CEI EN 60034-1, EN 61000-6-2, EN 61000-6-4.

I motori con freno in c.c. tipo FD, se corredati dell'opportuno filtro capacitivo in ingresso al raddrizzatore (opzione **CF**), rientrano nei limiti di emissione previsti dalla Norma EN 61000-6-3:2007 "Compatibilità elettromagnetica - Norma Generica sull'emissione - Parte 6-3: Ambienti residenziali, commerciali e dell'industria leggera".

I motori soddisfano inoltre le prescrizioni della Norma CEI EN 60204-1 "Equipaggiamento elettrico delle macchine".

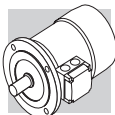
È responsabilità del costruttore o dell'assemblatore dell'apparecchiatura che incorpora i motori come componenti garantire la sicurezza e la conformità alle direttive del prodotto finale.

## M2.6 Tolleranze

Secondo le Norme CEI EN 60034-1, per le grandezze garantite sono ammesse le tolleranze qui indicate:

|       |                                                                   |                            |
|-------|-------------------------------------------------------------------|----------------------------|
| (F 5) | $-0.15 (1 - \eta) \quad P \leq 50\text{kW}$                       | Rendimento                 |
|       | $-(1 - \cos\phi)/6 \quad \text{min } 0.02 \quad \text{max } 0.07$ | Fattore di potenza         |
|       | $\pm 20\% *$                                                      | Scorrimento                |
|       | +20%                                                              | Corrente a rotore bloccato |
|       | -15% +25%                                                         | Coppia a rotore bloccato   |
|       | -10%                                                              | Coppia max                 |

\*  $\pm 30\%$  per motori con  $P_n < 1 \text{ kW}$



## M3 CARATTERISTICHE MECCANICHE

### M3.1 Forme costruttive

I motori serie BN sono previsti nelle forme costruttive indicate in tabella (F6) secondo le Norme CEI EN 60034-14.

Le forme costruttive sono le seguenti:

**IM B5** (base)

IM V1, IM V3 (derivate)

**IM B14** (base)

IM V18, IMV19 (derivate)

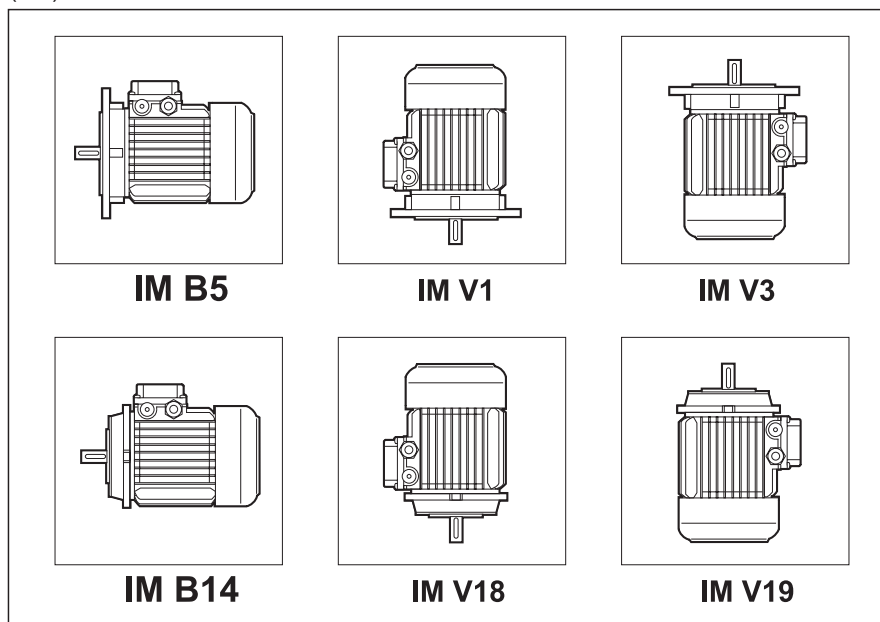
I motori in forma costruttiva IM B5 possono essere installati nelle posizioni IM V1 e IM V3; i motori in forma costruttiva IM B14 possono essere installati nelle posizioni IM V18 e IM V19.

In questi casi, sulla targa del motore sarà indicata la forma costruttiva base IM B5 o IM B14.

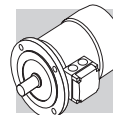
Nelle forme costruttive dove il motore assume una posizione verticale con albero in basso, si consiglia di richiedere l'esecuzione con tettuccio parapioggia (da prevedere sempre nel caso di motori autofrenanti).

Tale esecuzione, pressente nelle opzioni, va richiesta espressamente in fase di ordine in quanto non è prevista nella versione base.

(F 6)



I motori in forma flangiata possono essere forniti con dimensioni di accoppiamento ridotte, come riportato nella tabella seguente - esecuzioni **B5R**, **B14R**. Il loro utilizzo in abbinamento ai riduttori dovrà in ogni caso risultare coerente con la massima potenza installabile sui riduttori stessi (vedere i capitoli "Predisposizioni motori"). Nei casi in cui non sia rispettata questa condizione occorre contattare il Servizio Tecnico per la verifica dell'abbinamento.



(F 7)

|                            |              |              |              |               |               |               |
|----------------------------|--------------|--------------|--------------|---------------|---------------|---------------|
|                            |              |              |              |               |               |               |
|                            | <b>BN 71</b> | <b>BN 80</b> | <b>BN 90</b> | <b>BN 100</b> | <b>BN 112</b> | <b>BN 132</b> |
|                            | DxE - Ø      |              |              |               |               |               |
| <b>B5R</b> <sup>(1)</sup>  | 11x23 - 140  | 14x30 - 160  | 19x40 - 200  | 24x50 - 200   | 24x50 - 200   | 28x60 - 250   |
| <b>B14R</b> <sup>(2)</sup> | 11x23 - 90   | 14x30 - 105  | 19x40 - 120  | 24x50 - 140   | —             | —             |

(1) flangia con fori passanti

(2) flangia con fori filettati

### M3.2 Grado di protezione

**IP..**

La tabella sottostante riassume la disponibilità dei vari gradi di protezione.

Indipendentemente dal grado di protezione specificato, per installazione all'aperto i motori devono essere protetti dall'irraggiamento diretto e, nel caso d'installazione con albero rivolto verso il basso, è necessario specificare ulteriormente il tettuccio di protezione contro l'ingresso di acqua e corpi solidi (opzione **RC**).

(F 8)

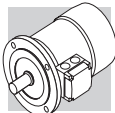
|                              |                            |              |              |              |
|------------------------------|----------------------------|--------------|--------------|--------------|
|                              |                            | <b>IP 54</b> | <b>IP 55</b> | <b>IP 56</b> |
| <b>BN</b>                    | <b>M</b>                   |              | standard     |              |
| <b>BN_FD</b><br><b>BN_FA</b> | <b>M_FD</b><br><b>M_FA</b> | standard     |              |              |

### M3.3 Ventilazione

I motori sono raffreddati mediante ventilazione esterna (IC 411 secondo CEI EN 60034-6) e sono provvisti di ventola radiale in plastica che funziona in entrambi i sensi di rotazione.

L'installazione deve assicurare una distanza minima dalla calotta copriventola alla parete in modo da non avere impedimenti all'ingresso aria e permettere la possibilità di eseguire l'opportuna manutenzione del motore e, se previsto, del freno.

Su richiesta è possibile prevedere una ventilazione forzata indipendente (opzione U1). Questa soluzione consente di aumentare il fattore di utilizzo del motore nel caso di alimentazione da inverter e funzionamento a giri ridotti.



### M3.4 Senso di rotazione

È possibile il funzionamento in entrambi i sensi di rotazione.

Con collegamento dei morsetti U1,V1,W1 alle fasi di linea L1,L2,L3 si ha rotazione oraria vista dal lato accoppiamento, mentre la marcia antioraria si ottiene scambiando fra loro due fasi.

### M3.5 Rumorosità

I valori di rumorosità, rilevati secondo il metodo previsto dalle Norme ISO 1680, sono contenuti entro i livelli massimi previsti dalle Norme CEI EN 60034-9.

### M3.6 Vibrazioni ed equilibratura

Tutti i rotor sono equilibrati con mezza linguetta e rientrano nei limiti di intensità di vibrazione previsti dalle Norme CEI EN 60034-14.

Per particolari esigenze di silenziosità potrà essere previsto, a richiesta, un'esecuzione antivibrante in grado ridotto B. La tabella seguente riporta i valori della velocità efficace di vibrazione per equilibratura standard (A) e incrementata (B).

(F 9)

| Grado di vibrazione | Velocità di rotazione<br><br>n [min <sup>-1</sup> ] | Limiti della velocità di vibrazione<br><br>[mm/s]<br><b>BN 56 ≤ H ≤ BN 200</b><br><b>M05 ≤ H ≤ M5</b> |
|---------------------|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>A</b>            | 600 < n < 3600                                      | 1.6                                                                                                   |
| <b>B</b>            | 600 < n < 3600                                      | 0.70                                                                                                  |

I valori si riferiscono a misure con motore liberamente sospeso e funzionamento a vuoto.

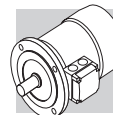
### M3.7 Morsettiera motore

La morsettiera principale è a sei morsetti per collegamento con capicorda (esecuzione a 9 morsetti per tensioni americane "Dual Voltage"). All'interno della scatola è previsto un morsetto per il conduttore di terra. Le dimensioni dei perni di attacco sono riportate nella tabella seguente.

Per l'alimentazione del freno vedi par. M6 (freno FD), M7 (freno FA).

Nel caso di motori autofrenanti, il raddrizzatore per l'alimentazione del freno è fissato all'interno della scatola e provvisto di adeguati morsetti di collegamento.

Eseguire i collegamenti secondo gli schemi riportati all'interno della scatola coprimorsetti o nei manuali d'uso.



(F 10)

|  |  | N° terminali | Filettatura terminali | Sezione max. del conduttore mm <sup>2</sup> |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------|-----------------------|---------------------------------------------|
| <b>BN 56 ... BN 71</b>                                                            | <b>M05, M1</b>                                                                    | 6            | M4                    | 2.5                                         |
| <b>BN 80, BN 90</b>                                                               | <b>M2</b>                                                                         | 6            | M4                    | 2.5                                         |
| <b>BN 100 ... BN 112</b>                                                          | <b>M3</b>                                                                         | 6            | M5                    | 6                                           |
| <b>BN 132 ... BN 160MR</b>                                                        | <b>M4</b>                                                                         | 6            | M5                    | 6                                           |
| <b>BN 160M ... BN 180M</b>                                                        | <b>M5</b>                                                                         | 6            | M6                    | 16                                          |
| <b>BN 180L ... BN 200L</b>                                                        | —                                                                                 | 6            | M8                    | 25                                          |
| <b>BN 63 ... BN 160MR</b>                                                         | <b>M05 ... M4</b>                                                                 | 9            | M4                    | 6                                           |
| <b>BN 160M ... BN 200L</b>                                                        | <b>M5</b>                                                                         | 9            | M6                    | 16                                          |

### M3.8 Ingresso cavi

Nel rispetto della Norma EN 50262, i fori di ingresso cavi nelle scatole morsettiera presentano filettature metriche della misura indicata nella tabella seguente.

(F 11)

|  |  | Ingresso cavi | Diametro max. cavo allacciabile [mm] |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------|--------------------------------------|
| <b>BN 63</b>                                                                       | <b>M05</b>                                                                         | 2 x M20 x 1.5 | 13                                   |
| <b>BN 71</b>                                                                       | <b>M1</b>                                                                          | 2 x M25 x 1.5 | 17                                   |
| <b>BN 80 - BN 90</b>                                                               | <b>M2</b>                                                                          | 2 x M25 x 1.5 | 17                                   |
| <b>BN 100</b>                                                                      | <b>M3</b>                                                                          | 2 x M32 x 1.5 | 21                                   |
|                                                                                    |                                                                                    | 2 x M25 x 1.5 | 17                                   |
| <b>BN 112</b>                                                                      | —                                                                                  | 2 x M32 x 1.5 | 21                                   |
|                                                                                    |                                                                                    | 2 x M25 x 1.5 | 17                                   |
| <b>BN 132...BN 160MR</b>                                                           | <b>M4</b>                                                                          | 4 x M32 x 1.5 | 21                                   |
| <b>BN 160M...BN 200L</b>                                                           | <b>M5</b>                                                                          | 2 x M40 x 1.5 | 28                                   |

### M3.9 Cuscinetti

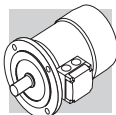
I cuscinetti previsti sono del tipo radiale a sfere con lubrificazione permanente precaricati assialmente. I tipi utilizzati sono indicati nelle tabelle seguenti. La durata nominale a fatica  $L_{10h}$  dei cuscinetti, in assenza di carichi esterni applicati è superiore a 40.000 ore, calcolata secondo ISO 281.

**DE** = lato comando

**NDE** = lato opposto comando

(F 12)

|  | <b>DE</b>            | <b>NDE</b> |                   |
|-------------------------------------------------------------------------------------|----------------------|------------|-------------------|
|                                                                                     | <b>M, M_FD, M_FA</b> | <b>M</b>   | <b>M_FD, M_FA</b> |
| <b>M05</b>                                                                          | 6004 2Z C3           | 6201 2Z C3 | 6201 2RS C3       |
| <b>M1</b>                                                                           | 6004 2Z C3           | 6202 2Z C3 | 6202 2RS C3       |
| <b>M2</b>                                                                           | 6007 2Z C3           | 6204 2Z C3 | 6204 2RS C3       |
| <b>M3</b>                                                                           | 6207 2Z C3           | 6206 2Z C3 | 6206 2RS C3       |
| <b>M4</b>                                                                           | 6309 2Z C3           | 6308 2Z C3 | 6308 2RS C3       |
| <b>M5</b>                                                                           | 6309 2Z C3           | 6309 2Z C3 | 6309 2RS C3       |



(F 13)

|  | DE         | NDE        |                |
|-----------------------------------------------------------------------------------|------------|------------|----------------|
|                                                                                   | BN         | BN         | BN_FD<br>BN_FA |
| <b>BN 56</b>                                                                      | 6201 2Z C3 | 6201 2Z C3 | —              |
| <b>BN 63</b>                                                                      | 6201 2Z C3 | 6201 2Z C3 | 6201 2RS C3    |
| <b>BN 71</b>                                                                      | 6202 2Z C3 | 6202 2Z C3 | 6202 2RS C3    |
| <b>BN 80</b>                                                                      | 6204 2Z C3 | 6204 2Z C3 | 6204 2RS C3    |
| <b>BN 90</b>                                                                      | 6205 2Z C3 | 6205 2Z C3 | 6305 2RS C3    |
| <b>BN 100</b>                                                                     | 6206 2Z C3 | 6206 2Z C3 | 6206 2RS C3    |
| <b>BN 112</b>                                                                     | 6306 2Z C3 | 6306 2Z C3 | 6306 2RS C3    |
| <b>BN 132</b>                                                                     | 6308 2Z C3 | 6308 2Z C3 | 6308 2RS C3    |
| <b>BN 160MR</b>                                                                   | 6309 2Z C3 | 6308 2Z C3 | 6308 2RS C3    |
| <b>BN 160M/L</b>                                                                  | 6309 2Z C3 | 6309 2Z C3 | 6309 2RS C3    |
| <b>BN 180M</b>                                                                    | 6310 2Z C3 | 6309 2Z C3 | 6309 2RS C3    |
| <b>BN 180L</b>                                                                    | 6310 2Z C3 | 6310 2Z C3 | 6310 2RS C3    |
| <b>BN 200L</b>                                                                    | 6312 2Z C3 | 6310 2Z C3 | 6310 2RS C3    |

## M4 CARATTERISTICHE ELETTRICHE

### M4.1 Tensione

I motori ad una velocità sono previsti nell'esecuzione standard per tensione nominale 230 / 400 V  $\Delta/Y$ , 50 Hz, o 400 / 690 V  $\Delta/Y$ , 50 Hz, con tolleranza di tensione  $\pm 10\%$ , in accordo a quanto specificato nella tabella sottostante.

Per tutti i motori BN ed M, la cui configurazione tensione / frequenza non sia contenuta nella tabella sottostante, la tolleranza di tensione è ridotta al  $\pm 5\%$ .

Per il funzionamento ai limiti di tolleranza, la temperatura può superare di 10 K il limite previsto dalla classe di isolamento adottata.

I motori sono idonei per il funzionamento sulla rete di distribuzione europea con tensione in accordo alla pubblicazione IEC 60038.

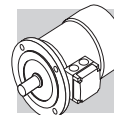
(F 14)

|            |  |  | $V_{mot}$<br>$\pm 10\%$<br>3 ~   | Esecuzione                      |
|------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------|---------------------------------|
| <b>IE1</b> | <b>BN 56 ... BN 132</b>                                                             | <b>M0 ... M4</b>                                                                    | 230 / 400 V - $\Delta/Y$ - 50 Hz | Standard                        |
|            |                                                                                     |                                                                                     | 400 / 690 V - $\Delta/Y$ - 50 Hz | a richiesta, senza sovrapprezzo |
|            |                                                                                     |                                                                                     | 460 V Y - 60 Hz                  | Standard                        |
|            | <b>BN 160 ... 200</b>                                                               | <b>M5</b>                                                                           | 400 / 690 V - $\Delta/Y$ - 50 Hz | Standard                        |
|            |                                                                                     |                                                                                     | 460 V $\Delta$ - 60 Hz           | Standard                        |

<sup>1</sup> solo motori a 4 poli

I motori a due velocità a 50Hz, sono previsti per tensione nominale standard 400V; tolleranze applicabili secondo CEI EN 60034-1.

Nella tabella seguente sono indicati i vari tipi di collegamenti previsti per i motori in funzione della polarità.



(F 15)

| Poli |  | Collegamento avvolgimento  |
|------|-----------------------------------------------------------------------------------|----------------------------|
| 2    | BN 63 ... BN 200                                                                  | $\Delta / Y^{(2)}$         |
| 4    | BN 56 ... BN 200                                                                  |                            |
| 6    | BN 63 ... BN 200                                                                  |                            |
| 8    | BN 71 ... BN 132                                                                  |                            |
| 2/4  | BN 63 ... BN 132                                                                  | $\Delta / YY$ (Dahlander)  |
| 2/6  | BN 71 ... BN 132                                                                  | $Y / Y$ (due avvolgimenti) |
| 2/8  | BN 71 ... BN 132                                                                  |                            |
| 2/12 | BN 80 ... BN 132                                                                  |                            |
| 4/6  | BN 71 ... BN 132                                                                  |                            |
| 4/8  | BN 80 ... BN 132                                                                  | $\Delta / YY$ (Dahlander)  |

(<sup>2</sup>) I motori a doppio voltaggio (es. 230/460 - 60) saranno dotati di una morsettiera a 9 poli con connessione dell'avvolgimento  $\Delta \Delta / \Delta$  o  $YY / Y$  (eccetto 6 poli BN 63  $\Delta / Y$ )

## M4.2 Frequenza

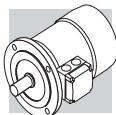
La potenza di targa dei motori BN / M a 60 Hz corrisponde a quanto riportato nella tabella seguente.

(F 16)

|  |  | P <sub>n</sub> [kW] |      |      |        |  |  | P <sub>n</sub> [kW] |      |      |        |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------|------|------|--------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------|------|------|--------|
|                                                                                    |                                                                                    | 2P                  | 4P   | 6P   | 8P (*) |                                                                                    |                                                                                      | 2P                  | 4P   | 6P   | 8P (*) |
| BN 56A                                                                             | —                                                                                  | —                   | 0.07 | —    | —      | BN 100L                                                                            | M3LA                                                                                 | 3.5                 | —    | —    | —      |
| BN 56B                                                                             | M0B                                                                                | —                   | 0.1  | —    | —      | BN 100LA                                                                           | M3LA                                                                                 | —                   | 2.5  | 1.8  | 0.9    |
|                                                                                    |                                                                                    |                     |      |      |        | BN 100LB                                                                           | M3LB                                                                                 | 4.7                 | 3.5  | 2.2  | 1.3    |
| BN 63A                                                                             | M05A                                                                               | 0.21                | 0.14 | 0.1  | —      | BN 112M                                                                            | —                                                                                    | 4.7                 | 4.7  | 2.5  | 1.8    |
| BN 63B                                                                             | M05B                                                                               | 0.3                 | 0.21 | 0.14 | —      | —                                                                                  | M3LC                                                                                 | —                   | 4.7  | 2.5  | —      |
| BN 63C                                                                             | M05C                                                                               | 0.45                | 0.3  | —    | —      | BN 132S                                                                            | M4SA                                                                                 | —                   | 6.5  | 3.5  | 2.5    |
| BN 71A                                                                             | —                                                                                  | 0.45                | 0.3  | 0.21 | 0.1    | BN 132SA                                                                           | —                                                                                    | 6.5                 | —    | —    | —      |
| —                                                                                  | M1SC                                                                               | —                   | —    | 0.21 | —      | BN 132SB                                                                           | M4SB                                                                                 | 8.7                 | —    | —    | —      |
| BN 71B                                                                             | M05SD                                                                              | 0.65                | 0.45 | 0.3  | 0.14   | BN 132M                                                                            | M4LA                                                                                 | 11                  | —    | —    | 3.5    |
| BN 71C                                                                             | M1LA                                                                               | 0.9                 | 0.65 | 0.45 | —      | BN 132MA                                                                           | —                                                                                    | —                   | 8.7  | 4.7  | —      |
|                                                                                    |                                                                                    |                     |      |      |        | BN 132MB                                                                           | M4LB                                                                                 | —                   | 11   | 6.5  | —      |
| BN 80A                                                                             | —                                                                                  | 0.9                 | 0.65 | 0.45 | 0.21   | BN 160MR                                                                           | M4LC                                                                                 | 12.5                | 12.5 | —    | —      |
| BN 80B                                                                             | M2SA                                                                               | 1.3                 | 0.9  | 0.65 | 0.30   | BN 160M                                                                            | M5SA                                                                                 | —                   | —    | 8.7  | —      |
| BN 80C                                                                             | M2SB                                                                               | 1.8                 | 1.3  | 0.9  | —      | BN 160MB                                                                           | —                                                                                    | 17.5                | —    | —    | —      |
| BN 90S                                                                             | —                                                                                  | —                   | 1.3  | 0.9  | 0.45   | —                                                                                  | M5SB                                                                                 | 17.5                | 17.5 | —    | —      |
| BN 90SA                                                                            | —                                                                                  | 1.8                 | —    | —    | —      | BN 160L                                                                            | —                                                                                    | 21.5                | 17.5 | 12.5 | —      |
| BN 90SB                                                                            | —                                                                                  | 2.2                 | —    | —    | —      | —                                                                                  | M5SC                                                                                 | 21.5                | —    | —    | —      |
| BN 90L                                                                             | M3SA                                                                               | 2.5                 | —    | 1.3  | 0.65   | BN 180M                                                                            | M5LA                                                                                 | 24.5                | 21.5 | —    | —      |
| BN 90LA                                                                            |                                                                                    | —                   | 1.8  | —    | —      | BN 180L                                                                            | —                                                                                    | —                   | 25.3 | 17.5 | —      |
| BN 90LB                                                                            |                                                                                    | —                   | 2.2  | —    | —      | BN 200L                                                                            | —                                                                                    | —                   | 34   | —    | —      |
|                                                                                    |                                                                                    |                     |      |      |        | BN 200LA                                                                           | —                                                                                    | 34                  | —    | 22   | —      |

(\*) Motori M\_ esclusi.

Motori BN / M a doppia polarità alimentati a 60 Hz avranno un aumento della potenza nominale, riferita a 50 Hz, pari al 15%. Qualora sulla targhetta di un motore destinato ad essere alimentato a 60 Hz sia richiesto un valore di potenza nominale pari a quello normalizzato a 50 Hz, specificare in designazione l'opzione PN. I motori normalmente avvolti per frequenza 50 Hz possono essere usati in reti a 60 Hz, ma i relativi dati dovranno essere corretti secondo la seguente tabella.



Ad esclusione di esecuzioni CUS e autofrenanti, i motori configurati a 50 Hz riportano in targhetta anche i corrispondenti valori a 60 Hz (vedere tabella sottostante).

(F 17)

| 50 Hz       | 60 Hz       |                        |                                                         |                                |
|-------------|-------------|------------------------|---------------------------------------------------------|--------------------------------|
| V - 50 Hz   | V - 60 Hz   | P <sub>n</sub> - 60 Hz | M <sub>n</sub> , M <sub>a</sub> /M <sub>n</sub> - 60 Hz | n [min <sup>-1</sup> ] - 60 Hz |
| 230/400 Δ/Y | 220 - 240 Δ | 1                      | 0.83                                                    | 1.2                            |
|             | 380 - 415 Y |                        |                                                         |                                |
| 400/690 Δ/Y | 380 - 415 Δ |                        |                                                         |                                |
| 230/400 Δ/Y | 265 - 280 Δ | 1.15                   | 1                                                       | 1.2                            |
|             | 440 - 480 Y |                        |                                                         |                                |
| 400/690 Δ/Y | 440 - 480 Δ |                        |                                                         |                                |

### M4.3 Temperatura ambiente

Le tabelle dei dati tecnici del catalogo riportano le caratteristiche funzionali a 50 Hz in condizioni ambientali standard secondo le Norme CEI EN 60034-1 (temperatura 40 °C e altitudine <1000 m s.l.m.). I motori possono essere impiegati a temperature comprese tra 40 °C e 60 °C applicando i declassamenti di potenza indicati nelle tabelle seguenti.

(F 18)

| Temperatura ambiente (°C)                       | 40°  | 45° | 50° | 55° | 60° |
|-------------------------------------------------|------|-----|-----|-----|-----|
| Potenza ammissibile in % della potenza nominale | 100% | 95% | 90% | 85% | 80% |

Quando è richiesto un declassamento del motore superiore al 15%, contattare il ns. Servizio Tecnico.

### M4.4 Classe d'isolamento

**CL F**

I motori di produzione Bonfiglioli impiegano, di serie, materiali isolanti (filo smaltato, isolanti, resine d'impregnazione) in classe **F**.

**CL H**

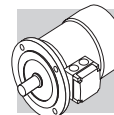
Su richiesta può venire specificata la classe di isolamento **H**.

In genere, per i motori in esecuzione standard la sovratemperatura dell'avvolgimento statore è contenuta entro il limite di 80 K, corrispondente alla sovratemperatura di classe B.

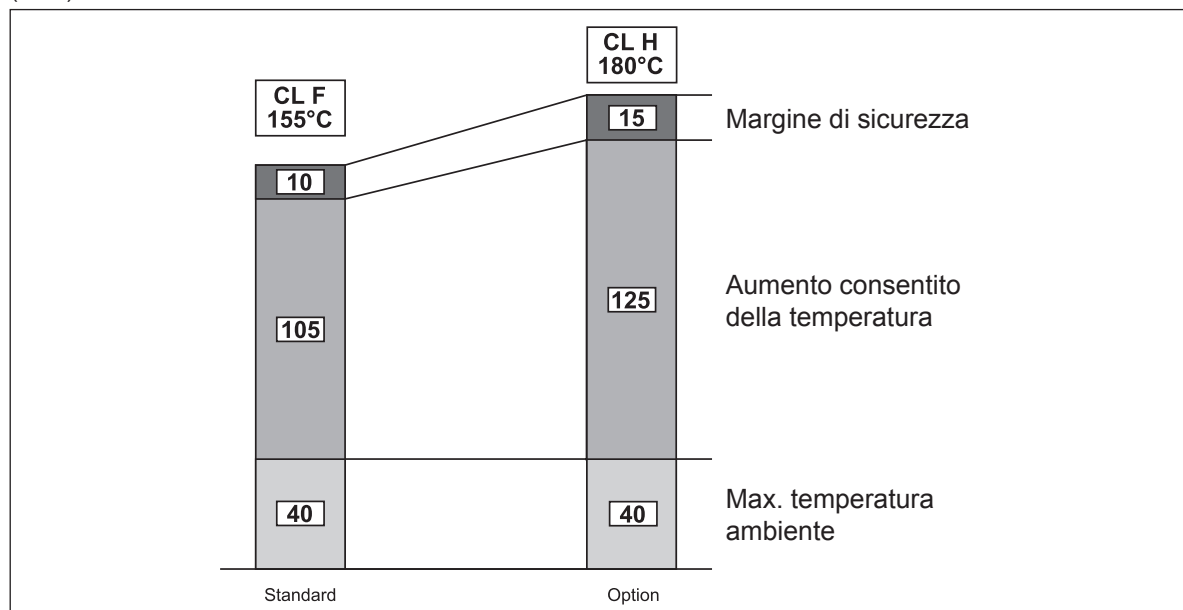
L'accurata scelta dei componenti del sistema isolante consente l'impiego dei motori anche in climi tropicali ed in presenza di vibrazioni normali.

Per applicazioni in presenza di sostanze chimiche aggressive, o di elevata umidità, è consigliabile contattare il Servizio Tecnico Bonfiglioli per la selezione del prodotto più idoneo.

Non disponibile per i motori conformi alle norme CSA e UL (opzione CUS).



(F 19)



#### M4.5 Tipo di servizio

Se non indicato diversamente, la potenza dei motori riportata a catalogo si riferisce al servizio continuo S1. Per i motori utilizzati in condizioni diverse da S1 sarà necessario identificare il tipo di servizio previsto con riferimento alle Norme CEI EN 60034-1. In particolare per servizi S2 ed S3 è possibile ottenere una maggiorazione della potenza rispetto a quella prevista per il servizio continuo secondo quanto indicato nella tabella che segue, valida per i motori a singola polarità.

In alternativa al servizio continuo S1, in fase di configurazione del prodotto è possibile selezionare uno dei seguenti valori: S2, S3 o S9; la targhetta del motore verrà compilata con potenza aumentata coerentemente al tipo di servizio, dati elettrici dedicati e tipo di servizio rispettivamente S2-30min, S3-70% o S9.

Per ulteriori dettagli è necessario contattare il servizio Tecnico Bonfiglioli.

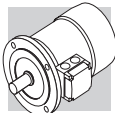
Per le maggiorazioni applicabili a motori a doppia polarità consultare preferibilmente il Servizio Tecnico Bonfiglioli.

(F 20)

|                | Servizio               |        |      |                                 |      |         | Interpellarci |
|----------------|------------------------|--------|------|---------------------------------|------|---------|---------------|
|                | S2                     |        |      | S3 *                            |      |         |               |
|                | Durata del ciclo (min) |        |      | Rapporto di intermittenza ( I ) |      |         |               |
|                | 10                     | 30 (*) | 60   | 25%                             | 40%  | 70% (*) |               |
| f <sub>m</sub> | 1.35                   | 1.15   | 1.05 | 1.25                            | 1.15 | 1.1     |               |

\* La durata del ciclo dovrà comunque essere uguale o inferiore a 10 minuti; se superiore interpellare il nostro Servizio Tecnico.

(\*) Valori predefiniti dalle opzioni di pag. ??



#### M4.5.1 Rapporto di intermittenza:

$$I = \frac{t_f}{t_f + t_r} \cdot 100 \quad (23)$$

$t_f$  = tempo di funzionamento a carico costante

$t_r$  = tempo di riposo

#### M4.5.2 Servizio di durata limitata S2

Caratterizzato da un funzionamento a carico costante per un periodo di tempo limitato, inferiore a quello richiesto per raggiungere l'equilibrio termico, seguito da un periodo di riposo di durata sufficiente a ristabilire, nel motore, la temperatura ambiente.

#### M4.5.3 Servizio intermittente periodico S3:

Caratterizzato da una sequenza di cicli di funzionamento identici, ciascuno comprendente un periodo di funzionamento a carico costante ed un periodo di riposo. In questo servizio, la corrente di avviamento non influenza la sovratemperatura in modo significativo.

#### M4.6 Funzionamento con alimentazione da inverter

I motori elettrici della serie BN ed M possono essere utilizzati con alimentazione da inverter PWM, e tensione nominale all'ingresso del convertitore fino a 500 V.

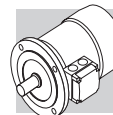
Il sistema isolante sui motori di serie prevede l'isolamento di fase con separatori, l'utilizzo di filo smaltato in grado 2 e resine d'impregnazione in classe H (limite di tenuta all'impulso di tensione 1600V picco-picco e fronte di salita  $t_s > 0.1\mu s$  ai morsetti motore).

Le caratteristiche tipiche coppia/velocità in servizio S1 per motore con frequenza base  $f_b = 50$  Hz sono riportate nella tabella seguente.

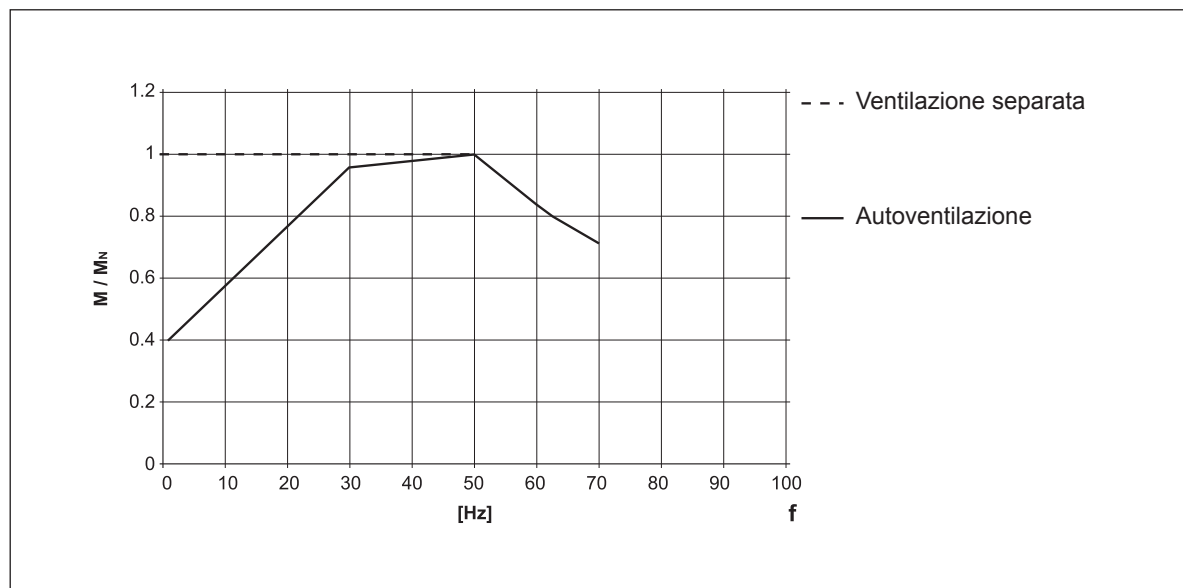
Per frequenze di funzionamento inferiori a circa 30 Hz, a causa della diminuzione della ventilazione, i motori standard autoventilati (IC411) devono essere opportunamente declassati in coppia o, in alternativa, devono essere provvisti di servoventilatore indipendente.

Per frequenze maggiori alla frequenza base, raggiunto il valore massimo di tensione di uscita dell'inverter, il motore lavora in un campo di funzionamento a potenza costante, con coppia all'albero che si riduce ca. con il rapporto  $(f/f_b)$ .

Poiché la coppia massima del motore decresce ca. con  $(f/f_b)^2$ , il margine di sovraccarico ammesso dovrà essere progressivamente ridotto.



(F 21)



Per funzionamento oltre la frequenza nominale, la velocità limite meccanica dei motori è riportata nella seguente tabella:

(F 22)

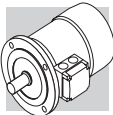
|  |  | n [min <sup>-1</sup> ] |      |      |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------|------|------|
|                                                                                     |                                                                                     | 2p                     | 4p   | 6p   |
| ≤ BN 112                                                                            | M05...M3                                                                            | 5200                   | 4000 | 3000 |
| ≥ BN 132                                                                            | M4, M5                                                                              | 4500                   | 4000 | 3000 |

A velocità superiori alla nominale i motori presentano maggiori vibrazioni meccaniche e rumorosità di ventilazione; è consigliabile, per queste applicazioni, un bilanciamento del rotore in grado B e l'eventuale montaggio del servomotori indipendente.

Il servomotori e, se presente, il freno elettromagnetico devono sempre essere alimentati direttamente da rete.

#### M4.7 Frequenza massima di avviamento Z

Nelle tabelle dei dati tecnici motori è indicata la max frequenza di inserzione a vuoto  $Z_0$  con  $I = 50\%$  riferita alla versione autofrenante. Questo valore definisce il numero max di avviamenti orari a vuoto che il motore può sopportare senza superare la max temperatura ammessa dalla classe di isolamento F. Nel caso pratico di motore accoppiato ad un carico esterno con potenza assorbita  $P_r$ , massa inerziale  $J_c$  e coppia resistente media durante l'avviamento  $M_L$ , il numero di avviamenti ammissibile si può calcolare in modo approssimato con la seguente formula:



$$Z = \frac{Z_0 \cdot K_c \cdot K_d}{K_J} \quad (24)$$

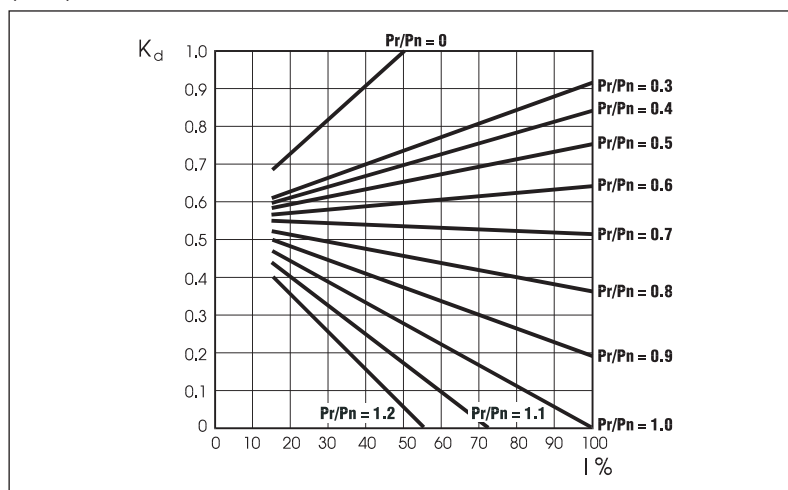
dove:

$$K_J = \frac{J_m + J_c}{J_m} \quad \text{fattore di inerzia}$$

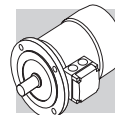
$$K_c = \frac{M_a - M_L}{M_a} \quad \text{fattore di coppia}$$

$$K_d = \quad \text{fattore di carico vedi tabella seguente}$$

(F 23)



Con il numero di avviamenti così ottenuto si dovrà in seguito verificare che il massimo lavoro di frenatura sia compatibile con la capacità termica del freno  $W_{max}$  indicata nelle tabelle (F30), (F38).



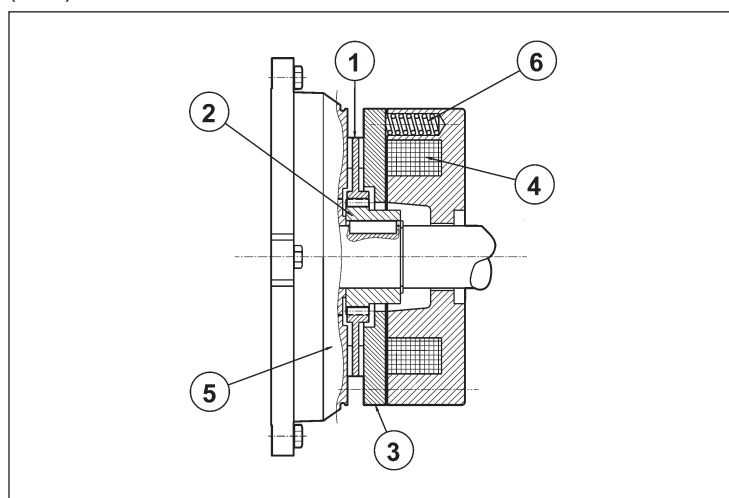
## M5 MOTORI ASINCRONI AUTOFRENANTI

### M5.1 Funzionamento

L'esecuzione autofrenante prevede l'impiego di freni a pressione di molle alimentati in c.c. (tipo FD) o in c.a. (tipo FA).

Tutti i freni funzionano secondo il principio di sicurezza, ossia intervengono in seguito alla pressione esercitata dalle molle, in mancanza di alimentazione.

(F 24)



Legenda:

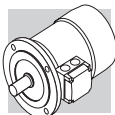
- ① disco
- ② mozzo
- ③ ancora mobile
- ④ bobina
- ⑤ scudo posteriore motore
- ⑥ molle

In mancanza di tensione, l'ancora mobile spinta dalle molle di pressione blocca il disco freno tra la superficie dell'ancora stessa e lo scudo motore impedendo la rotazione dell'albero.

Quando la bobina viene eccitata, l'attrazione magnetica esercitata sull'ancora mobile vince la reazione elastica delle molle e libera il disco freno, e conseguentemente l'albero motore con esso solidale.

### M5.2 Caratteristiche generali

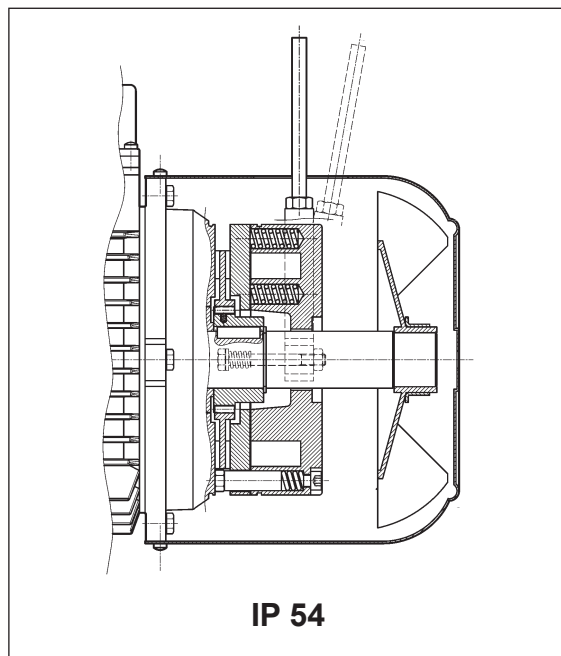
- Coppie frenanti elevate (generalmente  $M_b \approx 2 M_n$ ) e regolabili.
- Disco freno con anima in acciaio a doppia guarnizione d'attrito (materiale a bassa usura, senza amianto).
- Cava esagonale sull'albero motore, lato ventola (NDE), per rotazione manuale (non prevista quando sono presenti le opzioni PS, RC, TC, U1, U2, EN1, EN2, EN3, EN4, EN5, EN6).
- Sblocco meccanico manuale (opzioni **R** e **RM** per BN/M\_FD; opzione **R** per BN/M\_FA).
- Trattamento anticorrosivo di tutte le superfici del freno.
- Isolamento in classe F.



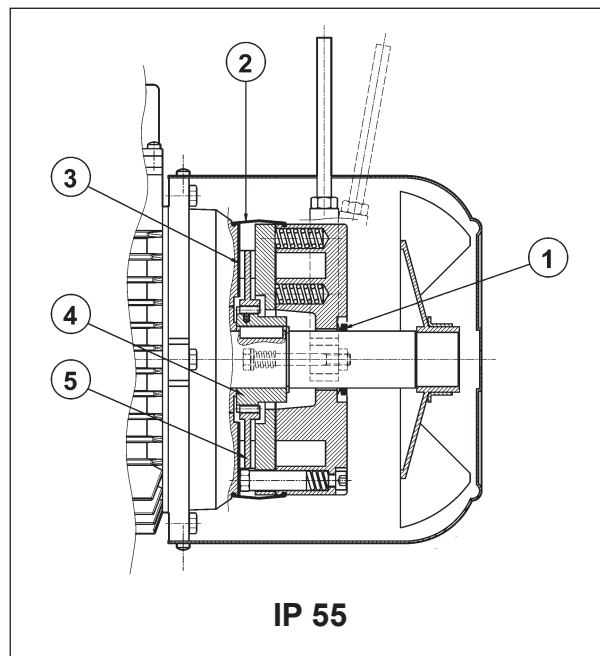
## M6 MOTORI AUTOFRENANTI IN C.C., TIPO BN\_FD e M\_FD

**Grandezze:** BN 63 ... BN 200L / M05 ... M5

(F 25)



(F 26)



Freno elettromagnetico con bobina toroidale in **corrente continua** fissato con viti allo scudo motore; le molle di precarico realizzano il posizionamento assiale del corpo magnete.

Il disco freno è scorrevole sul mozzo trascinatore in acciaio calettato sull'albero e previsto di dispositivo antivibrazione.

I motori sono forniti con freno tarato in fabbrica al valore di coppia riportato nelle tabelle dati tecnici; la coppia frenante può essere regolata modificando il tipo e/o il numero delle molle.

A richiesta, i motori possono essere previsti di leva per lo sblocco manuale con ritorno automatico (**R**) o con mantenimento della posizione di rilascio freno (**RM**); per la posizione angolare della leva di sblocco vedi descrizione della relativa variante al paragrafo "SISTEMI DI SBLOCCO FRENO".

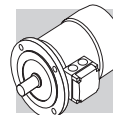
Il freno FD garantisce elevate prestazioni dinamiche e bassa rumorosità; le caratteristiche d'intervento del freno in corrente continua possono essere ottimizzate in funzione dell'applicazione, utilizzando i vari tipi di alimentatore disponibili e/o realizzando l'opportuno cablaggio.

**Per applicazioni che prevedono sollevamenti e/o elevati valori di lavoro orario smaltibile, contattare il servizio tecnico commerciale.**

### M6.1 Grado di protezione

L'esecuzione standard prevede il grado di protezione IP54. In opzione il motore autofrenante tipo FD viene fornito con grado di protezione **IP55**, prevedendo le seguenti varianti costruttive:

- ① anello V-ring posizionato sull'albero motore N.D.E.
- ② fascia di protezione in gomma
- ③ anello in acciaio inox interposto tra scudo motore e disco freno
- ④ mozzo trascinatore in acciaio inox
- ⑤ disco freno in acciaio inox

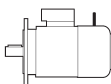


## M6.2 Alimentazione freno FD

L'alimentazione della bobina freno in c.c. è prevista per mezzo di opportuno raddrizzatore montato all'interno della scatola coprimorsetti e già cablato alla bobina del freno. Per motori a singola polarità è inoltre previsto di serie il collegamento del raddrizzatore alla morsetteria motore.

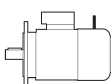
Indipendentemente dalla frequenza di rete, la tensione standard di alimentazione del raddrizzatore  $V_B$  ha il valore indicato nella tabella qui di seguito:

(F 27)

| 2, 4, 6 P                                                                         |                                                                                   |                                |                            | 1 speed                            |                                 |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------|----------------------------|------------------------------------|---------------------------------|
|  |  | BN_FD / M_FD                   |                            | alimentazione freno da morsetteria | alimentazione separata          |
|                                                                                   |                                                                                   | $V_{mot}$<br>$\pm 10\%$<br>3 ~ | $V_B$<br>$\pm 10\%$<br>1 ~ |                                    |                                 |
| BN 63...BN 132                                                                    | M05...M4LB                                                                        | 230/400 V – 50 Hz              | 230 V                      | standard                           | specificare $V_B$ SA o $V_B$ SD |
| BN 160...BN 200                                                                   | M4LC...M5                                                                         | 400/690 V – 50 Hz              | 400 V                      | standard                           | specificare $V_B$ SA o $V_B$ SD |

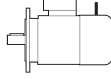
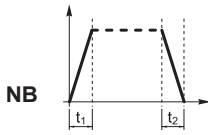
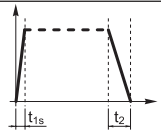
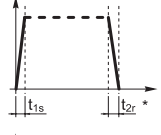
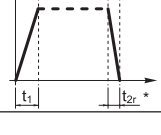
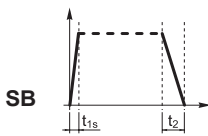
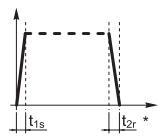
Per i motori a doppia polarità l'alimentazione standard del freno è da linea separata con tensione d'ingresso al raddrizzatore  $V_B$  come indicato nella tabella qui di seguito:

(F 28)

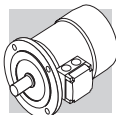
| 2/4, 2/6, 2/8, 2/12, 4/6, 4/8 P                                                    |                                                                                    |                                |                            | 2 speed                                                                               |                                 |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------|----------------------------|---------------------------------------------------------------------------------------|---------------------------------|
|  |  | BN_FD / M_FD                   |                            | alimentazione freno da morsetteria                                                    | alimentazione separata          |
|                                                                                    |                                                                                    | $V_{mot}$<br>$\pm 10\%$<br>3 ~ | $V_B$<br>$\pm 10\%$<br>1 ~ |                                                                                       |                                 |
| BN 63...BN 132                                                                     | M05...M4LB                                                                         | 400 V – 50 Hz                  | 230 V                      |  | specificare $V_B$ SA o $V_B$ SD |

Il raddrizzatore è del tipo a diodi a semionda ( $V_{c.c} \approx 0,45 \times V_{c.a.}$ ) ed è disponibile nelle versioni **NB**, **SB**, **NBR** e **SBR**, come dettagliato nella tabella seguente:

(F 29)

|  |  | freno                   | <div>  </div> |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                                                                     |                                                                                     |                         | standard                                                                                           | a richiesta                                                                           |
| BN 63                                                                               | M05                                                                                 | FD 02                   |                |  |
| BN 71                                                                               | M1                                                                                  | FD 03<br>FD 53          |                                                                                                    |  |
| BN 80                                                                               | M2                                                                                  | FD 04                   |                                                                                                    |  |
| BN 90S                                                                              | —                                                                                   | FD 14                   |                                                                                                    |                                                                                       |
| BN 90L                                                                              | —                                                                                   | FD 05                   |                                                                                                    |                                                                                       |
| BN 100                                                                              | M3                                                                                  | FD 15                   |                                                                                                    |                                                                                       |
| —                                                                                   | —                                                                                   | FD 55                   |                |  |
| BN 112                                                                              | —                                                                                   | FD 06S                  |                                                                                                    |                                                                                       |
| BN 132 - BN 160MR                                                                   | M4                                                                                  | FD 56<br>FD 06<br>FD 07 |                                                                                                    |                                                                                       |
| BN 160L - BN 180M                                                                   | M5                                                                                  | FD 08                   |                                                                                                    |                                                                                       |
| BN 180L - BN 200M                                                                   | —                                                                                   | FD 09                   |                                                                                                    |                                                                                       |

(\*)  $t_{2c} < t_{2r} < t_2$



Il raddrizzatore **SB** a controllo elettronico dell'eccitazione, riduce i tempi di sblocco del freno sovrecitando l'elettromagnete nei primi istanti d'inserzione, per passare poi al normale funzionamento a semionda a distacco del freno avvenuto.

L'impiego del raddrizzatore tipo **SB** è sempre da prevedere nei casi di:

- elevato numero di interventi orari
- tempi di sblocco freno ridotti
- elevate sollecitazioni termiche del freno

Per applicazioni dove è richiesto un rapido intervento (ripristino della condizione frenante) del freno sono disponibili a richiesta i raddrizzatori **NBR** o **SBR**.

Questi raddrizzatori completano i tipi **NB** e **SB**, integrando nel circuito elettronico un interruttore statico che interviene diseccitando rapidamente il freno in caso di mancanza di tensione.

Questa soluzione consente di ridurre i tempi di rilascio del freno evitando ulteriori cablaggi e contatti esterni.

Per il migliore utilizzo dei raddrizzatori **NBR** e **SBR** è richiesta l'alimentazione separata del freno.

**Tensioni disponibili: 230Vac  $\pm 10\%$ , 400Vac  $\pm 10\%$ , 50/60 Hz (con alimentatore); 100Vdc  $\pm 10\%$ , 180Vdc  $\pm 10\%$  (con opzione SD).**

### M6.3 Dati tecnici freni FD

Nella tabella sottostante sono riportati i dati tecnici dei freni in c.c. tipo FD.

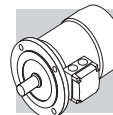
(F 30)

| Freno  | Coppia frenante $M_b$ [Nm] |     |      | Rilascio      |                  | Frenatura     |                  | $W_{max}$ per frenata |         |          | W    | P   |
|--------|----------------------------|-----|------|---------------|------------------|---------------|------------------|-----------------------|---------|----------|------|-----|
|        | molle                      |     |      | $t_1$<br>[ms] | $t_{1s}$<br>[ms] | $t_2$<br>[ms] | $t_{2c}$<br>[ms] | [ J ]                 |         |          |      |     |
|        | 6                          | 4   | 2    |               |                  |               |                  | 10 s/h                | 100 s/h | 1000 s/h | [MJ] | [W] |
| FD02   | —                          | 3.5 | 1.75 | 30            | 15               | 80            | 9                | 4500                  | 1400    | 180      | 15   | 17  |
| FD03   | 5                          | 3.5 | 1.75 | 50            | 20               | 100           | 12               | 7000                  | 1900    | 230      | 25   | 24  |
| FD53   | 7.5                        | 5   | 2.5  | 60            | 30               | 100           | 12               |                       |         |          |      |     |
| FD04   | 15                         | 10  | 5    | 80            | 35               | 140           | 15               | 10000                 | 3100    | 350      | 30   | 33  |
| FD14   |                            |     |      |               |                  |               |                  |                       |         |          |      |     |
| FD05   | 40                         | 26  | 13   | 130           | 65               | 170           | 20               | 18000                 | 4500    | 500      | 50   | 45  |
| FD15   | 40                         | 26  | 13   | 130           | 65               | 170           | 20               |                       |         |          |      |     |
| FD55   | 55                         | 37  | 18   | —             | 65               | 170           | 20               |                       |         |          |      |     |
| FD06S  | 60                         | 40  | 20   | —             | 80               | 220           | 25               | 20000                 | 4800    | 550      | 70   | 55  |
| FD56   | —                          | 75  | 37   | —             | 90               | 250           | 20               | 29000                 | 7400    | 800      | 80   | 65  |
| FD06   |                            | 100 | 50   |               | 100              | 250           | 20               |                       |         |          |      |     |
| FD07   | 150                        | 100 | 50   | —             | 120              | 200           | 25               | 40000                 | 9300    | 1000     | 130  | 65  |
| FD08*  | 250                        | 200 | 170  | —             | 140              | 350           | 30               | 60000                 | 14000   | 1500     | 230  | 100 |
| FD09** | 400                        | 300 | 200  | —             | 200              | 450           | 40               | 70000                 | 15000   | 1700     | 230  | 120 |

\* valori di coppia frenante ottenuti con n° 9, 7, 6 molle rispettivamente

\*\* valori di coppia frenante ottenuti con n° 12, 9, 6 molle rispettivamente

- $t_1$  = tempo di rilascio del freno con alimentatore a semionda  
 $t_{1s}$  = tempo di rilascio del freno con alimentatore a controllo elettronico dell'eccitazione  
 $t_2$  = ritardo di frenatura con interruzione lato c.a. e alimentazione separata  
 $t_{2c}$  = ritardo di frenatura con interruzione lato c.a. e c.c. — I valori di  $t_1$ ,  $t_{1s}$ ,  $t_2$ ,  $t_{2c}$  indicati nella tabella sono riferiti al freno tarato alla coppia massima, traferro medio e tensione nominale  
 $W_{max}$  = energia max per frenata  
 $W$  = energia di frenatura tra due regolazioni successive del traferro  
 $P_b$  = potenza assorbita dal freno a 20°C  
 $M_b$  = coppia frenante statica ( $\pm 15\%$ )  
s/h = avviamenti orari



L'usura delle guarnizioni di attrito è funzione delle condizioni operative (temperatura, umidità, velocità di slittamento, pressione specifica); i valori di usura devono pertanto essere considerati come indicativi.

## M6.4 Collegamenti freno FD

I motori standard ad una velocità sono forniti con il collegamento del raddrizzatore alla morsetteria motore già realizzato in fabbrica.

Per motori a 2 velocità, e dove è richiesta l'alimentazione del freno separata, prevedere il collegamento al raddrizzatore in accordo alla tensione freno VB indicata nella targhetta del motore.

**Data la natura induttiva del carico, per il comando del freno e per l'interruzione lato corrente continua devono essere utilizzati contatti con categoria d'impiego AC-3 secondo IEC 60947-4-1.**

Tabella (F31) - Alimentazione freno dai morsetti motore ed interruzione lato a.c.

Tempo di arresto  $t_2$  ritardato e funzione delle costanti di tempo del motore. Da prevedere quando sono richiesti avviamenti/arresti progressivi.

Tabella (F32) - Bobina freno con alimentazione separata ed interruzione lato c.a.

Tempo di arresto normale ed indipendente dal motore.

Si realizzano i tempi di arresto  $t_2$  indicati nella tabella (F30).

Tabella (F33) - Bobina freno con alimentazione dai morsetti motore ed interruzione lato c.a. e c.c.

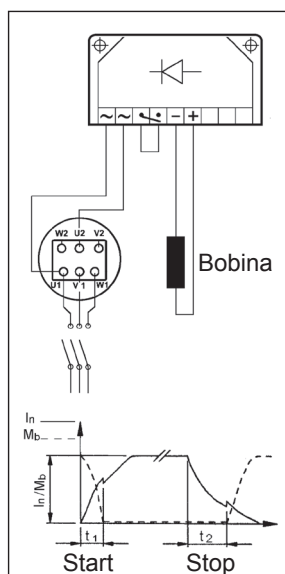
Arresto rapido con i tempi d'intervento  $t_{2c}$  indicati in tabella (F30).

Tabella (F34) - Bobina freno con alimentazione separata ed interruzione lato c.a. e c.c.

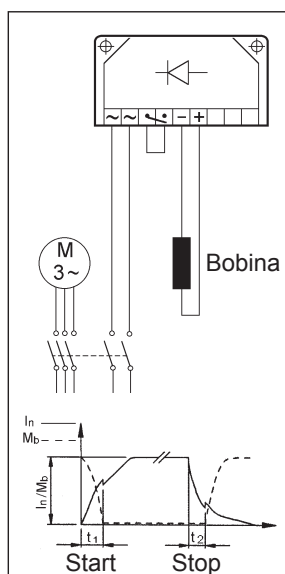
Tempo di arresto ridotto secondo i valori  $t_{2c}$  indicati in tabella (F30).

L'alimentazione del freno direttamente dalla morsetteria del motore (da tab. F31 a tab. F34) è possibile solo quando la tensione nominale del freno corrisponde alla tensione minore del motore.

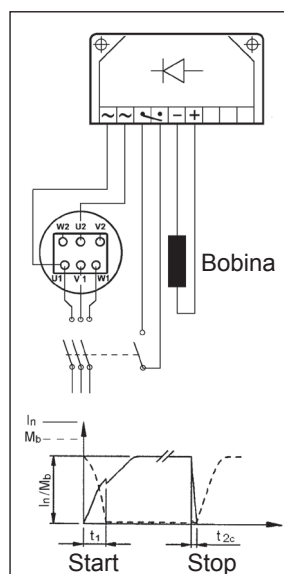
(F 31)



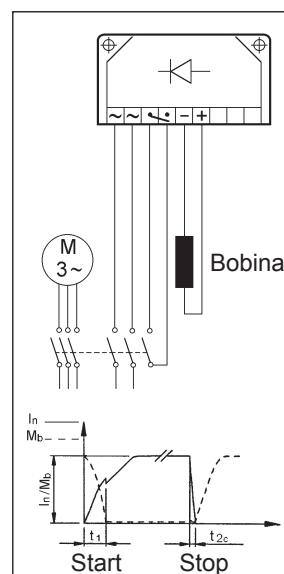
(F 32)

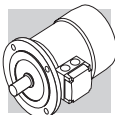


(F 33)



(F 34)

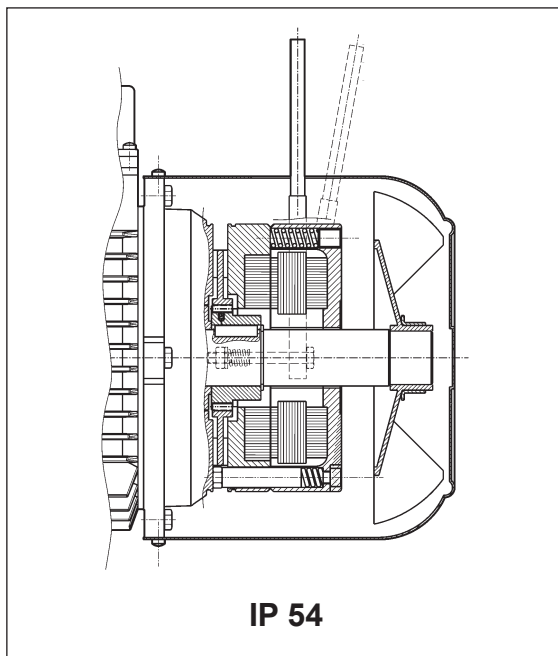




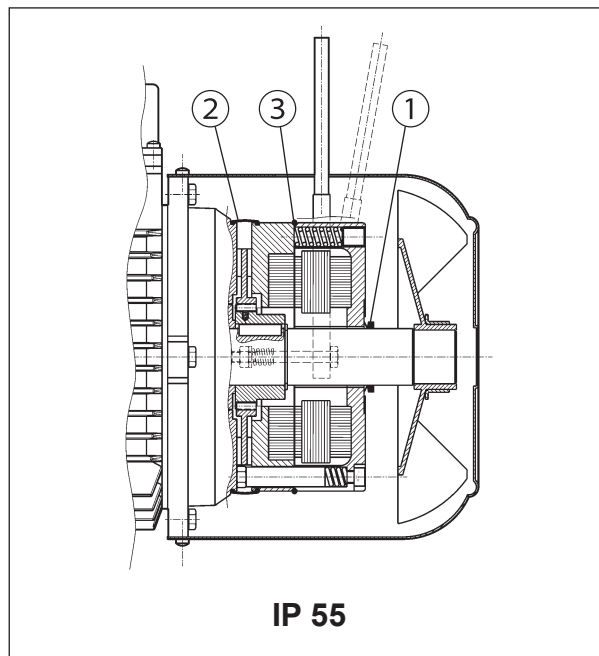
## M7 MOTORI AUTOFRENANTI IN C.A., TIPO BN\_FA e M\_FA

**Grandezze:** BN 63 ... BN 180M / M05 ... M5

(F 35)



(F 36)



Freno elettromagnetico con alimentazione in **corrente alternata** trifase, fissato con viti allo scudo motore; le molle di precarico realizzano il posizionamento assiale del corpo magnete.

Il disco freno è scorrevole assialmente sul mozzo trascinatore in acciaio calettato sull'albero e provvisto di dispositivo antivibrazione.

La coppia frenante è pre-impostata in fabbrica su valori che sono indicati nelle tabelle dati tecnici dei relativi motori.

L'azione del freno è inoltre modulabile, regolando con continuità la coppia frenante, tramite le viti che realizzano il precarico delle molle; il campo di regolazione della coppia è:  $30\% M_{bMAX} < M_b < M_{bMAX}$  ( $M_{bMAX}$  è il momento frenante max riportato in tab. (F38).

Il freno tipo FA presenta dinamiche molto elevate che lo rendono idoneo in applicazioni dove sono richieste frequenze di avviamento elevate con tempi d'intervento molto rapidi.

A richiesta, i motori possono essere previsti di leva per lo sblocco manuale con ritorno automatico (**R**). Per la posizione angolare della leva di sblocco vedi descrizione della relativa variante al paragrafo "SISTEMI DI SBLOCCO FRENO".

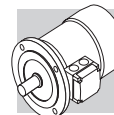
**Per applicazioni che prevedono sollevamenti e/o elevati valori di lavoro orario smaltibile, contattare il servizio tecnico commerciale.**

### M7.1 Grado di protezione

L'esecuzione standard prevede il grado di protezione IP54.

In opzione, il motore autofrenante FA viene fornito con grado di protezione **IP55** prevedendo le seguenti varianti costruttive:

- ① anello V-ring posizionato sull'albero motore N.D.E.
- ② protezione in gomma impermeabile e antipolvere
- ③ anello O-ring



## M7.2 Alimentazione freno FA

Nei motori a singola polarità l'alimentazione della bobina freno è derivata direttamente dalla morsettiera motore e la tensione del freno quindi coincide con la tensione del motore. In questo caso la tensione del freno può essere omessa dalla designazione

Per i motori a doppia polarità, e per i motori con alimentazione separata del freno, è presente una morsettiera ausiliaria con 6 terminali per il collegamento alla linea del freno. In entrambi i casi il valore di tensione del freno dovrà essere specificato in designazione.

Nella tabella seguente sono riportate le condizioni di alimentazione standard del freno in c.a. per i motori a singola e doppia polarità:

(F 37)

| motori a singola polarità | BN 63...BN 132             | BN 160...BN 180           |
|---------------------------|----------------------------|---------------------------|
|                           | M05...M4LB                 | M4LC...M5                 |
|                           | 230Δ / 400Y V ±10% – 50 Hz | 400Δ/ 690Y V ±10% – 50 Hz |
|                           | 265Δ / 460Y ±10% - 60 Hz   | 460Y – 60 Hz              |

| motori a doppia polarità<br>(alimentazione da linea separata) | BN 63...BN 132             |
|---------------------------------------------------------------|----------------------------|
|                                                               | M05...M4                   |
|                                                               | 230Δ / 400Y V ±10% – 50 Hz |
|                                                               | 460Y - 60 Hz               |

Se non diversamente specificato, l'alimentazione standard del freno è 230Δ /400Y V - 50 Hz.

Su richiesta, sono disponibili tensioni speciali, nel campo 24...690 V, 50-60 Hz.

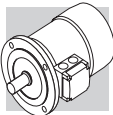
## M7.3 Dati tecnici freni FA

(F 38)

| Freno  | Coppia frenante<br>$M_b$<br>[Nm] | Rilascio<br>$t_1$<br>[ms] | Frenatura<br>$t_2$<br>[ms] | $W_{max}$<br>[ J ] |         |          | W<br>[MJ] | P<br>[VA] |
|--------|----------------------------------|---------------------------|----------------------------|--------------------|---------|----------|-----------|-----------|
|        |                                  |                           |                            | 10 s/h             | 100 s/h | 1000 s/h |           |           |
| FA 02  | 3.5                              | 4                         | 20                         | 4500               | 1400    | 180      | 15        | 60        |
| FA 03  | 7.5                              | 4                         | 40                         | 7000               | 1900    | 230      | 25        | 80        |
| FA 04  | 15                               | 6                         | 60                         | 10000              | 3100    | 350      | 30        | 110       |
| FA 14  |                                  |                           |                            |                    |         |          |           |           |
| FA 05  | 40                               | 8                         | 90                         | 18000              | 4500    | 500      | 50        | 250       |
| FA 15  |                                  |                           |                            |                    |         |          |           |           |
| FA 06S | 60                               | 16                        | 120                        | 20000              | 4800    | 550      | 70        | 470       |
| FA 06  | 75                               | 16                        | 140                        | 29000              | 7400    | 800      | 80        | 550       |
| FA 07  | 150                              | 16                        | 180                        | 40000              | 9300    | 1000     | 130       | 600       |
| FA 08  | 250                              | 20                        | 200                        | 60000              | 14000   | 1500     | 230       | 1200      |

$M_b$  = max coppia frenante statica (±15%)  
 $t_1$  = tempo di rilascio freno  
 $t_2$  = ritardo di frenatura  
 $W_{max}$  = energia max per frenata (capacità termica del freno)  
 $W$  = energia di frenatura tra due regolazioni successive del traferro  
 $P_b$  = potenza assorbita dal freno a 20° (50 Hz)  
s/h = avviamenti orari

N.B.  
I valori di  $t_1$  e  $t_2$  riportati in tabella sono riferiti al freno tarato alla coppia nominale, traferro medio e tensione nominale.

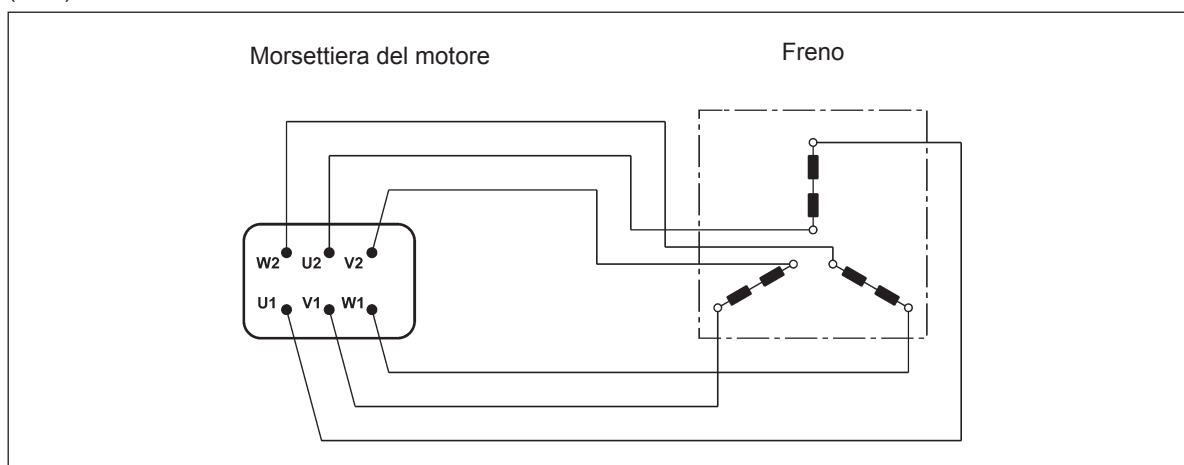


L'usura delle guarnizioni di attrito è funzione delle condizioni operative (temperatura, umidità, velocità di slittamento, pressione specifica); i valori di usura devono pertanto essere considerati come indicativi.

#### M7.4 Collegamenti freno FA

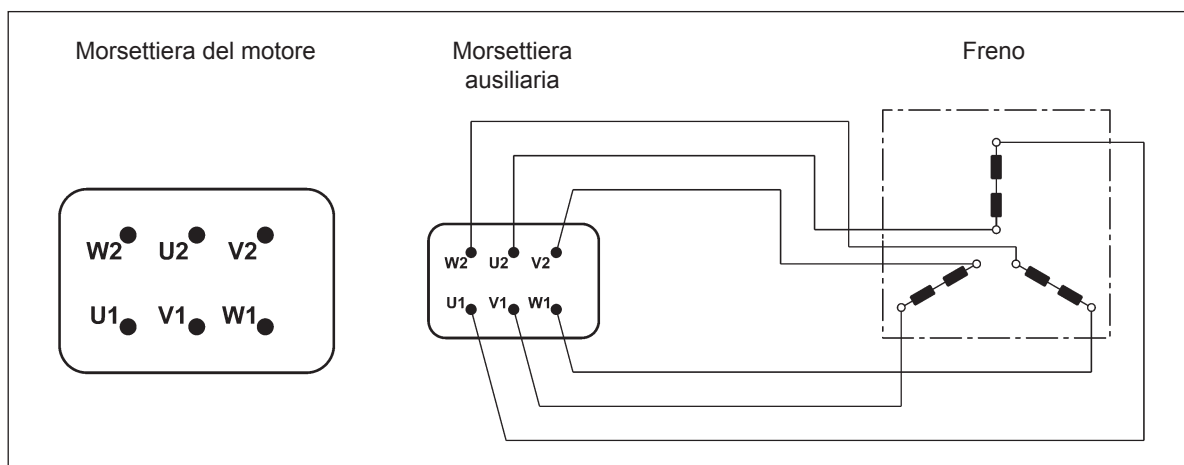
Per i motori con alimentazione del freno derivata direttamente dall'alimentazione motore i collegamenti alla morsettiera corrispondono a quanto riportato nello schema seguente:

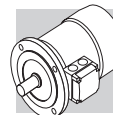
(F 39)



Per i motori a doppia polarità e, quando richiesto, per i motori ad una velocità con alimentazione da linea separata è prevista una morsettiera ausiliaria a 6 morsetti per il collegamento del freno; in questa esecuzione i motori prevedono la scatola coprimorsetti maggiorata. Vedi schema seguente:

(F 40)



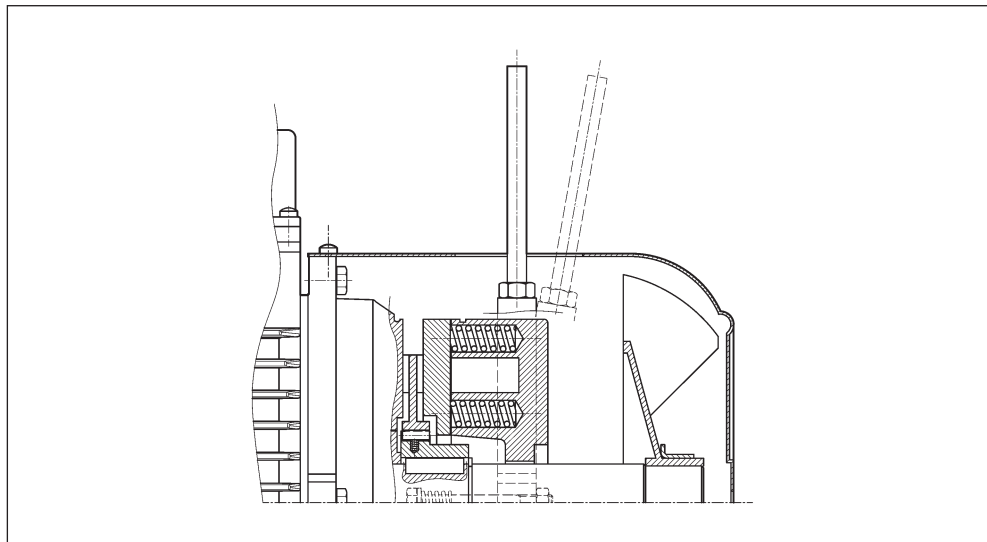


## M8 SISTEMI DI SBLOCCO FRENO

I freni a pressione di molle tipo FD e FA possono essere dotati opzionalmente di dispositivi per lo sblocco manuale del freno, normalmente utilizzati per condurre interventi di manutenzione sulle parti di macchina, o dell'impianto, comandate dal motore.

**R**

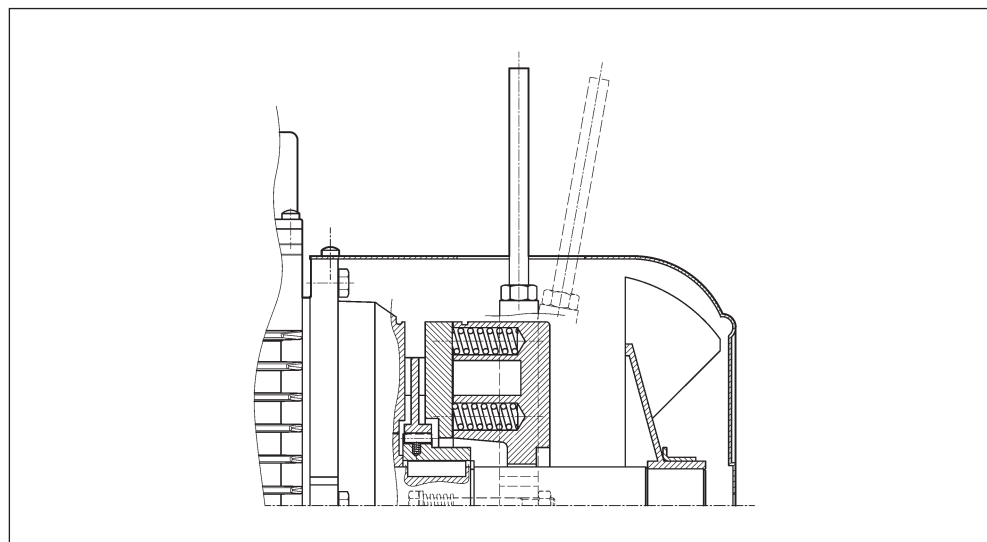
(F 41)



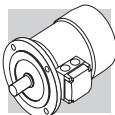
La leva di sblocco è dotata di ritorno automatico, tramite dispositivo a molla.

**RM**

(F 42)



Sui motori tipo BN\_FD la leva di sblocco può essere temporaneamente bloccata in posizione di rilascio del freno, avvitando la stessa fino ad impegnare l'estremità in un risalto del corpo del freno. La disponibilità dei sistemi di sblocco freno è diversa per i vari tipi di motore, ed è descritta dalla tabella seguente:



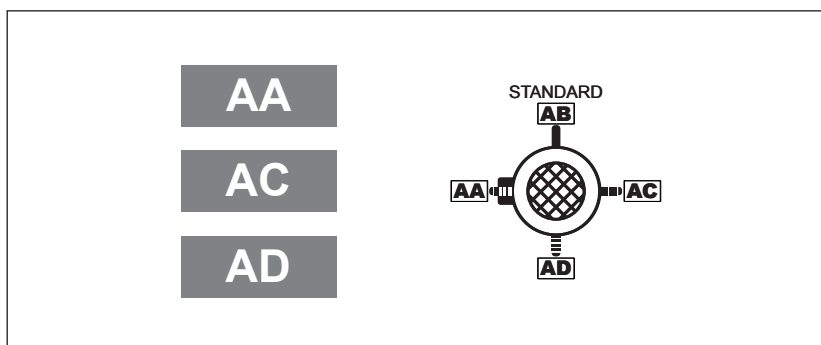
(F 43)

|       | R               | RM                                                                  |
|-------|-----------------|---------------------------------------------------------------------|
| BN_FD | BN 63...BN 200  | 2p 63A2 ≤ H ≤ 132M2<br>4p 63A4 ≤ H ≤ 132MA4<br>6p 63A6 ≤ H ≤ 132MA6 |
| M_FD  | M 05...M 5      | M 05...M 4LA                                                        |
| BN_FA | BN 63...BN 180M |                                                                     |
| M_FA  | M 05...M 5      |                                                                     |

### M8.1 Orientamento della leva di sblocco

Per entrambe le opzioni **R** e **RM**, la leva di sblocco del freno viene collocata, se non diversamente specificato, con orientamento di 90° in senso orario, rispetto alla posizione della morsettiera - riferimento **[AB]** nel disegno sottostante. Orientamenti alternativi, tipo **[AA]**, **[AC]** e **[AD]** possono essere richiesti citandone la relativa specifica:

(F 44)

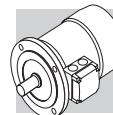


### M8.2 Caratteristiche volani (F1)

La tabella seguente riporta il peso e l'inerzia aggiuntiva del volani che possono essere richiesti tramite l'opzione F1. Le dimensioni complessive rimangono invariate.

(F 45)

| Dati tecnici volano per motori tipo: BN_FD |     |                  |                       |
|--------------------------------------------|-----|------------------|-----------------------|
|                                            |     | Peso volano [Kg] | Inerzia volano [Kgm²] |
| BN 63                                      | M05 | 0.69             | 0.00063               |
| BN 71                                      | M1  | 1.13             | 0.00135               |
| BN 80                                      | M2  | 1.67             | 0.00270               |
| BN 90 S - BN 90 L                          | —   | 2.51             | 0.00530               |
| BN 100                                     | M3  | 3.48             | 0.00840               |
| BN 112                                     | —   | 4.82             | 0.01483               |
| BN 132 S - BN 132 M                        | M4  | 6.19             | 0.02580               |



## M9 OPZIONI

### M9.1 Protezioni termiche

Oltre alla protezione garantita dall'interruttore magnetotermico, i motori possono essere provvisti di sonde termiche incorporate per proteggere l'avvolgimento da eccessivo riscaldamento dovuto a scarsa ventilazione o servizio intermittente.

Questa protezione dovrebbe sempre essere prevista per motori servoventilati (IC416).

### M9.2 Filtro capacitivo

**CF**

Per i soli motori autofrenanti in corrente continua, tipo BN\_FD è disponibile in opzione il filtro capacitivo. Se corredati dell'opportuno filtro capacitivo a monte del raddrizzatore (opzione CF) i motori rientrano nei limiti di emissione previsti dalla Norma EN 61000-6-3:2007 "Compatibilità elettromagnetica – Norma Generica sull'emissione – Parte 6-3: Ambienti residenziali, commerciali e dell'industria leggera".

### M9.3 Sonde termiche a termistori

**E3**

Sono dei semiconduttori che presentano una rapida variazione di resistenza in prossimità della temperatura nominale di intervento (150 °C).

L'andamento della caratteristica  $R = f(T)$  è normalizzato dalle Norme DIN 44081, IEC 34-11.

In genere vengono impiegati termistori a coefficiente di temperatura positivo denominati anche "resistori a conduttore freddo" PTC. I termistori non possono comandare direttamente i relais e devono pertanto essere collegati ad un'adeguata apparecchiatura di sgancio.

Con questa protezione vengono inseriti tre PTC, (collegati in serie), nell'avvolgimento con terminali disponibili in morsettiera ausiliaria.

**K1**

Sono un sottogruppo dei termistori PTC le cui caratteristiche costruttive ne permettono l'impiego come sensori di temperatura aventi un coefficiente di temperatura positivo funzione della resistenza. La temperatura di esercizio è: 0°C ... +260°C.

I termistori non possono comandare direttamente i relais e devono pertanto essere collegati ad un'adeguata apparecchiatura di sgancio.

I terminali (polarizzati) di n.1 KTY 84-130 sono disponibili in una morsettiera ausiliaria.

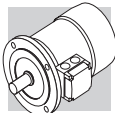
### M9.4 Sonde termiche bimetalliche

**D3**

I protettori di questo tipo contengono all'interno di un involucro un disco bimetallico che, raggiunta la temperatura nominale di intervento (150 °C), commuta i contatti dalla posizione di riposo.

Con la diminuzione della temperatura, il disco e i contatti riprendono automaticamente la posizione di riposo.

Normalmente si impiegano tre sonde bimetalliche in serie con contatti normalmente chiusi e terminali disponibili in una morsettiera ausiliaria.



## M9.5 Motore con connettore

### CON

Sono disponibili tre tipi di connettori (CON 1, CON 2, CON 3) che possono essere installati in due posizioni di montaggio: lato destro scatola coprimorsettiera (C1D, C2D, C3D); lato sinistro scatola coprimorsettiera (C1S, C2S, C3S).

L'opzione CON è prevista per i motori BN e M a singola polarità (2, 4, 6, 8, poli) nelle grandezze indicate nella tabella seguente. Sono escluse tutte le versioni con doppia polarità. I connettori sono disponibili per i motori BN e M nella versione senza freno e per i motori autofrenanti BN e M dotati di freno in corrente continua FD, nelle grandezze indicate nella tabella seguente.

**Sul motore è fissato il connettore maschio (dotato di pin), il connettore femmina è escluso dalla fornitura.**

**Con l'opzione CON è sempre previsto il collegamento a Y delle fasi.**

Per motori provvisti di servoventilazione (opzione U1) l'alimentazione del ventilatore è prevista nella scatola morsettiera separata fissata al copriventola.

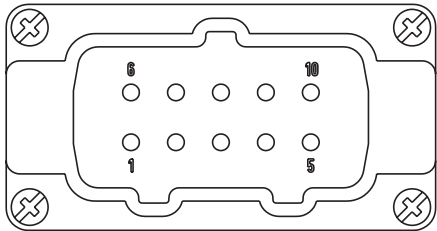
Nei motori dotati di encoder (opzioni EN1...EN6) i terminali della connessione dell'encoder avviene tramite cavo volante non connesso al connettore.

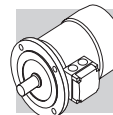
L'opzione CON non è applicabile ai motori dotati di freno in corrente alternata FA.

L'opzione CON non è compatibile con le opzioni U2, CUS, IC.

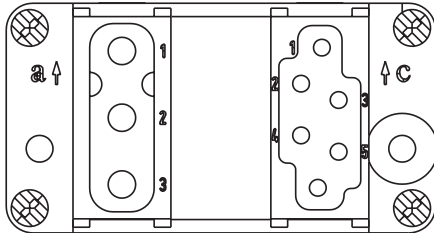
### Dati tecnici

(F 46)

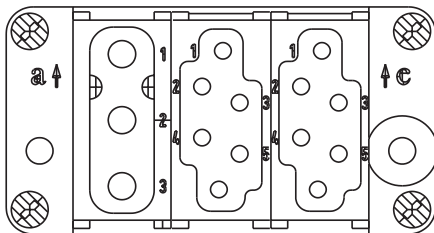
| Opzione                            | CON 1                                                                                |
|------------------------------------|--------------------------------------------------------------------------------------|
| Grandezza motore                   | BN63...BN112 / M05...M3                                                              |
| Vista connettore                   |  |
| Tipo di connettore                 | Harting Han 10ES                                                                     |
| Corpo connettore                   | Han EMC 10B con 2 leve                                                               |
| Numero di pins - corrente nominale | 10 x 16A                                                                             |
| Tensione di alimentazione          | 500 Vac                                                                              |
| Tipo di connessione contatti       | Terminali con vite                                                                   |



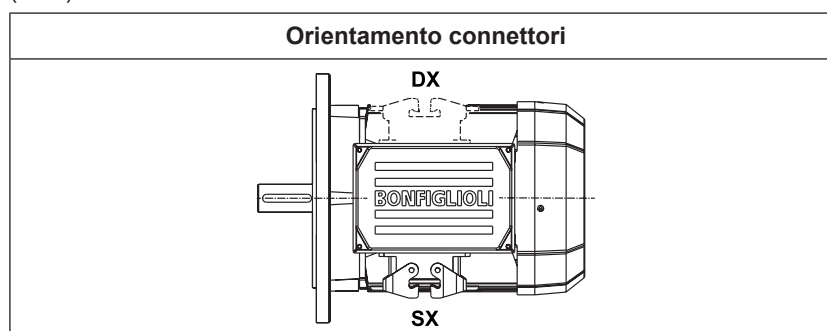
(F 47)

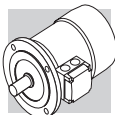
| Opzione                            | CON 2                                                                              |
|------------------------------------|------------------------------------------------------------------------------------|
| Grandezza motore                   | <b>BN63...BN160MR / M05...M4L</b>                                                  |
| Vista connettore                   |  |
| Tipo di connettore                 | Harting Han Modular                                                                |
| Corpo connettore                   | Han EMC 10B con 2 leve                                                             |
| Tipo Moduli                        | Modulo C + Modulo vuoto + Modulo E                                                 |
| Numero di pins - corrente nominale | 3 x 36A / 6 x 16A                                                                  |
| Tensione di alimentazione          | 500 Vac                                                                            |
| Tipo di connessione contatti       | Contatti a crimpare                                                                |

(F 48)

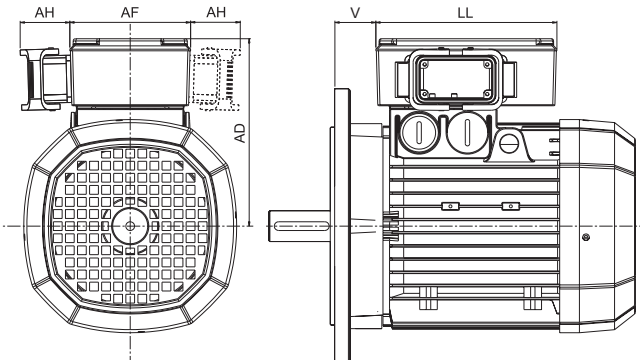
| Opzione                            | CON 3                                                                                |
|------------------------------------|--------------------------------------------------------------------------------------|
| Grandezza motore                   | <b>BN63...BN160M / M05...M4L</b>                                                     |
| Vista connettore                   |  |
| Tipo di connettore                 | Harting Han Modular                                                                  |
| Corpo connettore                   | Han EMC 10B con 2 leve                                                               |
| Tipo Moduli                        | Modulo C + Modulo E + Modulo E                                                       |
| Numero di pins - corrente nominale | 3 x 36A / 6 + 6 x 16A                                                                |
| Tensione di alimentazione          | 500 Vac                                                                              |
| Tipo di connessione contatti       | Contatti a crimpare                                                                  |

(F 49)



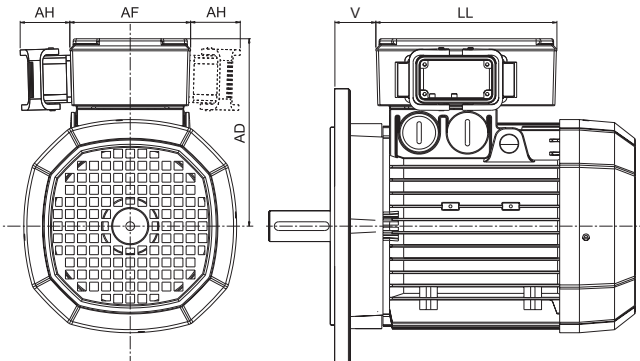


(F 50)

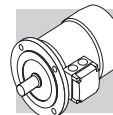
| Dimensioni d'ingombro motori senza freno                                           |                                                                                   |         |         |         |         |                       |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------|---------|---------|---------|-----------------------|
|  |                                                                                   |         |         |         |         |                       |
|   |  | AD (mm) | AF (mm) | AH (mm) | LL (mm) | V <sup>(*)</sup> (mm) |
| <b>BN63</b>                                                                        | <b>M05</b>                                                                        | 136     | 110     | 45      | 165     | 4.5                   |
| <b>BN71</b>                                                                        | <b>M1</b>                                                                         | 149     | 110     | 45      | 165     | 15.5                  |
| <b>BN80</b>                                                                        | <b>M2</b>                                                                         | 160     | 110     | 45      | 165     | 16.5                  |
| <b>BN90</b>                                                                        | —                                                                                 | 162     | 110     | 45      | 165     | 31.5                  |
| <b>BN100</b>                                                                       | <b>M3</b>                                                                         | 171     | 110     | 45      | 165     | 37.5                  |
| <b>BN112</b>                                                                       | —                                                                                 | 186     | 110     | 45      | 165     | 39                    |
| <b>BN132</b>                                                                       | <b>M4</b>                                                                         | 210     | 140     | 45      | 188     | 45.5                  |
| <b>BN160MR</b>                                                                     | —                                                                                 | 210     | 140     | 45      | 188     | 161                   |

(\*) dimensioni riferite ai soli motori BN.

(F 51)

| Dimensioni d'ingombro motori con freno FD                                            |                                                                                     |         |         |         |         |                       |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------|---------|---------|---------|-----------------------|
|  |                                                                                     |         |         |         |         |                       |
|   |  | AD (mm) | AF (mm) | AH (mm) | LL (mm) | V <sup>(*)</sup> (mm) |
| <b>BN63</b>                                                                          | <b>M05</b>                                                                          | 136     | 110     | 45      | 165     | 4.5                   |
| <b>BN71</b>                                                                          | <b>M1</b>                                                                           | 149     | 110     | 45      | 165     | 15.5                  |
| <b>BN80</b>                                                                          | <b>M2</b>                                                                           | 160     | 110     | 45      | 165     | 16.5                  |
| <b>BN90</b>                                                                          | —                                                                                   | 162     | 110     | 45      | 165     | 31.5                  |
| <b>BN100</b>                                                                         | <b>M3</b>                                                                           | 171     | 110     | 45      | 165     | 37.5                  |
| <b>BN112</b>                                                                         | —                                                                                   | 186     | 110     | 45      | 165     | 39                    |
| <b>BN132</b>                                                                         | <b>M4</b>                                                                           | 210     | 140     | 45      | 188     | 45.5                  |
| <b>BN160MR</b>                                                                       | —                                                                                   | 210     | 140     | 45      | 188     | 161                   |

(\*) dimensioni riferite ai soli motori BN.



## M9.6 Controllo della funzionalità del freno

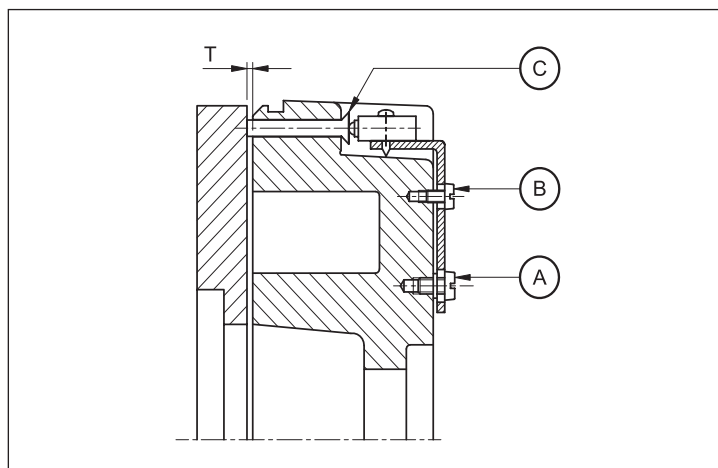
### MSW

Il microinterruttore può essere regolato per segnalare l'attrazione/rilascio dell'ancora mobile o per segnalare il raggiungimento del massimo valore ammissibile per il traferro.

**L'opzione MSW è disponibile per i freni FD03...FD09.**

Il microswitch è dotato di tre terminali NC, NO, COM. Nella figura sottostante sono raffigurati i principali componenti del freno equipaggiato con microswitch.

(F 52)



- A: Viti di fissaggio
- B: Vite di regolazione
- C: Attuatore

## M9.7 Ingresso cavi supplementare per motori autofrenanti

### IC

Sulla scatola coprimorsettiera dei motori autofrenanti BN63...BN160MR / M05...M4 sono disponibili due ingressi cavo supplementari M16 x 1.5 (uno per lato).

Sulla scatola coprimorsettiera dei motori autofrenanti BN160...BN200 / M5 è disponibile un ingresso cavo supplementare M16 x 1.5 affiancato all'ingresso cavo freno.

## M9.8 Riscaldatori anticondensa

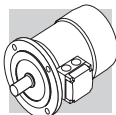
### H1

### NH1

I motori funzionanti in ambienti molto umidi e/o in presenza di forti escursioni termiche, possono essere equipaggiati con una resistenza anti-condensa.

L'alimentazione monofase è prevista da morsettiera ausiliaria posta nella scatola principale.

Le potenze assorbite dalla resistenza elettrica sono elencate qui di seguito:



(F 53)

|  |  | H1                     | NH1                    |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------|------------------------|
|                                                                                   |                                                                                   | 1~ 230V ± 10%<br>P [W] | 1~ 115V ± 10%<br>P [W] |
| BN 56...BN 80                                                                     | M0...M2                                                                           | 10                     | 10                     |
| BN 90...BN 160MR                                                                  | M3 - M4                                                                           | 25                     | 25                     |
| BN 160M...BN 180M                                                                 | M5                                                                                | 50                     | 50                     |
| BN 180L...BN 200L                                                                 | —                                                                                 |                        |                        |

**Importante! Durante il funzionamento del motore la resistenza anticondensa non deve mai essere inserita.**

## M9.9 Tropicalizzazione

**TP**

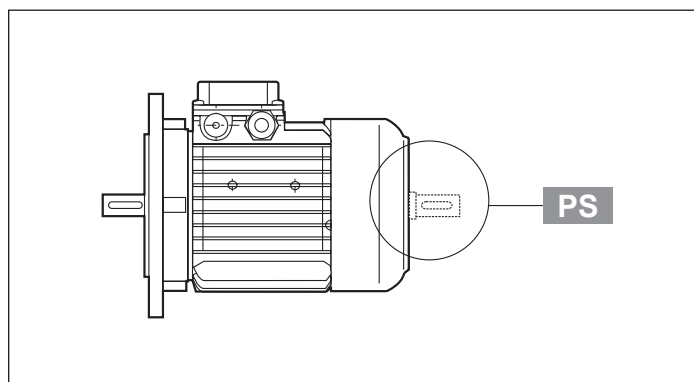
Su richiesta, mediante la specifica dell'opzione **TP**, gli avvolgimenti del motore ottengono una protezione aggiuntiva che li rende idonei al funzionamento in condizioni di elevata temperatura e umidità.

## M9.10 Seconda estremità d'albero

**PS**

L'opzione esclude le varianti RC, TC, U1, U2, EN1, EN2, EN3, EN4, EN5, EN6.  
Le dimensioni sono reperibili nelle tavole dimensionali dei motori.

(F 54)

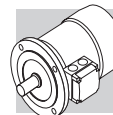


## M9.11 Dispositivo antiritorno

**AL**

**AR**

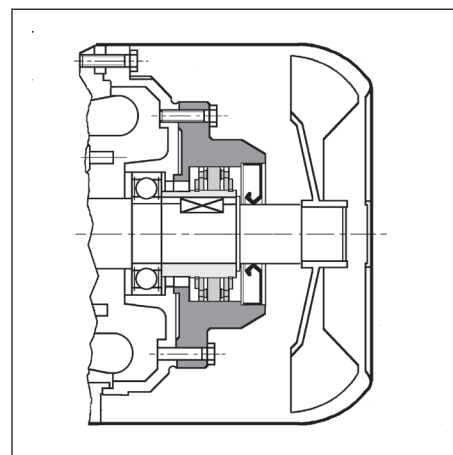
Nelle applicazioni dove è necessario impedire la rotazione inversa del motore dovuta all'azione del carico, è possibile impiegare motori provvisti di un dispositivo antiritorno (disponibile solo sulla serie M). Questo dispositivo, pur consentendo la libera rotazione nel senso di marcia, interviene istantaneamente in caso di mancanza di alimentazione bloccando la rotazione dell'albero nel senso inverso. Il dispositivo antiritorno è lubrificato a vita con grasso specifico per questa applicazione. In fase di ordine dovrà essere indicato chiaramente il senso di marcia previsto. In nessun caso il dispositivo antiritorno dovrà essere utilizzato per impedire la rotazione inversa nel caso di collegamento elettrico errato. Nella tabella (F55) sono indicate le coppie nominale e massima di bloccaggio attribuite ai dispositivi antiritorno utilizzati, mentre la raffigurazione schematica del dispositivo è inserita nella tabella (F56). Le dimensioni sono le stesse del motore autofrenante. Il senso di rotazione libera è descritto nel paragrafo "OPZIONI MOTORI" delle specifiche sezioni dedicate ai riduttori.



(F 55)

|  | Coppia nominale<br>di bloccaggio<br>[Nm] | Coppia max.<br>di bloccaggio<br>[Nm] | Velocità<br>di distacco<br>[min <sup>-1</sup> ] |
|-----------------------------------------------------------------------------------|------------------------------------------|--------------------------------------|-------------------------------------------------|
| <b>M1</b>                                                                         | 6                                        | 10                                   | 750                                             |
| <b>M2</b>                                                                         | 16                                       | 27                                   | 650                                             |
| <b>M3</b>                                                                         | 54                                       | 92                                   | 520                                             |
| <b>M4</b>                                                                         | 110                                      | 205                                  | 430                                             |

(F 56)



## M9.12 Ventilazione

I motori sono raffreddati mediante ventilazione esterna (IC 411 secondo CEI EN 60034-6) e sono provvisti di ventola radiale in plastica, funzionante in entrambi i versi di rotazione.

L'installazione dovrà assicurare una distanza minima della calotta copriventola dalla parete più vicina, in modo da non creare impedimento alla circolazione dell'aria, oltre che permettere l'esecuzione della manutenzione ordinaria del motore e, se presente, del freno.

Su richiesta, a partire dalle grandezze BN 71, oppure M1, i motori possono essere forniti con ventilazione forzata ad alimentazione indipendente. Il raffreddamento è realizzato per mezzo di un ventilatore assiale con alimentazione indipendente, montato sulla calotta copriventola (metodo di raffreddamento IC 416).

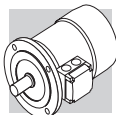
Questa esecuzione è utilizzata in caso di alimentazione del motore tramite inverter allo scopo di estendere il campo di funzionamento a coppia costante anche a bassa velocità, o quando per lo stesso sono richieste elevate frequenze di avviamento.

Da questa opzione sono esclusi tutti i motori con doppia sporgenza d'albero (opzione PS).

(F 57)

| Dati di alimentazione                                                               |                                                                                     |                 |         |             |             |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------|---------|-------------|-------------|
|  |  | V a.c. ± 10%    | Hz      | P [W]       | I [A]       |
| BN 71                                                                               | M1                                                                                  | 1~ 230          | 50 / 60 | 22          | 0.12        |
| BN 80                                                                               | M2                                                                                  |                 |         | 22          | 0.12        |
| BN 90                                                                               | —                                                                                   |                 |         | 40          | 0.30        |
| BN 100 (*)                                                                          | M3                                                                                  |                 |         | 50          | 0.25        |
| BN 112                                                                              | —                                                                                   | 3~ 230 Δ / 400Y |         | 50          | 0.26 / 0.15 |
| BN 132S                                                                             | M4S                                                                                 |                 | 110     | 0.38 / 0.22 |             |
| BN 132M...BN 160MR                                                                  | M4L                                                                                 |                 |         |             |             |
| BN 160...BN 180M                                                                    | M5                                                                                  |                 | 50      | 180         | 1.25 / 0.72 |

Per la variante sono disponibili due esecuzioni alternative, denominate **U1** e **U2**, aventi lo stesso ingombro in senso longitudinale. Per entrambe le esecuzioni, la maggiore lunghezza della calotta copriventola (**ΔL**) è riportata nella tabella che segue. Dimensioni complessive ricavabili dalle tavole dimensionali dei motori.



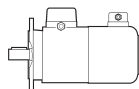
(F 58)

| Tabella maggiorazione lunghezze motore                                            |                                                                                   |              |              |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------|--------------|
|  |  | $\Delta L_1$ | $\Delta L_2$ |
| <b>BN 71</b>                                                                      | <b>M1</b>                                                                         | 93           | 32           |
| <b>BN 80</b>                                                                      | <b>M2</b>                                                                         | 127          | 55           |
| <b>BN 90</b>                                                                      | —                                                                                 | 131          | 48           |
| <b>BN 100</b>                                                                     | <b>M3</b>                                                                         | 119          | 28           |
| <b>BN 112</b>                                                                     | —                                                                                 | 130          | 31           |
| <b>BN 132S</b>                                                                    | <b>M4S</b>                                                                        | 161          | 51           |
| <b>BN 132M</b>                                                                    | <b>M4L</b>                                                                        | 161          | 51           |

$\Delta L_1$  = variazione dimensionale rispetto alla quota LB del motore standard corrispondente.

$\Delta L_2$  = variazione dimensionale rispetto alla quota LB del motore autofrenante corrispondente. Solo per motori BN.

**U1**

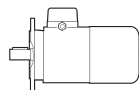


Terminali di alimentazione del ventilatore in scatola morsetti separata.

Nei motori autofrenanti grandezza BN 71...BN 160MR, M1...M4L, con variante **U1**, la leva di sblocco non è collocabile nella posizione AA.

L'opzione non è disponibile per i motori conformi alle norme CSA e UL (opzione CUS).

**U2**



I terminali del ventilatore sono collocati nella scatola morsettiera principale del motore. L'opzione **U2** non è applicabile ai motori da BN 160 a BN 200L, M5, con eccezione dei motori BN 160MR, per i quali l'opzione è disponibile e ai motori con opzione CUS (conformi alle norme CSA e UL).

(F 59)

|  |  | V a.c.<br>±10%  | Hz      | P<br>[W]    | I<br>[A]    |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------|---------|-------------|-------------|
| BN 71                                                                               | M1                                                                                  | 1 ~ 230         | 50 / 60 | 22          | 0.12        |
| BN 80                                                                               | M2                                                                                  |                 |         | 22          | 0.12        |
| BN 90                                                                               | —                                                                                   |                 |         | 40          | 0.30        |
| BN 100                                                                              | M3                                                                                  | 40              |         | 0.26 / 0.09 |             |
| BN 112                                                                              | —                                                                                   | 3 ~ 230Δ / 400Y |         | 50          | 0.26 / 0.15 |
| BN 132 ... BN 160MR                                                                 | M4L                                                                                 |                 |         | 110         | 0.38 / 0.22 |

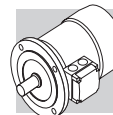
### M9.13 Tettuccio parapigioggia

**RC**

Il dispositivo parapigioggia, che è raccomandato quando il motore è montato verticalmente con l'albero verso il basso, serve a proteggere il motore stesso dall'ingresso di corpi solidi e dallo stillicidio.

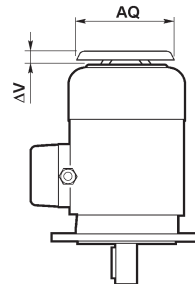
Le dimensioni aggiuntive sono indicate nella tabella sottostante.

Il tettuccio esclude le varianti PS, EN1, EN2, EN3, EN4, EN5, EN6.



(F 60)

|  | AQ  | $\Delta V$ |  |
|-----------------------------------------------------------------------------------|-----|------------|--|
| BN 63                                                                             | 118 | 24         |  |
| BN 71                                                                             | 134 | 27         |  |
| BN 80                                                                             | 152 | 25         |  |
| BN 90                                                                             | 168 | 30         |  |
| BN 100                                                                            | 190 | 28         |  |
| BN 112                                                                            | 211 | 32         |  |
| BN 132...BN 160MR                                                                 | 254 | 32         |  |
| BN 160M...BN 180M                                                                 | 302 | 36         |  |
| BN 180L...BN 200L                                                                 | 340 | 36         |  |



#### M9.14 Tettuccio tessile

##### TC

La variante del tettuccio tipo TC è da specificare quando il motore è installato in ambienti dell'industria tessile, dove sono presenti filamenti che potrebbero ostruire la griglia del coprimentola, impedendo il regolare flusso dell'aria di raffreddamento.

L'opzione esclude le varianti EN1, EN2, EN3, EN4, EN5, EN6. L'ingombro complessivo è lo stesso del tettuccio tipo RC.

#### M9.15 Dispositivi di retroazione

I motori possono essere dotati di sei diversi tipi di encoder, qui di seguito descritti.

Il montaggio dell'encoder esclude le esecuzioni con doppia estremità d'albero (PS) e tettuccio di protezione (RC, TC).

##### EN1

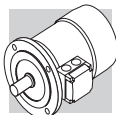
Encoder incrementale,  $V_{IN} = 5\text{ V}$ , uscita line-driver RS 422.

##### EN2

Encoder incrementale,  $V_{IN} = 10\text{-}30\text{ V}$ , uscita line driver RS 422.

##### EN3

Encoder incrementale,  $V_{IN} = 12\text{-}30\text{ V}$ , uscita push-pull 12-30 V



## EN4

Encoder sin/cos,  $V_{IN} = 4.5-5.5$  V, uscita Sinus  $0.5V_{PP}$ .

## EN5

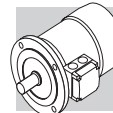
Encoder assoluto monogiro, interfaccia HIPERFACE®,  $V_{IN} = 7-12$  V.

## EN6

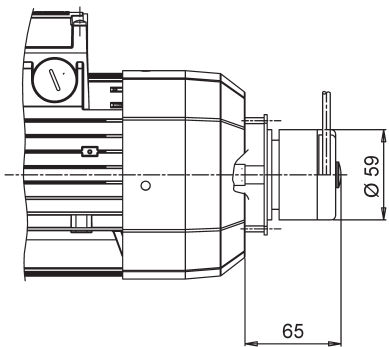
Encoder assoluto multigiro, interfaccia HIPERFACE®,  $V_{IN} = 7-12$  V.

(F 61)

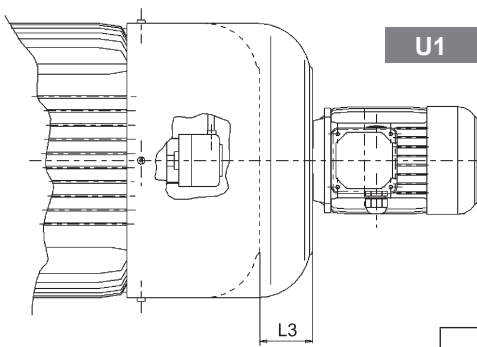
|                                            | EN1                                     | EN2        | EN3           | EN4                                       | EN5        | EN6        |
|--------------------------------------------|-----------------------------------------|------------|---------------|-------------------------------------------|------------|------------|
| interfaccia                                | TTL/RS 422                              | TTL/RS 422 | HTL/push-pull | Sinus 0.5 VPP                             | HIPERFACE® | HIPERFACE® |
| tensione alimentazione [V]                 | 4...6                                   | 10...30    | 12...30       | 4.4...5.5                                 | 7...12     | 7...12     |
| tensione di uscita [V]                     | 5                                       | 5          | 12...30       | —                                         | —          | —          |
| corrente di esercizio senza carico [mA]    | 120                                     | 100        | 100           | 40                                        | 80         | 80         |
| n° di impulsi per giro                     | 1024                                    |            |               |                                           |            |            |
| risoluzione                                | —                                       | —          | —             | —                                         | 15 bit     | 15 bit     |
| rivoluzioni                                | —                                       | —          | —             | —                                         | —          | 12 bit     |
| n° segnali                                 | 6 (A, B, Z + segnali invertiti)         |            |               | 6 (cos-, cos+, sin-, sin+, Z, $\bar{Z}$ ) | —          | —          |
| max. frequenza di uscita [kHz]             | 600                                     |            |               | 200                                       |            |            |
| max. velocità [min <sup>-1</sup> ]         | 6000 (9000 min <sup>-1</sup> per 10 s ) |            |               |                                           |            |            |
| campo di temperatura di funzionamento [°C] | -30 ... +100                            |            |               |                                           |            |            |
| grado di protezione                        | IP 65                                   |            |               |                                           |            |            |



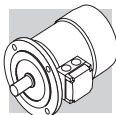
(F 62)

| EN1, EN2, EN3, EN4, EN5, EN6                                                      |                |
|-----------------------------------------------------------------------------------|----------------|
|  |                |
| BN 63...BN 200L                                                                   | M05...M5       |
| BN 63_FD...BN 200L_FD                                                             | M05_FD...M5_FD |
| BN 63_FA...BN 200L_FA                                                             | M05_FA...M5_FA |

(F 63)

| EN_ + U1                                                                             |       |          |
|--------------------------------------------------------------------------------------|-------|----------|
|  |       |          |
| BN 160M...BN 180M                                                                    | M5    | L3<br>72 |
| BN 180L...BN 200L                                                                    | -     | 82       |
| BN 160M_FD...BN 180M_FD                                                              | M5_FD | 35       |
| BN 180L_FD...BN 200L_FD                                                              | -     | 41       |

Se l'opzione EN\_ è richiesta per motori di grandezza BN71...BN160MR / M1...M4, contemporaneamente all'opzione U1/U2, le variazioni dimensionali coincidono con quelle dell'opzione U1/U2.



## M9.16 Protezione superficiale

**C**

I motori, che laddove non viene richiesta una classe di protezione specifica, nelle zone verniciate (ferrose) rispettano come requisito minimo la classe di protezione C2 (UNI EN ISO 12944-2), sono forniti con protezione superficiale C3 e C4 per una migliore resistenza alla corrosione atmosferica.

| PROTEZIONE SUPERFICIALE | Ambienti tipici                                                                                                            | Temperatura superficiale max. | Classe di corrosività secondo UNI EN ISO 12944-2 |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------|
| <b>C3</b>               | Ambienti urbani ed industriali, con umidità relativa dell'aria max. 100% (inquinamento ambientale medio)                   | 120°C                         | C3                                               |
| <b>C4</b>               | Aree industriali, zone costiere, impianti chimici, con umidità relativa dell'aria max. 100% (inquinamento ambientale alto) | 120°C                         | C4                                               |

I motori previsti con le protezioni opzionali C3 e C4 sono disponibili in diverse tinte.

Se non specificata nessuna tinta (vedere opzione “VERNICIATURA”) la fornitura viene eseguita con la tinta RAL7042.

A richiesta sono fornibili motori per classe di corrosività C5 secondo UNI EN ISO 12944-2, contattando il ns. Servizio tecnico-Commerciale.

## M9.17 Verniciatura

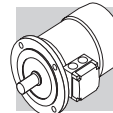
**RAL**

I motori previsti con le protezioni opzionali C3 e C4 sono disponibili in diverse tinte, secondo la tabella seguente.

| VERNICIATURA    | Colore              | Catalogazione RAL |
|-----------------|---------------------|-------------------|
| <b>RAL7042*</b> | Grigio traffico A   | 7042              |
| <b>RAL5010</b>  | Blu genziana        | 5010              |
| <b>RAL9005</b>  | Nero intenso        | 9005              |
| <b>RAL9006</b>  | Alluminio brillante | 9006              |
| <b>RAL9010</b>  | Bianco puro         | 9010              |
| <b>RAL7035</b>  | Grigio chiaro       | 7035              |
| <b>RAL7001</b>  | Grigio argento      | 7001              |
| <b>RAL5015</b>  | Blu cielo           | 5015              |
| <b>RAL7037</b>  | Grigio polvere      | 7037              |
| <b>RAL5024</b>  | Blu pastello        | 5024              |

\* Colore di fornitura standard se non specificato diversamente

NOTA - L'opzione “VERNICIATURA” è configurabile esclusivamente in abbinamento con l'opzione “PROTEZIONE SUPERFICIALE”.



## M9.18 Prove documentali

### ACM

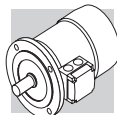
#### **Attestato di conformità motori**

Documento il cui rilascio attesta la conformità del prodotto all'ordinativo e la costruzione dello stesso in conformità alle procedure standard di processo e di controllo previste dal sistema di Qualità Bonfiglioli Riduttori.

### CC

#### **Certificato di collaudo**

La specifica comporta la conduzione di verifiche di conformità all'ordine, controlli visivi generali e verifiche strumentali delle caratteristiche elettriche di funzionamento a vuoto. Il collaudo è riferito allo specifico motore analizzato ed applicato ad un campione statistico del lotto di spedizione.

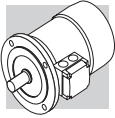


## M10 DATI TECNICI MOTORI

| 2P             |                                                                                     | 3000 min <sup>-1</sup> - S1 |                |     |             |            |            |      |                        |                                  |                                  | 50 Hz                            |                                                          |                                                                                              |        |            |                       |      |                                                          |                                                                                            |        |      |                       |                                                          |      |
|----------------|-------------------------------------------------------------------------------------|-----------------------------|----------------|-----|-------------|------------|------------|------|------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------|--------|------------|-----------------------|------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|--------|------|-----------------------|----------------------------------------------------------|------|
|                |                                                                                     | freno c.c.                  |                |     |             |            |            |      |                        |                                  |                                  |                                  |                                                          |                                                                                              |        | freno c.a. |                       |      |                                                          |                                                                                            |        |      |                       |                                                          |      |
| P <sub>n</sub> |  | n                           | M <sub>n</sub> | IE1 | η<br>(100%) | η<br>(75%) | η<br>(50%) | cosφ | I <sub>n</sub><br>400V | I <sub>s</sub><br>I <sub>n</sub> | M <sub>s</sub><br>M <sub>n</sub> | M <sub>a</sub><br>M <sub>n</sub> | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | FD     |            |                       |      | FA                                                       |                                                                                            |        |      |                       |                                                          |      |
|                |                                                                                     |                             |                |     |             |            |            |      |                        |                                  |                                  |                                  |                                                          |                                                                                              | Mod    | Mb         | Z <sub>o</sub><br>1/h |      | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | Mod    | Mb   | Z <sub>o</sub><br>1/h | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> |      |
| 0.18           | BN 63A                                                                              | 2                           | 0.63           | ○   | 59.9        | 56.9       | 51.9       | 0.77 | 0.56                   | 3.0                              | 2.1                              | 2.0                              | 2.0                                                      | 3.5                                                                                          | FD 02  | 1.75       | 3900                  | 4800 | 2.6                                                      | 5.2                                                                                        | FA 02  | 1.75 | 4800                  | 2.6                                                      | 5.0  |
| 0.25           | BN 63B                                                                              | 2                           | 0.87           | ○   | 66.0        | 64.8       | 64.8       | 0.76 | 0.72                   | 3.3                              | 2.3                              | 2.3                              | 2.3                                                      | 3.9                                                                                          | FD 02  | 1.75       | 3900                  | 4800 | 3.0                                                      | 5.6                                                                                        | FA 02  | 1.75 | 4800                  | 3.0                                                      | 5.4  |
| 0.37           | BN 63C                                                                              | 2                           | 1.26           | ○   | 69.1        | 66.8       | 66.8       | 0.78 | 0.99                   | 3.9                              | 2.6                              | 2.6                              | 3.3                                                      | 5.1                                                                                          | FD 02  | 3.5        | 3600                  | 4500 | 3.9                                                      | 6.8                                                                                        | FA 02  | 3.5  | 4500                  | 3.9                                                      | 6.6  |
| 0.37           | BN 71A                                                                              | 2                           | 1.25           | ○   | 73.8        | 73.0       | 70.6       | 0.76 | 0.95                   | 4.8                              | 2.8                              | 2.6                              | 3.5                                                      | 5.4                                                                                          | FD 03  | 3.5        | 3000                  | 4100 | 4.6                                                      | 8.1                                                                                        | FA 03  | 3.5  | 4200                  | 4.6                                                      | 7.8  |
| 0.55           | BN 71B                                                                              | 2                           | 1.86           | ○   | 76.0        | 75.8       | 74.8       | 0.76 | 1.37                   | 5.0                              | 2.9                              | 2.8                              | 4.1                                                      | 6.2                                                                                          | FD 03  | 5          | 2900                  | 4200 | 5.3                                                      | 8.9                                                                                        | FA 03  | 5    | 4200                  | 5.3                                                      | 8.6  |
| 0.75           | BN 71C                                                                              | 2                           | 2.6            | ○   | 76.6        | 76.2       | 76.2       | 0.76 | 1.86                   | 5.1                              | 3.1                              | 2.8                              | 5.0                                                      | 7.3                                                                                          | FD 03  | 5          | 1900                  | 3300 | 6.1                                                      | 10.0                                                                                       | FA 03  | 5    | 3600                  | 6.1                                                      | 9.7  |
| 0.75           | BN 80A                                                                              | 2                           | 2.6            | ●   | 76.2        | 75.5       | 68.3       | 0.81 | 1.75                   | 4.8                              | 2.6                              | 2.2                              | 7.8                                                      | 8.6                                                                                          | FD 04  | 5          | 1700                  | 3200 | 9.4                                                      | 12.5                                                                                       | FA 04  | 5    | 3200                  | 9.4                                                      | 12.4 |
| 1.1            | BN 80B                                                                              | 2                           | 3.8            | ●   | 76.4        | 76.2       | 75.0       | 0.81 | 2.57                   | 4.8                              | 2.8                              | 2.4                              | 9.0                                                      | 9.5                                                                                          | FD 04  | 10         | 1500                  | 3000 | 10.6                                                     | 13.4                                                                                       | FA 04  | 10   | 3000                  | 10.6                                                     | 13.3 |
| 1.5            | BN 80C                                                                              | 2                           | 5.1            | ●   | 79.1        | 79.5       | 77.2       | 0.81 | 3.4                    | 4.9                              | 2.7                              | 2.4                              | 11.4                                                     | 11.3                                                                                         | FD 04  | 15         | 1300                  | 2600 | 13.0                                                     | 15.2                                                                                       | FA 04  | 15   | 2600                  | 13.0                                                     | 15.1 |
| 1.5            | BN 90SA                                                                             | 2                           | 5.0            | ●   | 82.0        | 81.5       | 78.1       | 0.80 | 3.4                    | 5.9                              | 2.7                              | 2.6                              | 12.5                                                     | 12.3                                                                                         | FD 14  | 15         | 900                   | 2200 | 14.1                                                     | 16.5                                                                                       | FA 14  | 15   | 2200                  | 14.1                                                     | 16.4 |
| 1.85           | BN 90SB                                                                             | 2                           | 6.1            | ●   | 82.5        | 82.0       | 75.4       | 0.80 | 4.0                    | 6.2                              | 2.9                              | 2.6                              | 16.7                                                     | 14                                                                                           | FD 14  | 15         | 900                   | 2200 | 18.3                                                     | 18.2                                                                                       | FA 14  | 15   | 2200                  | 18.3                                                     | 18.1 |
| 2.2            | BN 90L                                                                              | 2                           | 7.3            | ●   | 82.7        | 82.1       | 80.8       | 0.80 | 4.8                    | 6.3                              | 2.9                              | 2.7                              | 16.7                                                     | 14                                                                                           | FD 05  | 26         | 900                   | 2200 | 21                                                       | 20                                                                                         | FA 05  | 26   | 2200                  | 21                                                       | 20.7 |
| 3              | BN 100L                                                                             | 2                           | 10.0           | ●   | 81.5        | 81.3       | 77.4       | 0.79 | 6.7                    | 5.6                              | 2.6                              | 2.2                              | 31                                                       | 20                                                                                           | FD 15  | 26         | 700                   | 1600 | 35                                                       | 26                                                                                         | FA 15  | 26   | 1600                  | 35                                                       | 27   |
| 4              | BN 100LB                                                                            | 2                           | 13.3           | ●   | 83.1        | 83.0       | 77.8       | 0.80 | 8.7                    | 5.8                              | 2.7                              | 2.5                              | 39                                                       | 23                                                                                           | FD 15  | 40         | 450                   | 900  | 43                                                       | 29                                                                                         | FA 15  | 40   | 1000                  | 43                                                       | 30   |
| 4              | BN 112M                                                                             | 2                           | 13.2           | ●   | 85.5        | 84.5       | 83.0       | 0.82 | 8.2                    | 6.9                              | 3.0                              | 2.9                              | 57                                                       | 28                                                                                           | FD 06S | 40         | —                     | 950  | 66                                                       | 39                                                                                         | FA 06S | 40   | 950                   | 66                                                       | 40   |
| 5.5            | BN 132SA                                                                            | 2                           | 18.2           | ●   | 84.7        | 84.5       | 81.2       | 0.84 | 11.2                   | 5.9                              | 2.6                              | 2.2                              | 101                                                      | 35                                                                                           | FD 06  | 50         | —                     | 600  | 112                                                      | 48                                                                                         | FA 06  | 50   | 600                   | 112                                                      | 49   |
| 7.5            | BN 132SB                                                                            | 2                           | 25             | ●   | 86.5        | 86.3       | 84.4       | 0.85 | 14.7                   | 6.4                              | 2.6                              | 2.2                              | 145                                                      | 42                                                                                           | FD 06  | 50         | —                     | 550  | 154                                                      | 55                                                                                         | FA 06  | 50   | 550                   | 154                                                      | 56   |
| 9.2            | BN 132M                                                                             | 2                           | 30             | ●   | 87.0        | 86.5       | 83.6       | 0.86 | 17.7                   | 6.7                              | 2.8                              | 2.3                              | 178                                                      | 53                                                                                           | FD 56  | 75         | —                     | 430  | 189                                                      | 66                                                                                         | FA 06  | 75   | 430                   | 189                                                      | 67   |
| 11             | BN 160MR                                                                            | 2                           | 36             | ●   | 87.6        | 87.0       | 86.0       | 0.88 | 20.6                   | 6.9                              | 2.9                              | 2.5                              | 210                                                      | 65                                                                                           |        |            |                       |      |                                                          |                                                                                            |        |      |                       |                                                          |      |
| 15             | BN 160MB                                                                            | 2                           | 49             | ●   | 89.6        | 89.4       | 88.0       | 0.86 | 28.1                   | 7.1                              | 2.6                              | 2.3                              | 340                                                      | 84                                                                                           |        |            |                       |      |                                                          |                                                                                            |        |      |                       |                                                          |      |
| 18.5           | BN 160L                                                                             | 2                           | 60             | ●   | 90.4        | 90.1       | 89.0       | 0.86 | 34                     | 7.6                              | 2.7                              | 2.3                              | 420                                                      | 97                                                                                           |        |            |                       |      |                                                          |                                                                                            |        |      |                       |                                                          |      |
| 22             | BN 180M                                                                             | 2                           | 72             | ●   | 89.9        | 89.7       | 89.5       | 0.88 | 40                     | 7.8                              | 2.6                              | 2.4                              | 490                                                      | 109                                                                                          |        |            |                       |      |                                                          |                                                                                            |        |      |                       |                                                          |      |
| 30             | BN 200LA                                                                            | 2                           | 98             | ●   | 90.7        | 90.1       | 87.6       | 0.89 | 54                     | 7.8                              | 2.7                              | 2.9                              | 770                                                      | 140                                                                                          |        |            |                       |      |                                                          |                                                                                            |        |      |                       |                                                          |      |

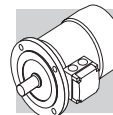
○ = n.a.    ● = IE1

$\bullet = \text{n.a.}$

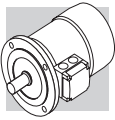


| 6P             |                                                                                     |   |                |     |             |            |            |      |            |          |          |          |                                                          | 1000 min <sup>-1</sup> - S1                                                                 |        |     |                       |                                                          |                                                                                            |      |        |                       |                                                          |                                                                                            |      |  |  | 50 Hz      |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------|-------------------------------------------------------------------------------------|---|----------------|-----|-------------|------------|------------|------|------------|----------|----------|----------|----------------------------------------------------------|---------------------------------------------------------------------------------------------|--------|-----|-----------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|------|--------|-----------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|------|--|--|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                |                                                                                     |   |                |     |             |            |            |      |            |          |          |          |                                                          | freno c.c.                                                                                  |        |     |                       |                                                          |                                                                                            |      |        |                       |                                                          |                                                                                            |      |  |  | freno c.a. |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                |                                                                                     |   |                |     |             |            |            |      |            |          |          |          |                                                          | FD                                                                                          |        |     |                       |                                                          |                                                                                            |      |        |                       |                                                          |                                                                                            |      |  |  | FA         |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P <sub>n</sub> |  | n | M <sub>n</sub> | IE1 | η<br>(100%) | η<br>(75%) | η<br>(50%) | cosφ | In<br>400V | Is<br>In | Ms<br>Mn | Ma<br>Mn | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | Mod    | Mb  | Z <sub>0</sub><br>1/h | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | Mod  | Mb     | Z <sub>0</sub><br>1/h | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> |      |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.09           | BN 63A                                                                              | 6 | 0.98           | ○   | 41.0        | 41.0       | 32.9       | 0.53 | 0.60       | 2.1      | 2.1      | 1.8      | 3.4                                                      | 4.6                                                                                         | FD 02  | 3.5 | 9000                  | 14000                                                    | 4.0                                                                                        | 6.3  | FA 02  | 3.5                   | 14000                                                    | 4.0                                                                                        | 6.1  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.12           | BN 63B                                                                              | 6 | 1.32           | ○   | 45.0        | 44.0       | 41.8       | 0.60 | 0.64       | 2.1      | 1.9      | 1.7      | 3.7                                                      | 4.9                                                                                         | FD 02  | 3.5 | 9000                  | 14000                                                    | 4.3                                                                                        | 6.6  | FA 02  | 3.5                   | 14000                                                    | 4.3                                                                                        | 6.4  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.18           | BN 71A                                                                              | 6 | 1.91           | ○   | 55.0        | 55.5       | 51.0       | 0.69 | 0.68       | 2.6      | 1.9      | 1.7      | 8.4                                                      | 5.5                                                                                         | FD 03  | 5   | 8100                  | 13500                                                    | 9.5                                                                                        | 8.2  | FA 03  | 5.0                   | 13500                                                    | 9.5                                                                                        | 7.9  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.25           | BN 71B                                                                              | 6 | 2.70           | ○   | 62.0        | 58.5       | 51.4       | 0.71 | 0.82       | 2.6      | 1.9      | 1.7      | 10.9                                                     | 6.7                                                                                         | FD 03  | 5   | 7800                  | 13000                                                    | 12                                                                                         | 9.4  | FA 03  | 5.0                   | 13000                                                    | 12                                                                                         | 9.1  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.37           | BN 71C                                                                              | 6 | 3.9            | ○   | 66.0        | 60.0       | 53.3       | 0.69 | 1.17       | 3.0      | 2.4      | 2.0      | 12.9                                                     | 7.7                                                                                         | FD 53  | 7.5 | 5100                  | 9500                                                     | 14                                                                                         | 10.4 | FA 03  | 7.5                   | 9500                                                     | 14                                                                                         | 10.1 |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.37           | BN 80A                                                                              | 6 | 3.9            | ○   | 68.0        | 67.4       | 63.3       | 0.68 | 1.15       | 3.2      | 2.2      | 2.0      | 21                                                       | 9.9                                                                                         | FD 04  | 10  | 5200                  | 8500                                                     | 23                                                                                         | 13.8 | FA 04  | 10                    | 8500                                                     | 23                                                                                         | 13.7 |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.55           | BN 80B                                                                              | 6 | 5.7            | ○   | 70.0        | 69.8       | 64.3       | 0.68 | 1.67       | 3.9      | 2.6      | 2.2      | 25                                                       | 11.3                                                                                        | FD 04  | 15  | 4800                  | 7200                                                     | 27                                                                                         | 15.2 | FA 04  | 15                    | 7200                                                     | 27                                                                                         | 15.1 |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.75           | BN 80C                                                                              | 6 | 7.8            | ●   | 70.0        | 70.0       | 64.4       | 0.65 | 2.38       | 3.8      | 2.5      | 2.2      | 28                                                       | 12.2                                                                                        | FD 04  | 15  | 3400                  | 6400                                                     | 30                                                                                         | 16.1 | FA 04  | 15                    | 6400                                                     | 30                                                                                         | 16.0 |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.75           | BN 90S                                                                              | 6 | 7.8            | ●   | 70.0        | 69.0       | 64.2       | 0.68 | 2.27       | 3.8      | 2.4      | 2.2      | 26                                                       | 12.6                                                                                        | FD 14  | 15  | 3400                  | 6500                                                     | 28                                                                                         | 16.8 | FA 14  | 15                    | 6500                                                     | 28                                                                                         | 16.7 |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.1            | BN 90L                                                                              | 6 | 11.4           | ●   | 72.9        | 72.6       | 69.1       | 0.69 | 3.2        | 3.9      | 2.3      | 2.0      | 33                                                       | 15                                                                                          | FD 05  | 26  | 2700                  | 5000                                                     | 37                                                                                         | 21   | FA 05  | 26                    | 5000                                                     | 37                                                                                         | 22   |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.5            | BN 100LA                                                                            | 6 | 15.2           | ●   | 75.2        | 74.2       | 70.3       | 0.72 | 4.0        | 4.1      | 2.1      | 2.0      | 82                                                       | 22                                                                                          | FD 15  | 40  | 1900                  | 4100                                                     | 86                                                                                         | 28   | FA 15  | 40                    | 4100                                                     | 86                                                                                         | 29   |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.85           | BN 100LB                                                                            | 6 | 19.0           | ●   | 76.6        | 72.8       | 62.6       | 0.73 | 4.8        | 4.6      | 2.1      | 2.0      | 95                                                       | 24                                                                                          | FD 15  | 40  | 1700                  | 3600                                                     | 99                                                                                         | 30   | FA 15  | 40                    | 3600                                                     | 99                                                                                         | 31   |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2.2            | BN 112M                                                                             | 6 | 22             | ●   | 78.5        | 79.0       | 76.5       | 0.73 | 5.5        | 4.8      | 2.2      | 2.0      | 168                                                      | 32                                                                                          | FD 06S | 60  | —                     | 2100                                                     | 177                                                                                        | 42   | FA 06S | 60                    | 2100                                                     | 177                                                                                        | 44   |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3              | BN 132S                                                                             | 6 | 30             | ●   | 79.7        | 77.0       | 75.1       | 0.76 | 7.1        | 5.1      | 1.9      | 1.8      | 216                                                      | 36                                                                                          | FD 56  | 75  | —                     | 1400                                                     | 226                                                                                        | 49   | FA 06  | 75                    | 1400                                                     | 226                                                                                        | 50   |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4              | BN 132MA                                                                            | 6 | 40             | ●   | 81.4        | 81.5       | 79.5       | 0.77 | 9.2        | 5.5      | 2.0      | 1.8      | 295                                                      | 45                                                                                          | FD 06  | 100 | —                     | 1200                                                     | 305                                                                                        | 58   | FA 07  | 100                   | 1200                                                     | 318                                                                                        | 63   |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.5            | BN 132MB                                                                            | 6 | 56             | ●   | 83.1        | 80.9       | 79.1       | 0.78 | 12.2       | 6.1      | 2.1      | 1.9      | 383                                                      | 56                                                                                          | FD 07  | 150 | —                     | 1050                                                     | 406                                                                                        | 72   | FA 07  | 150                   | 1050                                                     | 406                                                                                        | 74   |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7.5            | BN 160M                                                                             | 6 | 75             | ●   | 85.0        | 85.0       | 84.8       | 0.81 | 15.7       | 5.9      | 2.2      | 2.0      | 740                                                      | 83                                                                                          | FD 08  | 170 | —                     | 900                                                      | 815                                                                                        | 112  | FA 08  | 170                   | 900                                                      | 815                                                                                        | 113  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11             | BN 160L                                                                             | 6 | 109            | ●   | 86.4        | 86.5       | 85.9       | 0.81 | 22.7       | 6.6      | 2.5      | 2.3      | 970                                                      | 103                                                                                         | FD 08  | 200 | —                     | 800                                                      | 1045                                                                                       | 133  | FA 08  | 200                   | 800                                                      | 1045                                                                                       | 133  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 15             | BN 180L                                                                             | 6 | 148            | ●   | 87.7        | 88.0       | 87.3       | 0.82 | 30         | 6.2      | 2.0      | 2.4      | 1550                                                     | 130                                                                                         | FD 09  | 300 | —                     | 600                                                      | 1750                                                                                       | 170  | —      | —                     | —                                                        | —                                                                                          | —    |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 18.5           | BN 200LA                                                                            | 6 | 184            | ●   | 88.6        | 88.0       | 87.3       | 0.81 | 37         | 5.9      | 2.0      | 2.3      | 1700                                                     | 145                                                                                         | FD 09  | 400 | —                     | 450                                                      | 1900                                                                                       | 185  | —      | —                     | —                                                        | —                                                                                          | —    |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |

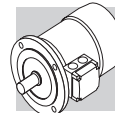
○ = n.a.      ● = IE1



| 750 min <sup>-1</sup> - S1 |                                                                                     |                        |                      |    |      |                             |                   |                   |                   |                                                          |                                                                                              |        | 50 Hz    |                       |                                                          |                                                                                              |      |            |                       |                                                          |                                                                                              |      |
|----------------------------|-------------------------------------------------------------------------------------|------------------------|----------------------|----|------|-----------------------------|-------------------|-------------------|-------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------|--------|----------|-----------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------|------|------------|-----------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------|------|
| freno c.c.                 |                                                                                     |                        |                      |    |      |                             |                   |                   |                   |                                                          |                                                                                              |        |          |                       |                                                          |                                                                                              |      | freno c.a. |                       |                                                          |                                                                                              |      |
|                            |  | n<br>min <sup>-1</sup> | M <sub>n</sub><br>Nm | η  | cosφ | I <sub>n</sub><br>400V<br>A | $\frac{I_s}{I_n}$ | $\frac{M_s}{M_n}$ | $\frac{M_a}{M_n}$ | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | FD     |          |                       |                                                          | FA                                                                                           |      |            |                       |                                                          |                                                                                              |      |
|                            |                                                                                     |                        |                      |    |      |                             |                   |                   |                   |                                                          |                                                                                              | Mod    | Mb<br>Nm | Z <sub>o</sub><br>1/h | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | Mod  | Mb<br>Nm   | Z <sub>o</sub><br>1/h | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> |      |
| 0.09                       | BN 71A                                                                              | 8                      | 1.26                 | 47 | 0.59 | 0.47                        | 2.3               | 2.4               | 2.3               | 10.9                                                     | 6.7                                                                                          | FD 03  | 3.5      | 9000                  | 16000                                                    | 12.0                                                                                         | 9.4  | FA 03      | 3.5                   | 16000                                                    | 12.0                                                                                         | 9.1  |
| 0.12                       | BN 71B                                                                              | 8                      | 1.69                 | 51 | 0.59 | 0.58                        | 2.1               | 2.3               | 2.2               | 12.9                                                     | 7.7                                                                                          | FD 03  | 5.0      | 9000                  | 16000                                                    | 14.0                                                                                         | 10.4 | FA 03      | 5.0                   | 16000                                                    | 14.0                                                                                         | 10.1 |
| 0.18                       | BN 80A                                                                              | 8                      | 2.49                 | 51 | 0.60 | 0.85                        | 2.4               | 2.2               | 2.2               | 15                                                       | 8.2                                                                                          | FD 04  | 5.0      | 6500                  | 11000                                                    | 16.6                                                                                         | 12.1 | FA 04      | 5.0                   | 11000                                                    | 16.6                                                                                         | 12.0 |
| 0.25                       | BN 80B                                                                              | 8                      | 3.51                 | 54 | 0.63 | 1.06                        | 2.4               | 2.0               | 1.9               | 20                                                       | 9.9                                                                                          | FD 04  | 10.0     | 6000                  | 10000                                                    | 22                                                                                           | 13.8 | FA 04      | 10.0                  | 10000                                                    | 23                                                                                           | 13.7 |
| 0.37                       | BN 90S                                                                              | 8                      | 5.2                  | 58 | 0.60 | 1.53                        | 2.6               | 2.3               | 2.1               | 26                                                       | 12.6                                                                                         | FD 14  | 15.0     | 4800                  | 7500                                                     | 28                                                                                           | 16.8 | FA 14      | 15.0                  | 7500                                                     | 28                                                                                           | 16.7 |
| 0.55                       | BN 90L                                                                              | 8                      | 7.8                  | 62 | 0.60 | 2.13                        | 2.6               | 2.2               | 2.0               | 33                                                       | 15                                                                                           | FD 05  | 26       | 4000                  | 6400                                                     | 37                                                                                           | 21   | FA 05      | 26                    | 6400                                                     | 37                                                                                           | 22   |
| 0.75                       | BN 100LA                                                                            | 8                      | 10.2                 | 68 | 0.63 | 2.53                        | 3.4               | 1.9               | 1.7               | 82                                                       | 22                                                                                           | FD 15  | 26       | 2800                  | 4800                                                     | 86                                                                                           | 28   | FA 15      | 26                    | 4800                                                     | 86                                                                                           | 29   |
| 1.1                        | BN 100LB                                                                            | 8                      | 15.0                 | 68 | 0.64 | 3.65                        | 3.2               | 1.7               | 1.7               | 95                                                       | 24                                                                                           | FD 15  | 40       | 2500                  | 4000                                                     | 99                                                                                           | 30   | FA 15      | 40                    | 4000                                                     | 99                                                                                           | 31   |
| 1.5                        | BN 112M                                                                             | 8                      | 20.2                 | 71 | 0.66 | 4.6                         | 3.7               | 1.8               | 1.9               | 168                                                      | 32                                                                                           | FD 06S | 60       | —                     | 3000                                                     | 177                                                                                          | 42   | FA 06S     | 60                    | 3000                                                     | 177                                                                                          | 44   |
| 2.2                        | BN 132S                                                                             | 8                      | 29.6                 | 75 | 0.66 | 6.4                         | 3.8               | 1.8               | 2.0               | 295                                                      | 45                                                                                           | FD 56  | 75       | —                     | 2300                                                     | 305                                                                                          | 58   | FA 06      | 75                    | 2300                                                     | 305                                                                                          | 56   |
| 3                          | BN 132MA                                                                            | 8                      | 40.4                 | 76 | 0.69 | 8.3                         | 3.9               | 1.6               | 1.8               | 370                                                      | 53                                                                                           | FD 06  | 100      | —                     | 1900                                                     | 394                                                                                          | 69   | FA 07      | 100                   | 1900                                                     | 406                                                                                          | 74   |



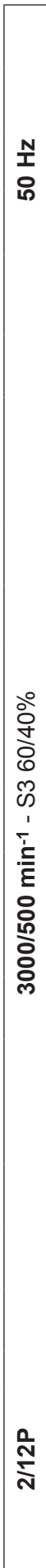
| 3000/1500 min <sup>-1</sup> - S1 |                                                                                     |                        |                      |              |              |                 |              |                      |                      |                                                          |                                                                                              |      |          |                             |                                                          |                                                                                            | 50 Hz        |          |                             |                                                          |                                                                                            |      |      |       |  |  |
|----------------------------------|-------------------------------------------------------------------------------------|------------------------|----------------------|--------------|--------------|-----------------|--------------|----------------------|----------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------|------|----------|-----------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------|----------|-----------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|------|------|-------|--|--|
| freno c.c.                       |                                                                                     |                        |                      |              |              |                 |              |                      |                      |                                                          |                                                                                              |      |          |                             |                                                          |                                                                                            | freno c.a.   |          |                             |                                                          |                                                                                            |      |      |       |  |  |
|                                  |                                                                                     |                        |                      |              |              |                 |              |                      |                      |                                                          |                                                                                              |      |          |                             |                                                          |                                                                                            | FD           |          |                             |                                                          |                                                                                            |      |      | IM B5 |  |  |
| P <sub>n</sub><br>kW             |  | n<br>min <sup>-1</sup> | M <sub>n</sub><br>Nm | η<br>%       | cosφ         | In<br>400V<br>A | Is<br>In     | M <sub>s</sub><br>Mn | M <sub>a</sub><br>Mn | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | Mod  | Mb<br>Nm | Z <sub>0</sub><br>1/h<br>NB | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | Mod          | Mb<br>Nm | Z <sub>0</sub><br>1/h<br>SB | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> |      |      |       |  |  |
| 0.20<br>0.15                     | BN 63B                                                                              | 2<br>4                 | 2700<br>1350         | 0.71<br>1.06 | 55<br>49     | 0.82<br>0.67    | 0.64<br>0.66 | 3.5<br>2.6           | 2.1<br>1.8           | 1.9<br>1.7                                               | 2.9                                                                                          | 4.4  | FD 02    | 3.5                         | 2200<br>4000                                             | 2600<br>5100                                                                               | 6.1          | FA 02    | 3.5                         | 2600<br>5100                                             | 3.5                                                                                        | 5.9  |      |       |  |  |
| 0.28<br>0.20                     |                                                                                     | BN 71A                 | 2<br>4               | 2700<br>1370 | 0.99<br>1.39 | 56<br>59        | 0.82<br>0.72 | 0.88<br>0.68         | 2.9<br>3.1           | 1.9<br>1.8                                               | 1.7                                                                                          | 4.7  | 4.4      | FD 03                       | 3.5                                                      | 2100<br>3800                                                                               | 2400<br>4800 | 7.1      | FA 03                       | 3.5                                                      | 2400<br>4800                                                                               | 5.8  | 6.8  |       |  |  |
| 0.37<br>0.25                     | BN 71B                                                                              | 2<br>4                 | 2740<br>1390         | 1.29<br>1.72 | 56<br>60     | 0.82<br>0.73    | 1.16<br>0.82 | 3.5<br>3.3           | 1.8<br>2.0           | 1.8<br>1.9                                               | 5.8                                                                                          | 5.1  | FD 03    | 5.0                         | 1400<br>2900                                             | 2100<br>4200                                                                               | 7.8          | FA 03    | 5.0                         | 2100<br>4200                                             | 6.9                                                                                        | 7.5  |      |       |  |  |
| 0.45<br>0.30                     |                                                                                     | BN 71C                 | 2<br>4               | 2780<br>1400 | 1.55<br>2.0  | 63<br>63        | 0.85<br>0.73 | 1.21<br>0.94         | 3.8<br>3.6           | 1.8<br>2.0                                               | 1.8<br>1.9                                                                                   | 6.9  | 5.9      | FD 03                       | 5.0                                                      | 1400<br>2900                                                                               | 2100<br>4200 | 8.6      | FA 03                       | 5.0                                                      | 2100<br>4200                                                                               | 8.0  | 8.3  |       |  |  |
| 0.55<br>0.37                     | BN 80A                                                                              | 2<br>4                 | 2800<br>1400         | 1.9<br>2.5   | 63<br>67     | 0.85<br>0.79    | 1.48<br>1.01 | 3.9<br>4.1           | 1.7<br>1.8           | 1.7                                                      | 15                                                                                           | 8.2  | FD 04    | 5.0                         | 1600<br>3000                                             | 2300<br>4000                                                                               | 12.1         | FA 04    | 5.0                         | 2300<br>4000                                             | 16.6                                                                                       | 12.0 |      |       |  |  |
| 0.75<br>0.55                     |                                                                                     | BN 80B                 | 2<br>4               | 2780<br>1400 | 2.6<br>3.8   | 65<br>68        | 0.85<br>0.81 | 1.96<br>1.44         | 3.8<br>3.9           | 1.9<br>1.7                                               | 1.8<br>1.7                                                                                   | 20   | 9.9      | FD 04                       | 10                                                       | 1400<br>2700                                                                               | 1600<br>3600 | 13.8     | FA 04                       | 10                                                       | 1600<br>3600                                                                               | 22   | 13.7 |       |  |  |
| 1.1<br>0.75                      | BN 90S                                                                              | 2<br>4                 | 2790<br>1390         | 3.8<br>5.2   | 71<br>66     | 0.82<br>0.79    | 2.73<br>2.08 | 4.7<br>4.6           | 2.3<br>2.4           | 2.0<br>2.2                                               | 21                                                                                           | 12.2 | FD 14    | 10                          | 1500<br>2300                                             | 1600<br>2800                                                                               | 16.4         | FA 14    | 10                          | 1600<br>2800                                             | 23                                                                                         | 16.3 |      |       |  |  |
| 1.5<br>1.1                       |                                                                                     | BN 90L                 | 2<br>4               | 2780<br>1390 | 5.2<br>7.6   | 70<br>73        | 0.85<br>0.81 | 3.64<br>2.69         | 4.5<br>4.7           | 2.4<br>2.5                                               | 2.1<br>2.2                                                                                   | 28   | 14.0     | FD 05                       | 26                                                       | 1050<br>1600                                                                               | 1200<br>2000 | 20       | FA 05                       | 26                                                       | 1200<br>2000                                                                               | 32   | 21   |       |  |  |
| 2.2<br>1.5                       | BN 100LA                                                                            | 2<br>4                 | 2800<br>1410         | 7.5<br>10.2  | 72<br>73     | 0.85<br>0.79    | 5.2<br>3.8   | 4.5<br>4.7           | 2.0<br>2.0           | 1.9<br>2.0                                               | 40                                                                                           | 18.3 | FD 15    | 26                          | 600<br>1300                                              | 900<br>2300                                                                                | 25           | FA 15    | 26                          | 900<br>2300                                              | 44                                                                                         | 25   |      |       |  |  |
| 3.5<br>2.5                       |                                                                                     | BN 100LB               | 2<br>4               | 2850<br>1420 | 11.7<br>16.8 | 80<br>82        | 0.84<br>0.80 | 7.5<br>5.5           | 5.4<br>5.2           | 2.2<br>2.2                                               | 2.1<br>2.2                                                                                   | 61   | 25       | FD 15                       | 40                                                       | 500<br>1000                                                                                | 900<br>2100  | 31       | FA 15                       | 40                                                       | 900<br>2100                                                                                | 65   | 32   |       |  |  |
| 4<br>3.3                         | BN 112M                                                                             | 2<br>4                 | 2880<br>1420         | 13.3<br>22.2 | 79<br>80     | 0.83<br>0.80    | 8.8<br>7.4   | 6.1<br>5.1           | 2.4<br>2.1           | 2.0<br>2.0                                               | 98                                                                                           | 30   | FD 06S   | 60                          | —<br>—                                                   | 700<br>1200                                                                                | 40           | FA 06S   | 60                          | 700<br>1200                                              | 107                                                                                        | 42   |      |       |  |  |
| 5.5<br>4.4                       |                                                                                     | BN 132S                | 2<br>4               | 2890<br>1440 | 18.2<br>29   | 80<br>82        | 0.87<br>0.84 | 11.4<br>9.2          | 5.9<br>5.3           | 2.4<br>2.2                                               | 2.0<br>2.0                                                                                   | 213  | 44       | FD 56                       | 75                                                       | —<br>—                                                                                     | 350<br>900   | 57       | FA 06                       | 75                                                       | 350<br>900                                                                                 | 223  | 58   |       |  |  |
| 7.5<br>6                         | BN 132MA                                                                            | 2<br>4                 | 2900<br>1430         | 25<br>40     | 82<br>84     | 0.87<br>0.85    | 15.2<br>12.1 | 6.5<br>5.8           | 2.4<br>2.3           | 2.0<br>2.1                                               | 270                                                                                          | 53   | FD 06    | 100                         | —<br>—                                                   | 350<br>900                                                                                 | 66           | FA 07    | 100                         | 350<br>900                                               | 280                                                                                        | 71   |      |       |  |  |
| 9.2<br>7.3                       |                                                                                     | BN 132MB               | 2<br>4               | 2920<br>1440 | 30<br>48     | 83<br>85        | 0.86<br>0.85 | 18.6<br>14.6         | 6.0<br>5.5           | 2.6<br>2.3                                               | 2.2<br>2.1                                                                                   | 319  | 59       | FD 07                       | 150                                                      | —<br>—                                                                                     | 300<br>800   | 75       | FA 07                       | 150                                                      | 300<br>800                                                                                 | 342  | 77   |       |  |  |



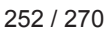
| 2/6P           |                                                                                     |                   |                |          |              |                        |                                  |                                  |                                  |                                      |                                                                                              |        |      | 3000/1000 min <sup>-1</sup> - S3 60/40% |                                      |                                                                                            |      |        |                       |                                      |                                                                                            |      |  |    |  |  |  | 50 Hz      |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------|-------------------------------------------------------------------------------------|-------------------|----------------|----------|--------------|------------------------|----------------------------------|----------------------------------|----------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------|--------|------|-----------------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------|------|--------|-----------------------|--------------------------------------|--------------------------------------------------------------------------------------------|------|--|----|--|--|--|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                |                                                                                     |                   |                |          |              |                        |                                  |                                  |                                  |                                      |                                                                                              |        |      | freno c.c.                              |                                      |                                                                                            |      |        |                       |                                      |                                                                                            |      |  |    |  |  |  | freno c.a. |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                |                                                                                     |                   |                |          |              |                        |                                  |                                  |                                  |                                      |                                                                                              |        |      | FD                                      |                                      |                                                                                            |      |        |                       |                                      |                                                                                            |      |  | FA |  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P <sub>n</sub> |  | n                 | M <sub>n</sub> | η        | cosφ         | I <sub>n</sub><br>400V | I <sub>s</sub><br>I <sub>n</sub> | M <sub>s</sub><br>M <sub>n</sub> | M <sub>a</sub><br>M <sub>n</sub> | J <sub>m</sub><br>x 10 <sup>-4</sup> | IM B5<br> | Mod    | Mb   | Z <sub>o</sub><br>1/h                   | J <sub>m</sub><br>x 10 <sup>-4</sup> | IM B5<br> | Mod  | Mb     | Z <sub>o</sub><br>1/h | J <sub>m</sub><br>x 10 <sup>-4</sup> | IM B5<br> |      |  |    |  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| kW             |                                                                                     | min <sup>-1</sup> | Nm             | %        |              | A                      |                                  |                                  |                                  | kgm <sup>2</sup>                     |           |        | Nm   |                                         | kgm <sup>2</sup>                     |           |      | Nm     |                       | kgm <sup>2</sup>                     |           |      |  |    |  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.25<br>0.08   | BN 71A                                                                              | 2<br>6            | 0.84<br>0.84   | 60<br>43 | 0.82<br>0.70 | 0.73<br>0.38           | 4.3<br>2.1                       | 1.9<br>1.4                       | 1.8<br>1.5                       | 6.9                                  | 5.9                                                                                          | FD 03  | 1.75 | 1500<br>10000                           | 1700<br>13000                        | 8.0                                                                                        | 8.6  | FA 03  | 2.5                   | 1700<br>13000                        | 8.0                                                                                        | 8.3  |  |    |  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.37<br>0.12   | BN 71B                                                                              | 2<br>6            | 1.23<br>1.27   | 62<br>44 | 0.80<br>0.73 | 1.08<br>0.54           | 4.4<br>2.4                       | 1.9<br>1.4                       | 1.8<br>1.5                       | 9.1                                  | 7.3                                                                                          | FD 03  | 3.5  | 1000<br>9000                            | 1300<br>11000                        | 10.2                                                                                       | 10.0 | FA 03  | 3.5                   | 1300<br>11000                        | 10.2                                                                                       | 9.7  |  |    |  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.55<br>0.18   | BN 80A                                                                              | 2<br>6            | 1.88<br>1.85   | 63<br>52 | 0.86<br>0.65 | 1.47<br>0.77           | 4.5<br>3.3                       | 1.9<br>2.0                       | 1.7<br>1.9                       | 20                                   | 9.9                                                                                          | FD 04  | 5.0  | 1500<br>4100                            | 1800<br>6300                         | 22                                                                                         | 13.8 | FA 04  | 5.0                   | 1800<br>6300                         | 22                                                                                         | 13.7 |  |    |  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.75<br>0.25   | BN 80B                                                                              | 2<br>6            | 2.6<br>2.6     | 66<br>54 | 0.87<br>0.67 | 1.89<br>1.00           | 4.3<br>3.2                       | 1.8<br>1.7                       | 1.6<br>1.8                       | 25                                   | 11.3                                                                                         | FD 04  | 5.0  | 1700<br>3800                            | 1900<br>6000                         | 27                                                                                         | 15.2 | FA 04  | 5.0                   | 1900<br>6000                         | 27                                                                                         | 15.1 |  |    |  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.10<br>0.37   | BN 90L                                                                              | 2<br>6            | 3.7<br>3.8     | 67<br>59 | 0.84<br>0.71 | 2.82<br>1.27           | 4.7<br>3.3                       | 2.1<br>1.6                       | 1.9<br>1.6                       | 28                                   | 14.0                                                                                         | FD 05  | 13   | 1400<br>3400                            | 1600<br>5200                         | 32                                                                                         | 20   | FA 05  | 13                    | 1600<br>5200                         | 32                                                                                         | 21   |  |    |  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.5<br>0.55    | BN 100LA                                                                            | 2<br>6            | 5<br>5.6       | 73<br>64 | 0.84<br>0.67 | 3.53<br>1.85           | 5.1<br>3.5                       | 1.9<br>1.7                       | 2.0<br>1.8                       | 40                                   | 18.3                                                                                         | FD 15  | 13   | 1000<br>2900                            | 1200<br>4000                         | 44                                                                                         | 24   | FA 15  | 13                    | 1200<br>4000                         | 44                                                                                         | 25   |  |    |  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2.2<br>0.75    | BN 100LB                                                                            | 2<br>6            | 7.2<br>7.5     | 77<br>67 | 0.85<br>0.64 | 4.9<br>2.5             | 5.9<br>3.3                       | 2.0<br>1.9                       | 1.8<br>1.8                       | 61                                   | 25                                                                                           | FD 15  | 26   | 700<br>2100                             | 900<br>3000                          | 65                                                                                         | 31   | FA 15  | 26                    | 900<br>3000                          | 65                                                                                         | 32   |  |    |  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3<br>1.1       | BN 112M                                                                             | 2<br>6            | 9.9<br>11.1    | 78<br>72 | 0.87<br>0.64 | 6.4<br>3.4             | 6.3<br>3.9                       | 2.0<br>1.8                       | 2.1<br>1.8                       | 98                                   | 30                                                                                           | FD 06S | 40   | —<br>—                                  | 1000<br>2600                         | 107                                                                                        | 40   | FA 06S | 40                    | 1000<br>2600                         | 107                                                                                        | 32   |  |    |  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4.5<br>1.5     | BN 132S                                                                             | 2<br>6            | 14.8<br>14.9   | 78<br>74 | 0.84<br>0.67 | 9.9<br>4.4             | 5.8<br>4.2                       | 1.9<br>1.9                       | 1.8<br>2.0                       | 213                                  | 44                                                                                           | FD 56  | 37   | —<br>—                                  | 500<br>2100                          | 223                                                                                        | 57   | FA 06  | 37                    | 500<br>2100                          | 223                                                                                        | 58   |  |    |  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.5<br>2.2     | BN 132M                                                                             | 2<br>6            | 18.0<br>22     | 78<br>77 | 0.87<br>0.71 | 11.7<br>5.8            | 6.2<br>4.3                       | 2.1<br>2.1                       | 1.9<br>2.0                       | 270                                  | 53                                                                                           | FD 56  | 50   | —<br>—                                  | 400<br>1900                          | 280                                                                                        | 66   | FA 06  | 50                    | 400<br>1900                          | 280                                                                                        | 67   |  |    |  |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |



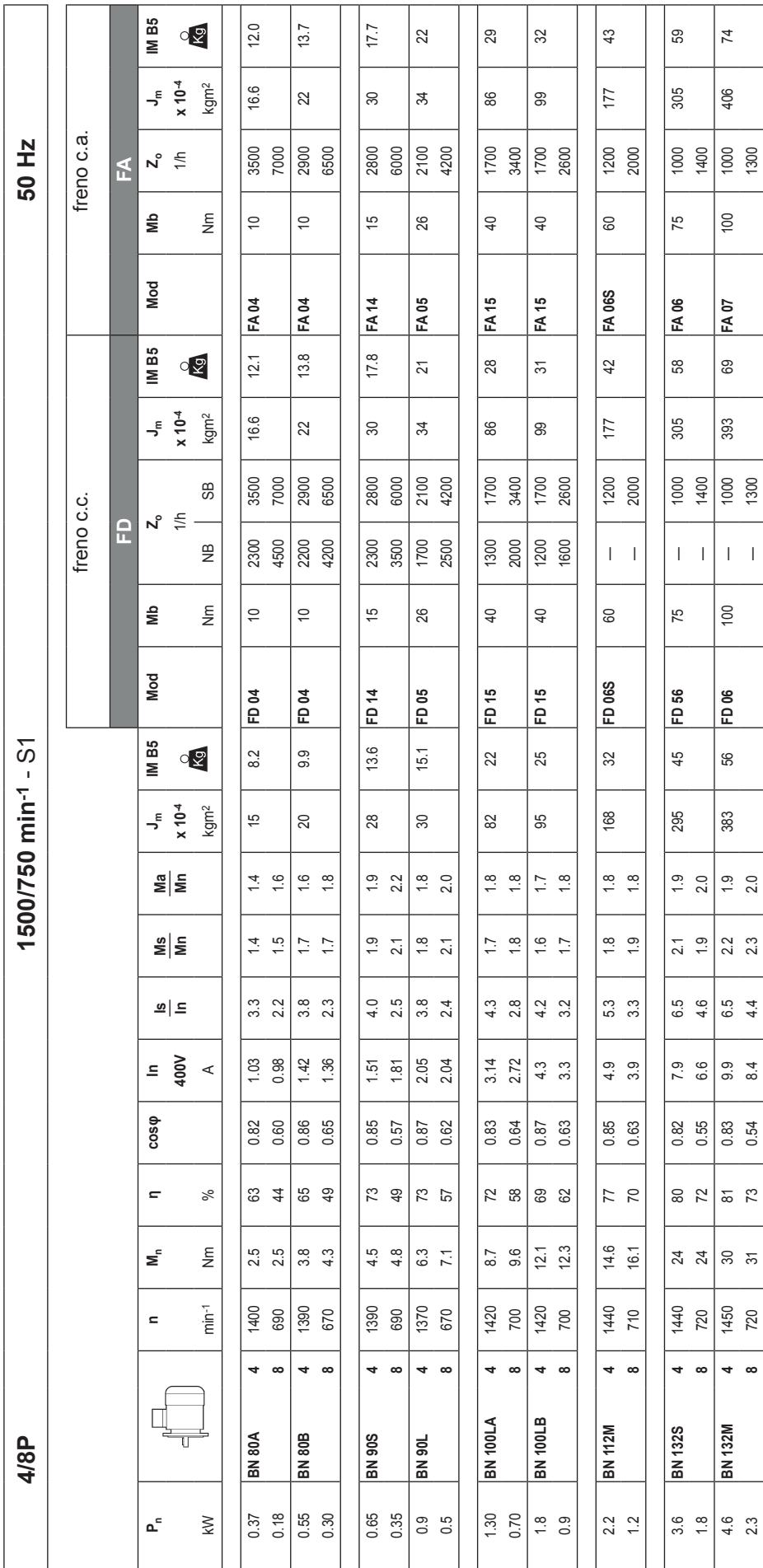
 **Bonfiglioli**  
Riduttori

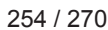


| freno c.c.     |                                                                                     |                   |                |      |      |                        |                   |                   |                   |                                                          |                                                                                              |      | freno c.a. |                       |       |                                                          |                                                                                            |      |        |                       |                                                          |                                                                                            |      |
|----------------|-------------------------------------------------------------------------------------|-------------------|----------------|------|------|------------------------|-------------------|-------------------|-------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------|------|------------|-----------------------|-------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|------|--------|-----------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|------|
| FD             |                                                                                     |                   |                |      |      |                        |                   |                   |                   |                                                          |                                                                                              |      | FA         |                       |       |                                                          |                                                                                            |      |        |                       |                                                          |                                                                                            |      |
| P <sub>n</sub> |  | n                 | M <sub>n</sub> | η    | cosφ | I <sub>n</sub><br>400V | $\frac{I_s}{I_n}$ | $\frac{M_s}{M_n}$ | $\frac{M_a}{M_n}$ | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | Mod  | Mb         | Z <sub>o</sub><br>1/h |       | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | Mod  | Mb     | Z <sub>o</sub><br>1/h | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> |      |
| kW             |                                                                                     | min <sup>-1</sup> | Nm             | %    |      | A                      |                   |                   |                   |                                                          |                                                                                              |      | Nm         | NB                    | SB    |                                                          |                                                                                            |      | Nm     |                       |                                                          |                                                                                            |      |
| 0.55           | BN 80B                                                                              | 2                 | 2820           | 1.86 | 64   | 0.89                   | 1.39              | 4.2               | 1.6               | 1.7                                                      | 25                                                                                           | 11.3 | FD 04      | 5.0                   | 1000  | 1300                                                     | 27                                                                                         | 15.2 | FA 04  | 5.0                   | 1300                                                     | 27                                                                                         | 15.1 |
| 0.09           |                                                                                     | 12                | 430            | 2.0  | 30   | 0.63                   | 0.69              | 1.8               | 1.9               | 1.8                                                      |                                                                                              |      |            | 8000                  | 12000 |                                                          |                                                                                            |      |        | 12000                 |                                                          |                                                                                            |      |
| 0.75           | BN 90L                                                                              | 2                 | 2790           | 2.6  | 56   | 0.89                   | 2.17              | 4.2               | 1.8               | 1.7                                                      | 26                                                                                           | 12.6 | FD 05      | 13                    | 1000  | 1150                                                     | 30                                                                                         | 18.6 | FA 05  | 13                    | 1150                                                     | 30                                                                                         | 19.3 |
| 0.12           |                                                                                     | 12                | 430            | 2.7  | 26   | 0.63                   | 1.06              | 1.7               | 1.4               | 1.6                                                      |                                                                                              |      |            | 4600                  | 6300  |                                                          |                                                                                            |      |        | 6300                  |                                                          |                                                                                            |      |
| 1.10           | BN 100LA                                                                            | 2                 | 2850           | 3.7  | 65   | 0.85                   | 2.87              | 4.5               | 1.6               | 1.8                                                      | 40                                                                                           | 18.3 | FD 15      | 13                    | 700   | 900                                                      | 44                                                                                         | 25   | FA 15  | 13                    | 900                                                      | 44                                                                                         | 25   |
| 0.18           |                                                                                     | 12                | 430            | 4.0  | 26   | 0.54                   | 1.85              | 1.5               | 1.3               | 1.5                                                      |                                                                                              |      |            | 4000                  | 6000  |                                                          |                                                                                            |      |        | 6000                  |                                                          |                                                                                            |      |
| 1.5            | BN 100LB                                                                            | 2                 | 2900           | 4.9  | 67   | 0.86                   | 3.76              | 5.6               | 1.9               | 1.9                                                      | 54                                                                                           | 22   | FD 15      | 13                    | 700   | 900                                                      | 58                                                                                         | 28   | FA 15  | 13                    | 900                                                      | 58                                                                                         | 29   |
| 0.25           |                                                                                     | 12                | 440            | 5.4  | 36   | 0.46                   | 2.18              | 1.8               | 1.7               | 1.8                                                      |                                                                                              |      |            | 3800                  | 5000  |                                                          |                                                                                            |      |        | 5000                  |                                                          |                                                                                            |      |
| 2              | BN 112M                                                                             | 2                 | 2900           | 6.6  | 74   | 0.88                   | 4.43              | 6.5               | 2.1               | 2.0                                                      | 98                                                                                           | 30   | FD 06S     | 20                    | —     | 800                                                      | 107                                                                                        | 40   | FA 06S | 20                    | 800                                                      | 107                                                                                        | 42   |
| 0.3            |                                                                                     | 12                | 460            | 6.2  | 46   | 0.43                   | 2.19              | 2.0               | 2.1               | 2.0                                                      |                                                                                              |      |            | —                     | 3400  |                                                          |                                                                                            |      |        | 3400                  |                                                          |                                                                                            |      |
| 3              | BN 132S                                                                             | 2                 | 2920           | 9.8  | 74   | 0.87                   | 6.7               | 6.8               | 2.3               | 1.9                                                      | 213                                                                                          | 44   | FD 56      | 37                    | —     | 450                                                      | 223                                                                                        | 57   | FA 06  | 37                    | 450                                                      | 223                                                                                        | 58   |
| 0.5            |                                                                                     | 12                | 470            | 10.2 | 51   | 0.43                   | 3.3               | 2.0               | 1.7               | 1.6                                                      |                                                                                              |      |            | —                     | 3000  |                                                          |                                                                                            |      |        | 3000                  |                                                          |                                                                                            |      |
| 4              | BN 132M                                                                             | 2                 | 2920           | 13.1 | 75   | 0.89                   | 8.6               | 5.9               | 2.4               | 2.3                                                      | 270                                                                                          | 53   | FD 56      | 37                    | —     | 400                                                      | 280                                                                                        | 66   | FA 06  | 37                    | 400                                                      | 280                                                                                        | 67   |
| 0.7            |                                                                                     | 12                | 460            | 14.5 | 53   | 0.44                   | 4.3               | 1.9               | 1.7               | 1.6                                                      |                                                                                              |      |            | —                     | 2800  |                                                          |                                                                                            |      |        | 2800                  |                                                          |                                                                                            |      |

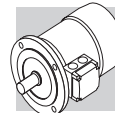


 **Bonfiglioli**  
Riduttori



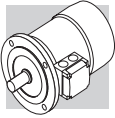


$\bullet = |\mathcal{E}|$



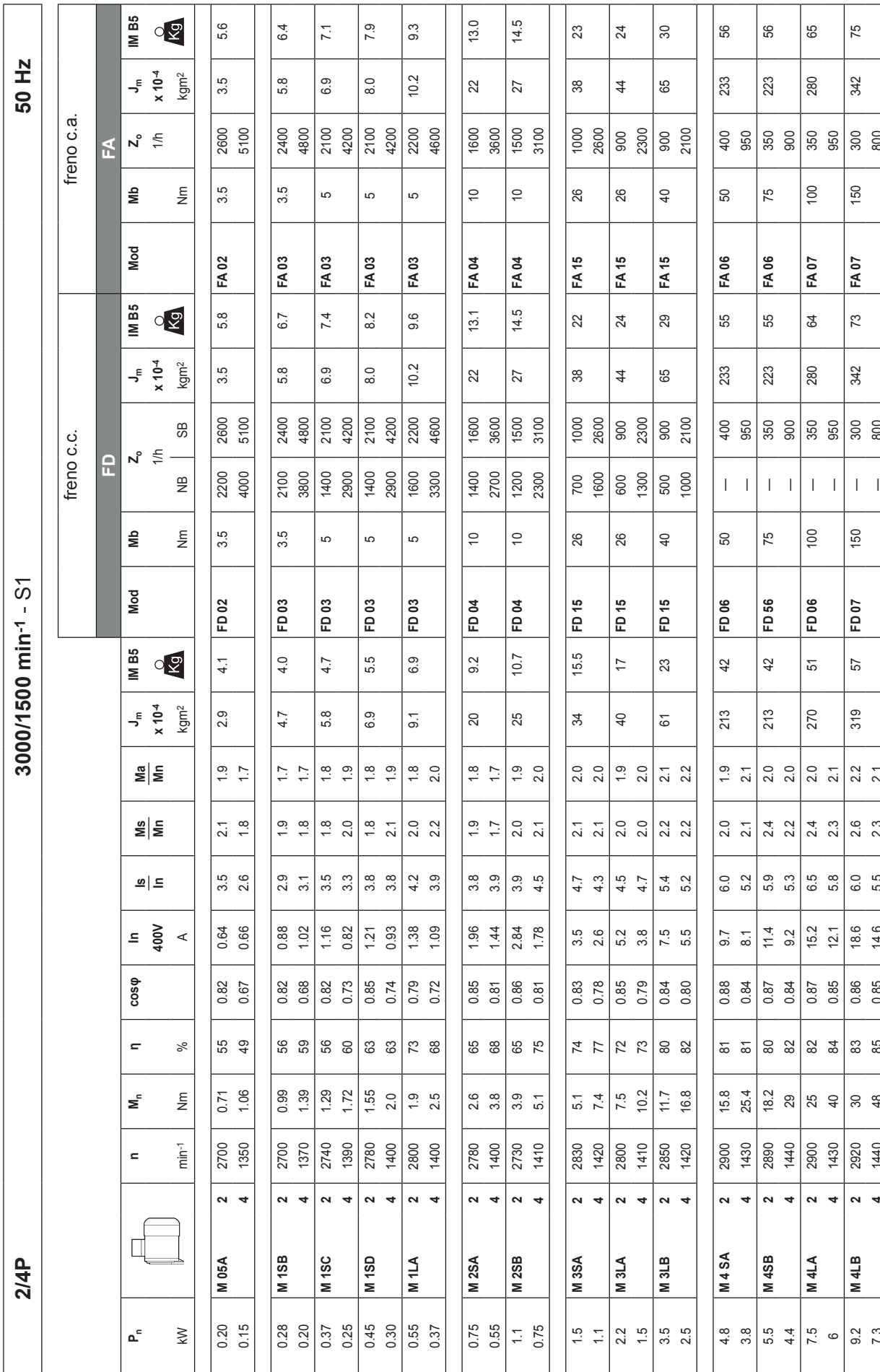
| 4P             |                                                                                     |   |                |      |             |            |            |      |            |          |          |          |                                                          | 1500 min <sup>-1</sup> - S1                                                                 |      |       |                       |       |    |                                                          |                                                                                            |      |       |                       |                                                          |                                                                                            |                | 50 Hz      |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------|-------------------------------------------------------------------------------------|---|----------------|------|-------------|------------|------------|------|------------|----------|----------|----------|----------------------------------------------------------|---------------------------------------------------------------------------------------------|------|-------|-----------------------|-------|----|----------------------------------------------------------|--------------------------------------------------------------------------------------------|------|-------|-----------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                |                                                                                     |   |                |      |             |            |            |      |            |          |          |          |                                                          | freno c.c.                                                                                  |      |       |                       |       |    |                                                          |                                                                                            |      |       |                       |                                                          |                                                                                            |                | freno c.a. |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                |                                                                                     |   |                |      |             |            |            |      |            |          |          |          |                                                          | FD                                                                                          |      |       |                       |       |    |                                                          | FA                                                                                         |      |       |                       |                                                          |                                                                                            |                |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P <sub>n</sub> |  | n | M <sub>n</sub> | IE1  | η<br>(100%) | η<br>(75%) | η<br>(50%) | cosφ | In<br>400V | Is<br>In | Ms<br>Mn | Ma<br>Mn | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | Mod  | Mb    | Z <sub>o</sub><br>1/h | NB    | SB | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | Mod  | Mb    | Z <sub>o</sub><br>1/h | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | P <sub>n</sub> |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.09           | M 0B                                                                                | 4 | 1350           | 0.64 | ○           | 51.7       | 47.6       | 42.9 | 0.60       | 0.42     | 2.6      | 2.5      | 2.4                                                      | 1.5                                                                                         | 2.9  |       |                       |       |    |                                                          |                                                                                            |      |       |                       |                                                          |                                                                                            |                |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.12           | M 05A                                                                               | 4 | 1350           | 0.85 | ○           | 59.8       | 56.2       | 47.0 | 0.62       | 0.47     | 2.6      | 1.9      | 1.8                                                      | 2.0                                                                                         | 3.2  | FD 02 | 1.75                  | 10000 |    |                                                          | 2.6                                                                                        | 4.9  | FA 02 | 1.75                  | 13000                                                    |                                                                                            | 2.6            | 4.7        |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.18           | M 05B                                                                               | 4 | 1320           | 1.30 | ○           | 54.8       | 52.9       | 52.5 | 0.67       | 0.71     | 2.6      | 2.2      | 2.0                                                      | 2.3                                                                                         | 3.6  | FD 02 | 3.5                   | 10000 |    |                                                          | 3.0                                                                                        | 5.3  | FA 02 | 3.5                   | 13000                                                    |                                                                                            | 3.0            | 5.1        |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.25           | M 05C                                                                               | 4 | 1340           | 1.78 | ○           | 65.3       | 65.0       | 57.9 | 0.69       | 0.80     | 2.7      | 2.1      | 1.9                                                      | 3.3                                                                                         | 4.8  | FD 02 | 3.5                   | 7800  |    |                                                          | 3.9                                                                                        | 6.5  | FA 02 | 3.5                   | 10000                                                    |                                                                                            | 3.9            | 6.3        |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.37           | M 1SD                                                                               | 4 | 1370           | 2.6  | ○           | 66.8       | 66.7       | 63.0 | 0.76       | 1.05     | 3.7      | 2.0      | 1.9                                                      | 6.9                                                                                         | 5.5  | FD 03 | 5                     | 6000  |    |                                                          | 8.0                                                                                        | 8.2  | FA 03 | 5                     | 9400                                                     |                                                                                            | 8.0            | 7.9        |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.55           | M 1LA                                                                               | 4 | 1380           | 3.8  | ○           | 69.0       | 68.9       | 68.8 | 0.74       | 1.55     | 4.1      | 2.3      | 2.3                                                      | 9.1                                                                                         | 6.9  | FD 53 | 7.5                   | 4300  |    |                                                          | 10.2                                                                                       | 9.6  | FA 03 | 7.5                   | 8700                                                     |                                                                                            | 10.2           | 9.3        |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.75           | M 2SA                                                                               | 4 | 1400           | 5.1  | ●           | 75.0       | 74.5       | 69.3 | 0.78       | 1.85     | 4.9      | 2.7      | 2.5                                                      | 20                                                                                          | 9.2  | FD 04 | 15                    | 4100  |    |                                                          | 22                                                                                         | 13.1 | FA 04 | 15                    | 7800                                                     |                                                                                            | 22             | 13.0       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.1            | M 2SB                                                                               | 4 | 1400           | 7.5  | ●           | 76.4       | 76.2       | 70.4 | 0.78       | 2.66     | 5.1      | 2.8      | 2.5                                                      | 25                                                                                          | 10.6 | FD 04 | 15                    | 2600  |    |                                                          | 27                                                                                         | 14.5 | FA 04 | 15                    | 5300                                                     |                                                                                            | 27             | 14.4       |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.5            | M 3SA                                                                               | 4 | 1410           | 10.2 | ●           | 79.6       | 80.5       | 79.3 | 0.77       | 3.5      | 4.6      | 2.1      | 2.1                                                      | 34                                                                                          | 15.5 | FD 15 | 26                    | 2800  |    |                                                          | 38                                                                                         | 22   | FA 15 | 26                    | 4900                                                     |                                                                                            | 38             | 23         |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2.2            | M 3LA                                                                               | 4 | 1410           | 14.9 | ●           | 81.1       | 81.4       | 79.9 | 0.75       | 5.2      | 4.5      | 2.2      | 2.0                                                      | 40                                                                                          | 17   | FD 15 | 40                    | 2600  |    |                                                          | 44                                                                                         | 24   | FA 15 | 40                    | 4700                                                     |                                                                                            | 44             | 24         |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3              | M 3LB                                                                               | 4 | 1410           | 20   | ●           | 82.6       | 83.8       | 83.7 | 0.77       | 6.8      | 5.0      | 2.3      | 2.2                                                      | 54                                                                                          | 21   | FD 15 | 40                    | 2400  |    |                                                          | 58                                                                                         | 27   | FA 15 | 40                    | 4400                                                     |                                                                                            | 58             | 28         |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4              | M 3LC                                                                               | 4 | 1400           | 27   | ○           | 82.7       | 83.1       | 80.5 | 0.78       | 9.0      | 4.7      | 2.3      | 2.2                                                      | 61                                                                                          | 23   | FD 55 | 55                    | —     |    |                                                          | 65                                                                                         | 29   | FA 15 | 40                    | 1300                                                     |                                                                                            | 65             | 30         |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.5            | M 4SA                                                                               | 4 | 1440           | 36   | ●           | 84.7       | 84.8       | 82.5 | 0.81       | 11.6     | 5.5      | 2.3      | 2.2                                                      | 213                                                                                         | 42   | FD 56 | 75                    | —     |    |                                                          | 223                                                                                        | 55   | FA 06 | 75                    | 1050                                                     |                                                                                            | 223            | 56         |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7.5            | M 4LA                                                                               | 4 | 1440           | 50   | ●           | 86.0       | 86.3       | 85.3 | 0.81       | 15.5     | 5.7      | 2.5      | 2.4                                                      | 270                                                                                         | 51   | FD 06 | 100                   | —     |    |                                                          | 280                                                                                        | 64   | FA 07 | 100                   | 950                                                      |                                                                                            | 280            | 65         |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9.2            | M 4LB                                                                               | 4 | 1440           | 61   | ●           | 88.4       | 88.6       | 87.5 | 0.81       | 18.8     | 5.9      | 2.7      | 2.5                                                      | 319                                                                                         | 57   | FD 07 | 150                   | —     |    |                                                          | 342                                                                                        | 73   | FA 07 | 150                   | 900                                                      |                                                                                            | 342            | 75         |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11             | M 4LC                                                                               | 4 | 1440           | 73   | ●           | 87.6       | 87.8       | 86.0 | 0.81       | 22.4     | 6.0      | 2.7      | 2.5                                                      | 360                                                                                         | 65   | FD 07 | 150                   | —     |    |                                                          | 382                                                                                        | 81   | FA 07 | 150                   | 850                                                      |                                                                                            | 382            | 83         |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 15             | M 5SB                                                                               | 4 | 1460           | 98   | ●           | 88.7       | 88.5       | 88.4 | 0.81       | 30.1     | 6.0      | 2.3      | 2.1                                                      | 650                                                                                         | 85   | FD 08 | 200                   | —     |    |                                                          | 725                                                                                        | 115  | FA 08 | 200                   | 750                                                      |                                                                                            | 710            | 114        |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 18.5           | M 5LA                                                                               | 4 | 1460           | 121  | ●           | 89.3       | 89.5       | 89.2 | 0.81       | 37       | 6.2      | 2.6      | 2.5                                                      | 790                                                                                         | 101  | FD 08 | 250                   | —     |    |                                                          | 865                                                                                        | 131  | FA 08 | 250                   | 700                                                      |                                                                                            | 850            | 130        |  |  |  |  |  |  |  |  |  |  |  |  |  |

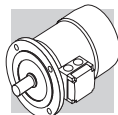
○ = n.a.      ● = IE1



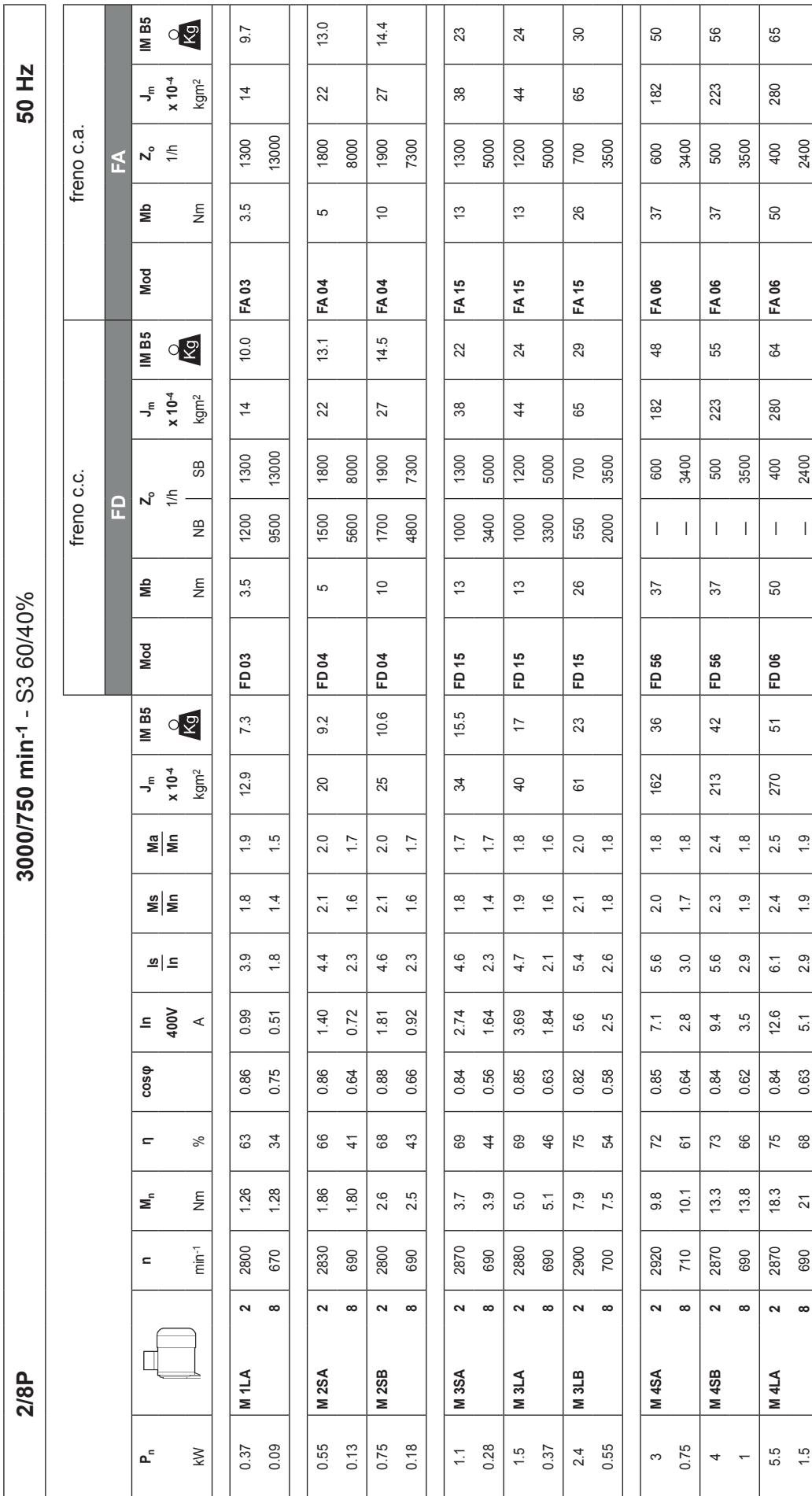
| 6P             |                                                                                     |   |                |     |             |            |            |      |            |          |          |          |                                                          | 1000 min <sup>-1</sup> - S1                                                                  |              |     |                             |       |                                                          |                                                                                            |              |     |                       |                                                          |                                                                                            |  |  | 50 Hz      |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------|-------------------------------------------------------------------------------------|---|----------------|-----|-------------|------------|------------|------|------------|----------|----------|----------|----------------------------------------------------------|----------------------------------------------------------------------------------------------|--------------|-----|-----------------------------|-------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------|-----|-----------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|--|--|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                |                                                                                     |   |                |     |             |            |            |      |            |          |          |          |                                                          | freno c.c.                                                                                   |              |     |                             |       |                                                          |                                                                                            |              |     |                       |                                                          |                                                                                            |  |  | freno c.a. |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                |                                                                                     |   |                |     |             |            |            |      |            |          |          |          |                                                          | FD                                                                                           |              |     |                             |       |                                                          |                                                                                            |              |     |                       |                                                          |                                                                                            |  |  | FA         |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P <sub>n</sub> |  | n | M <sub>n</sub> | IE1 | η<br>(100%) | η<br>(75%) | η<br>(50%) | cosφ | In<br>400V | Is<br>In | Ms<br>Mn | Ma<br>Mn | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | Mod          | Mb  | Z <sub>o</sub><br>1/h<br>NB | Sb    | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | Mod          | Mb  | Z <sub>o</sub><br>1/h | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.09           | <b>M 05A</b>                                                                        | 6 | 0.98           | ○   | 41.0        | 41.0       | 32.9       | 0.53 | 0.60       | 2.1      | 2.1      | 1.8      | 3.4                                                      | 4.3                                                                                          | <b>FD 02</b> | 3.5 | 9000                        | 14000 | 4.0                                                      | 6.0                                                                                        | <b>FA 02</b> | 3.5 | 14000                 | 4.0                                                      | 5.8                                                                                        |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.12           | <b>M 05B</b>                                                                        | 6 | 1.32           | ○   | 45.0        | 44.0       | 41.8       | 0.60 | 0.64       | 2.1      | 1.9      | 1.7      | 3.7                                                      | 4.6                                                                                          | <b>FD 02</b> | 3.5 | 9000                        | 14000 | 4.3                                                      | 6.3                                                                                        | <b>FA 02</b> | 3.5 | 14000                 | 4.3                                                      | 6.1                                                                                        |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.18           | <b>M 15C</b>                                                                        | 6 | 1.91           | ○   | 55.0        | 55.5       | 51.0       | 0.69 | 0.68       | 2.6      | 1.9      | 1.7      | 8.4                                                      | 5.1                                                                                          | <b>FD 03</b> | 5   | 8100                        | 13500 | 9.5                                                      | 7.8                                                                                        | <b>FA 03</b> | 5   | 13500                 | 9.5                                                      | 7.5                                                                                        |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.25           | <b>M 15D</b>                                                                        | 6 | 2.7            | ○   | 62.0        | 58.5       | 51.4       | 0.71 | 0.82       | 2.6      | 1.9      | 1.7      | 10.9                                                     | 6.3                                                                                          | <b>FD 03</b> | 5   | 7800                        | 13000 | 12                                                       | 9.0                                                                                        | <b>FA 03</b> | 5   | 13000                 | 12                                                       | 8.7                                                                                        |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.37           | <b>M 1LA</b>                                                                        | 6 | 3.9            | ○   | 66.0        | 60.0       | 53.3       | 0.69 | 1.17       | 3.0      | 2.4      | 2.0      | 12.9                                                     | 7.3                                                                                          | <b>FD 53</b> | 7.5 | 5100                        | 9500  | 14                                                       | 10.0                                                                                       | <b>FA 03</b> | 7.5 | 9500                  | 14                                                       | 9.7                                                                                        |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.55           | <b>M 25A</b>                                                                        | 6 | 5.7            | ○   | 70.0        | 69.8       | 64.3       | 0.68 | 1.67       | 3.9      | 2.6      | 2.2      | 25                                                       | 10.6                                                                                         | <b>FD 04</b> | 15  | 4800                        | 7200  | 27                                                       | 14.5                                                                                       | <b>FA 04</b> | 15  | 7200                  | 27                                                       | 14.4                                                                                       |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.75           | <b>M 25B</b>                                                                        | 6 | 7.8            | ●   | 70.0        | 70.0       | 64.4       | 0.65 | 2.38       | 3.8      | 2.5      | 2.2      | 28                                                       | 11.5                                                                                         | <b>FD 04</b> | 15  | 3400                        | 6400  | 30                                                       | 15.4                                                                                       | <b>FA 04</b> | 15  | 6400                  | 30                                                       | 15.3                                                                                       |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.1            | <b>M 35A</b>                                                                        | 6 | 11.4           | ●   | 75.0        | 74.0       | 72.0       | 0.72 | 2.9        | 4.3      | 2.0      | 1.8      | 33                                                       | 17                                                                                           | <b>FD 15</b> | 26  | 2700                        | 5000  | 37                                                       | 23                                                                                         | <b>FA 15</b> | 26  | 5000                  | 37                                                       | 24                                                                                         |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.5            | <b>M 3LA</b>                                                                        | 6 | 15.2           | ●   | 75.2        | 74.2       | 70.3       | 0.72 | 4.0        | 4.1      | 2.1      | 2.0      | 82                                                       | 21                                                                                           | <b>FD 15</b> | 40  | 1900                        | 4100  | 86                                                       | 27                                                                                         | <b>FA 15</b> | 40  | 4100                  | 86                                                       | 28                                                                                         |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.85           | <b>M 3LB</b>                                                                        | 6 | 19.0           | ●   | 76.6        | 72.8       | 62.6       | 0.73 | 4.8        | 4.6      | 2.1      | 2.0      | 95                                                       | 23                                                                                           | <b>FD 15</b> | 40  | 1700                        | 3600  | 99                                                       | 29                                                                                         | <b>FA 15</b> | 40  | 3600                  | 99                                                       | 30                                                                                         |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2.2            | <b>M 3LC</b>                                                                        | 6 | 23             | ●   | 77.7        | 76.8       | 72.4       | 0.71 | 5.8        | 4.7      | 2.3      | 2.1      | 95                                                       | 23                                                                                           | <b>FD 55</b> | 55  | —                           | 1900  | 99                                                       | 29                                                                                         | <b>FA 15</b> | 40  | 1900                  | 99                                                       | 30                                                                                         |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3              | <b>M 45A</b>                                                                        | 6 | 30             | ●   | 79.7        | 77.0       | 75.1       | 0.76 | 7.1        | 5.1      | 1.9      | 1.8      | 216                                                      | 34                                                                                           | <b>FD 56</b> | 75  | —                           | 1400  | 226                                                      | 47                                                                                         | <b>FA 06</b> | 75  | 1400                  | 226                                                      | 48                                                                                         |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4              | <b>M 4LA</b>                                                                        | 6 | 40             | ●   | 81.4        | 81.5       | 79.5       | 0.77 | 9.2        | 5.5      | 2.0      | 1.8      | 295                                                      | 43                                                                                           | <b>FD 06</b> | 100 | —                           | 1200  | 305                                                      | 56                                                                                         | <b>FA 07</b> | 100 | 1200                  | 305                                                      | 57                                                                                         |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.5            | <b>M 4LB</b>                                                                        | 6 | 56             | ●   | 83.1        | 80.9       | 79.1       | 0.78 | 12.2       | 6.1      | 2.1      | 1.9      | 383                                                      | 54                                                                                           | <b>FD 07</b> | 150 | —                           | 1050  | 406                                                      | 70                                                                                         | <b>FA 07</b> | 150 | 1050                  | 406                                                      | 72                                                                                         |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7.5            | <b>M 55A</b>                                                                        | 6 | 75             | ●   | 85.0        | 85.0       | 84.8       | 0.81 | 15.7       | 5.9      | 2.2      | 2.0      | 740                                                      | 69                                                                                           | <b>FD 08</b> | 170 | —                           | 900   | 815                                                      | 98                                                                                         | <b>FA 08</b> | 170 | 900                   | 800                                                      | 98                                                                                         |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11             | <b>M 55B</b>                                                                        | 6 | 109            | ●   | 86.4        | 86.5       | 85.9       | 0.81 | 22.7       | 6.6      | 2.5      | 2.3      | 970                                                      | 89                                                                                           | <b>FD 08</b> | 200 | —                           | 800   | 1045                                                     | 119                                                                                        | <b>FA 08</b> | 200 | 800                   | 1030                                                     | 118                                                                                        |  |  |            |  |  |  |  |  |  |  |  |  |  |  |  |  |

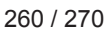
○ = n.a.      ● = IE1



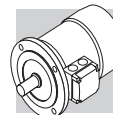


| 2/6P           |                                                                                     |                   |                |    |      |                        |                                  |                                  |                                  |                                                          |                                                                                              |       |      | 3000/1000 min <sup>-1</sup> - S3 60/40% |       |                       |      |                                                          |                                                                                            |                  |                                                                                   |       |                       |      |      |  |  | 50 Hz      |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
|----------------|-------------------------------------------------------------------------------------|-------------------|----------------|----|------|------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------|-------|------|-----------------------------------------|-------|-----------------------|------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------|-----------------------------------------------------------------------------------|-------|-----------------------|------|------|--|--|------------|--|------------------|-----------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|
|                |                                                                                     |                   |                |    |      |                        |                                  |                                  |                                  |                                                          |                                                                                              |       |      | freno c.c.                              |       |                       |      |                                                          |                                                                                            |                  |                                                                                   |       |                       |      |      |  |  | freno c.a. |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| P <sub>n</sub> |  | n                 | M <sub>n</sub> | η  | cosφ | I <sub>n</sub><br>400V | I <sub>s</sub><br>I <sub>n</sub> | M <sub>s</sub><br>M <sub>n</sub> | M <sub>a</sub><br>M <sub>n</sub> | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | Mod   | Mb   | FD                                      |       |                       |      | J <sub>m</sub><br>x 10 <sup>-4</sup><br>kgm <sup>2</sup> | IM B5<br> | FA               |                                                                                   |       |                       |      |      |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
|                |                                                                                     |                   |                |    |      |                        |                                  |                                  |                                  |                                                          |                                                                                              |       |      | Mod                                     | Mb    | Z <sub>o</sub><br>1/h | NB   |                                                          |                                                                                            | SB               | Mod                                                                               | Mb    | Z <sub>o</sub><br>1/h |      |      |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| kW             |                                                                                     | min <sup>-1</sup> | Nm             | %  |      | A                      |                                  |                                  |                                  | kgm <sup>2</sup>                                         |           |       | Nm   |                                         |       |                       |      |                                                          |                                                                                            | kgm <sup>2</sup> |  |       | Nm                    |      |      |  |  |            |  | kgm <sup>2</sup> |  |  |  |  |  |  |  |  |  |  |  |
| 0.25           | M 1SA                                                                               | 2                 | 2850           | 60 | 0.82 | 0.73                   | 4.3                              | 1.9                              | 1.8                              | 6.9                                                      | 5.5                                                                                          | FD 03 | 1.75 | 1500                                    | 1700  | 1700                  | 8.0  | 8.2                                                      | FA 03                                                                                      | 1.75             | 1700                                                                              | 13000 | 1700                  | 8.0  | 7.9  |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 0.08           | 6                                                                                   | 910               | 0.84           | 43 | 0.70 | 0.38                   | 2.1                              | 1.4                              | 1.5                              |                                                          |                                                                                              |       |      | 10000                                   | 13000 | 13000                 |      |                                                          |                                                                                            |                  | 13000                                                                             |       |                       |      |      |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 0.37           | M 1LA                                                                               | 2                 | 2880           | 62 | 0.80 | 1.08                   | 4.4                              | 1.9                              | 1.8                              | 9.1                                                      | 6.9                                                                                          | FD 03 | 3.5  | 1000                                    | 1300  | 1300                  | 10.2 | 9.6                                                      | FA 03                                                                                      | 3.5              | 1300                                                                              | 11000 | 1300                  | 10.2 | 9.3  |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 0.12           | 6                                                                                   | 900               | 1.27           | 44 | 0.73 | 0.54                   | 2.4                              | 1.4                              | 1.5                              |                                                          |                                                                                              |       |      | 9000                                    | 11000 | 11000                 |      |                                                          |                                                                                            |                  | 11000                                                                             |       |                       |      |      |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 0.55           | M 2SA                                                                               | 2                 | 2800           | 63 | 0.86 | 1.47                   | 4.5                              | 1.9                              | 1.7                              | 20                                                       | 9.2                                                                                          | FD 04 | 5    | 1500                                    | 1800  | 1800                  | 22   | 13.1                                                     | FA 04                                                                                      | 5                | 1800                                                                              |       | 1800                  | 22   | 13.0 |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 0.18           | 6                                                                                   | 930               | 1.85           | 52 | 0.65 | 0.77                   | 3.3                              | 2.0                              | 1.9                              |                                                          |                                                                                              |       |      | 4100                                    | 6300  | 6300                  |      |                                                          |                                                                                            |                  | 6300                                                                              |       |                       |      |      |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 0.75           | M 2SB                                                                               | 2                 | 2800           | 66 | 0.87 | 1.89                   | 4.3                              | 1.8                              | 1.6                              | 25                                                       | 10.6                                                                                         | FD 04 | 5    | 1700                                    | 1900  | 1900                  | 27   | 14.5                                                     | FA 04                                                                                      | 5                | 1900                                                                              |       | 1900                  | 27   | 14.4 |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 0.25           | 6                                                                                   | 930               | 2.6            | 54 | 0.67 | 1.00                   | 3.2                              | 1.7                              | 1.8                              |                                                          |                                                                                              |       |      | 3800                                    | 6000  | 6000                  |      |                                                          |                                                                                            |                  | 6000                                                                              |       |                       |      |      |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 1.1            | M 3SA                                                                               | 2                 | 2870           | 71 | 0.82 | 2.73                   | 4.9                              | 1.8                              | 1.9                              | 34                                                       | 15.5                                                                                         | FD 15 | 13   | 1000                                    | 1300  | 1300                  | 38   | 22                                                       | FA 15                                                                                      | 13               | 1300                                                                              |       | 1300                  | 38   | 23   |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 0.37           | 6                                                                                   | 930               | 3.8            | 63 | 0.70 | 1.21                   | 3.1                              | 1.5                              | 1.8                              |                                                          |                                                                                              |       |      | 3500                                    | 5000  | 5000                  |      |                                                          |                                                                                            |                  | 5000                                                                              |       |                       |      |      |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 1.5            | M 3LA                                                                               | 2                 | 2880           | 73 | 0.84 | 3.53                   | 5.1                              | 1.9                              | 2.0                              | 40                                                       | 17                                                                                           | FD 15 | 13   | 1000                                    | 1200  | 1200                  | 44   | 24                                                       | FA 15                                                                                      | 13               | 1200                                                                              |       | 1200                  | 44   | 24   |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 0.55           | 6                                                                                   | 940               | 5.6            | 64 | 0.67 | 1.85                   | 3.5                              | 1.7                              | 1.8                              |                                                          |                                                                                              |       |      | 2900                                    | 4000  | 4000                  |      |                                                          |                                                                                            |                  | 4000                                                                              |       |                       |      |      |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 2.2            | M 3LB                                                                               | 2                 | 2900           | 77 | 0.85 | 4.9                    | 5.9                              | 2.0                              | 2.0                              | 61                                                       | 23                                                                                           | FD 15 | 26   | 700                                     | 900   | 900                   | 65   | 29                                                       | FA 15                                                                                      | 26               | 900                                                                               |       | 900                   | 65   | 30   |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 0.75           | 6                                                                                   | 950               | 7.5            | 67 | 0.64 | 2.5                    | 3.3                              | 1.9                              | 1.8                              |                                                          |                                                                                              |       |      | 2100                                    | 3000  | 3000                  |      |                                                          |                                                                                            |                  | 3000                                                                              |       |                       |      |      |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 3              | M 4SA                                                                               | 2                 | 2910           | 74 | 0.88 | 6.6                    | 5.6                              | 2.0                              | 2.1                              | 170                                                      | 36                                                                                           | FD 56 | 37   | —                                       | 600   | 600                   | 182  | 48                                                       | FA 06                                                                                      | 37               | 600                                                                               |       | 600                   | 182  | 50   |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 1.1            | 6                                                                                   | 960               | 10.9           | 73 | 0.68 | 3.2                    | 4.5                              | 2.2                              | 2.0                              |                                                          |                                                                                              |       |      | —                                       | 2200  | 2200                  |      |                                                          |                                                                                            |                  | 2200                                                                              |       |                       |      |      |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 4.5            | M 4SB                                                                               | 2                 | 2910           | 78 | 0.84 | 9.9                    | 5.8                              | 1.9                              | 1.8                              | 213                                                      | 42                                                                                           | FD 56 | 37   | —                                       | 500   | 500                   | 223  | 55                                                       | FA 06                                                                                      | 37               | 500                                                                               |       | 500                   | 223  | 56   |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 1.5            | 6                                                                                   | 960               | 14.9           | 74 | 0.67 | 4.4                    | 4.2                              | 1.9                              | 2.0                              |                                                          |                                                                                              |       |      | —                                       | 2100  | 2100                  |      |                                                          |                                                                                            |                  | 2100                                                                              |       |                       |      |      |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 5.5            | M 4LA                                                                               | 2                 | 2920           | 78 | 0.87 | 11.7                   | 6.2                              | 2.1                              | 1.9                              | 270                                                      | 51                                                                                           | FD 06 | 50   | —                                       | 400   | 400                   | 280  | 64                                                       | FA 06                                                                                      | 50               | 400                                                                               |       | 400                   | 280  | 65   |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 2.2            | 6                                                                                   | 960               | 22             | 77 | 0.71 | 5.8                    | 4.3                              | 2.1                              | 2.0                              |                                                          |                                                                                              |       |      | —                                       | 1900  | 1900                  |      |                                                          |                                                                                            |                  | 1900                                                                              |       |                       |      |      |  |  |            |  |                  |                                                                                   |  |  |  |  |  |  |  |  |  |  |



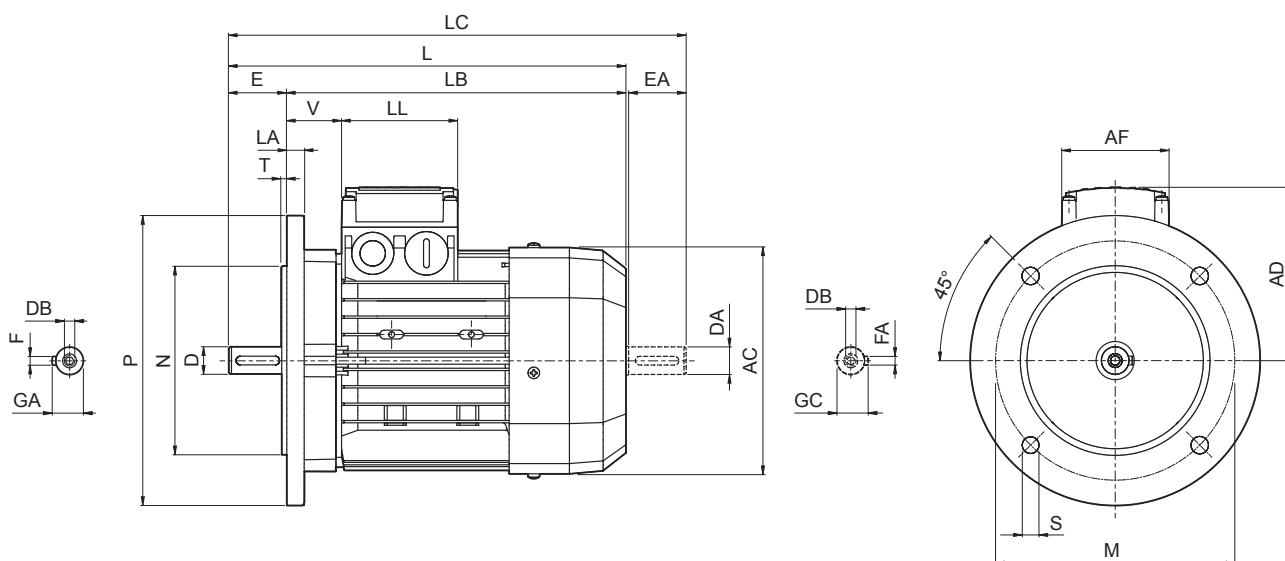


 **Bonfiglioli**  
Riduttori



## M11 DIMENSIONI MOTORI

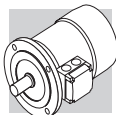
### BN - IM B5



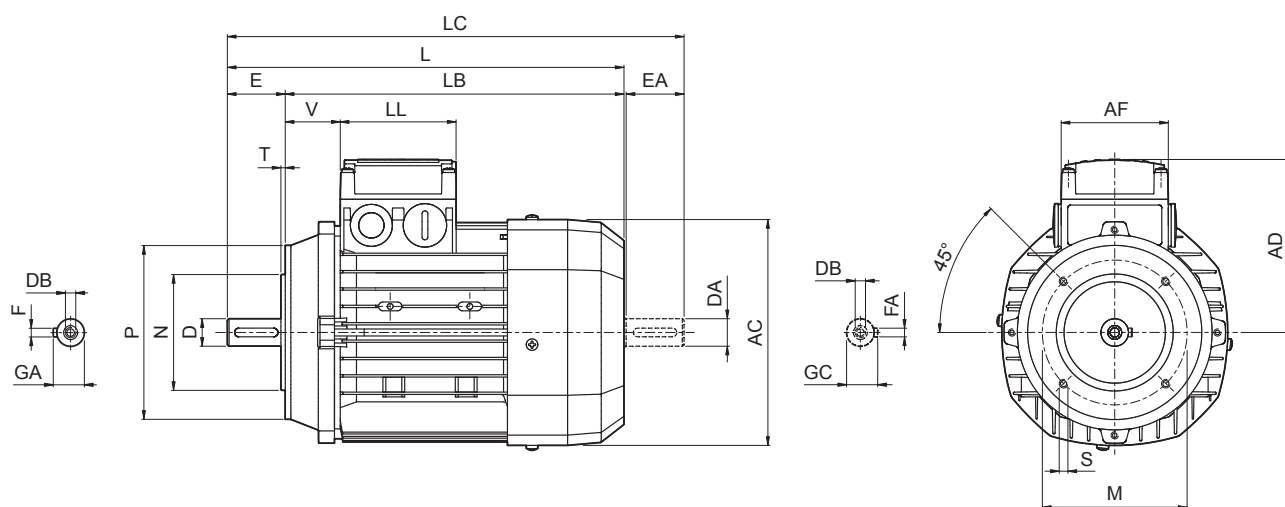
|           | Albero                  |                           |                           |                           |                           | Flangia |     |     |      |     |                         | Motore |     |     |     |     |     |     |     |  |
|-----------|-------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------|-----|-----|------|-----|-------------------------|--------|-----|-----|-----|-----|-----|-----|-----|--|
|           | D<br>DA                 | E<br>EA                   | DB                        | GA<br>GC                  | F<br>FA                   | M       | N   | P   | S    | T   | LA                      | AC     | L   | LB  | LC  | AD  | AF  | LL  | V   |  |
| BN 56     | 9                       | 20                        | M3                        | 10.2                      | 3                         | 100     | 80  | 120 | 7    | 3   | 8                       | 110    | 185 | 165 | 207 | 91  | 74  | 80  | 34  |  |
| BN 63     | 11                      | 23                        | M4                        | 12.5                      | 4                         | 115     | 95  | 140 | 9.5  |     | 10                      | 121    | 207 | 184 | 232 | 95  |     |     | 26  |  |
| BN 71     | 14                      | 30                        | M5                        | 16                        | 5                         | 130     | 110 | 160 |      |     |                         | 138    | 249 | 219 | 281 | 108 |     |     | 37  |  |
| BN 80     | 19                      | 40                        | M6                        | 21.5                      | 6                         | 165     | 130 | 200 | 11.5 | 3.5 | 11.5                    | 156    | 274 | 234 | 315 | 119 | 98  | 98  | 38  |  |
| BN 90     | 24                      | 50                        | M8                        | 27                        | 8                         |         |     |     |      |     |                         | 176    | 326 | 276 | 378 | 133 |     |     | 44  |  |
| BN 100    | 28                      | 60                        | M10                       | 31                        |                           | 215     | 180 | 250 | 14   | 4   | 14                      | 195    | 367 | 307 | 429 | 142 |     |     | 50  |  |
| BN 112    |                         |                           |                           |                           | 15                        |         |     |     |      |     | 219                     | 385    | 325 | 448 | 157 | 52  |     |     |     |  |
| BN 132    | 38                      | 80                        | M12                       | 41                        | 10                        | 265     | 230 | 300 |      |     | 20                      | 258    | 493 | 413 | 576 | 193 | 118 | 118 | 58  |  |
| BN 160 MR | 42<br>38 <sup>(1)</sup> | 110<br>80 <sup>(1)</sup>  | M16<br>M12 <sup>(1)</sup> | 45<br>41 <sup>(1)</sup>   | 12<br>10 <sup>(1)</sup>   | 300     | 250 | 350 | 18.5 | 5   | 562                     |        | 452 | 645 | 245 |     |     |     | 218 |  |
| BN 160 M  |                         |                           |                           |                           |                           |         |     |     |      |     | 15                      | 310    | 596 | 486 | 680 | 261 | 51  |     |     |  |
| BN 160 L  |                         |                           |                           |                           |                           |         |     |     |      |     |                         | 310    | 640 | 530 | 724 |     |     |     |     |  |
| BN 180 M  | 48<br>38 <sup>(1)</sup> | 110<br>110 <sup>(1)</sup> | M16<br>M16 <sup>(1)</sup> | 51.5<br>41 <sup>(1)</sup> | 14<br>10 <sup>(1)</sup>   | 350     | 300 | 400 | 18   | 348 | 708                     | 598    | 823 | 261 | 187 | 187 | 52  |     |     |  |
| BN 180 L  | 48<br>42 <sup>(1)</sup> |                           |                           | M16<br>M16 <sup>(1)</sup> | 51.5<br>45 <sup>(1)</sup> |         |     |     |      |     | 14<br>12 <sup>(1)</sup> | 722    | 612 |     |     |     | 837 | 66  |     |  |
| BN 200 L  | 55<br>42 <sup>(1)</sup> |                           |                           | M20<br>M16 <sup>(1)</sup> | 59<br>45 <sup>(1)</sup>   |         |     |     |      |     | 16<br>12 <sup>(1)</sup> |        |     |     |     |     |     |     |     |  |

N.B.:

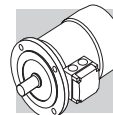
1) Queste dimensioni sono riferite alla seconda estremità d'albero.



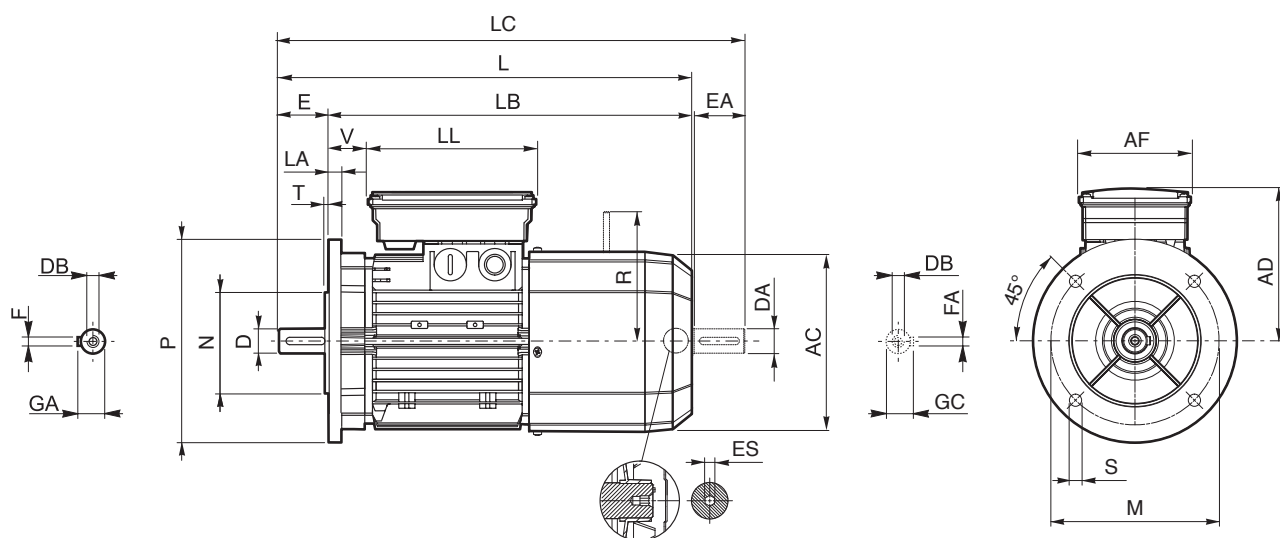
## BN - IM B14



|        | Albero  |         |     |          |         | Flangia |     |     |     |     | Motore |     |     |     |     |     |     |     |
|--------|---------|---------|-----|----------|---------|---------|-----|-----|-----|-----|--------|-----|-----|-----|-----|-----|-----|-----|
|        | D<br>DA | E<br>EA | DB  | GA<br>GC | F<br>FA | M       | N   | P   | S   | T   | AC     | L   | LB  | LC  | AD  | AF  | LL  | V   |
| BN 56  | 9       | 20      | M3  | 10.2     | 3       | 65      | 50  | 80  | M5  | 2.5 | 110    | 185 | 165 | 207 | 91  | 74  | 80  | 34  |
| BN 63  | 11      | 23      | M4  | 12.5     | 4       | 75      | 60  | 90  |     |     | 121    | 207 | 184 | 232 | 95  |     |     | 26  |
| BN 71  | 14      | 30      | M5  | 16       | 5       | 85      | 70  | 105 | M6  |     | 138    | 249 | 219 | 281 | 108 |     |     | 37  |
| BN 80  | 19      | 40      | M6  | 21.5     | 6       | 100     | 80  | 120 |     | 3   | 156    | 274 | 234 | 315 | 119 | 38  |     |     |
| BN 90  | 24      | 50      | M8  | 27       | 8       | 115     | 95  | 140 | M8  |     | 176    | 326 | 276 | 378 | 133 | 98  | 98  | 44  |
| BN 100 | 28      | 60      | M10 | 31       |         | 130     | 110 | 160 |     |     | 3.5    | 195 | 367 | 307 | 429 |     |     | 142 |
| BN 112 |         |         |     |          |         |         |     |     | 219 | 385 |        | 325 | 448 | 157 | 52  |     |     |     |
| BN 132 | 38      | 80      | M12 | 41       | 10      | 165     | 130 | 200 | M10 | 4   | 258    | 493 | 413 | 576 | 193 | 118 | 118 | 58  |



## BN\_FD ; IM B5



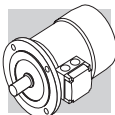
|           | Albero                  |                           |                           |                           |                         | Flangia |     |     |                         |     |      | Motore |     |     |     |     |     |     |     |                    |     |
|-----------|-------------------------|---------------------------|---------------------------|---------------------------|-------------------------|---------|-----|-----|-------------------------|-----|------|--------|-----|-----|-----|-----|-----|-----|-----|--------------------|-----|
|           | D<br>DA                 | E<br>EA                   | DB                        | GA<br>GC                  | F<br>FA                 | M       | N   | P   | S                       | T   | LA   | AC     | L   | LB  | LC  | AD  | AF  | LL  | V   | R                  | ES  |
| BN 63     | 11                      | 23                        | M4                        | 12.5                      | 4                       | 115     | 95  | 140 | 9.5                     | 3   | 10   | 121    | 272 | 249 | 297 | 122 | 98  | 133 | 14  | 96                 | 5   |
| BN 71     | 14                      | 30                        | M5                        | 16                        | 5                       | 130     | 110 | 160 | 9.5                     | 3.5 |      | 138    | 310 | 280 | 342 | 135 |     |     | 25  | 103                |     |
| BN 80     | 19                      | 40                        | M6                        | 21.5                      | 6                       | 165     | 130 | 200 | 11.5                    |     | 11.5 | 156    | 346 | 306 | 388 | 146 |     |     | 41  | 129                |     |
| BN 90 S   | 24                      | 50                        | M8                        | 27                        | 8                       |         |     |     |                         | 149 |      | 110    | 165 | 39  | 160 |     |     |     |     |                    |     |
| BN 90 L   |                         |                           |                           |                           |                         |         |     |     |                         |     | 146  |        |     |     |     |     |     |     |     |                    |     |
| BN 100    | 28                      | 60                        | M10                       | 31                        | 215                     | 180     | 250 | 14  | 4                       | 14  | 195  | 458    | 398 | 521 | 158 | 165 | 62  | 160 |     |                    |     |
| BN 112    |                         |                           |                           |                           |                         |         |     |     |                         | 15  | 219  | 484    | 424 | 547 | 173 |     |     |     | 165 | 73                 | 199 |
| BN 132    | 38                      | 80                        | M12                       | 41                        | 10                      | 265     | 230 | 300 | 14                      | 4   | 20   | 258    | 603 | 523 | 686 | 210 | 140 | 188 | 46  | 204 <sup>(2)</sup> | —   |
| BN 160 MR | 42<br>38 <sup>(1)</sup> | 110<br>80 <sup>(1)</sup>  | M16<br>M12 <sup>(1)</sup> | 45<br>41 <sup>(1)</sup>   | 12<br>10 <sup>(1)</sup> | 300     | 250 | 350 |                         |     | 18.5 |        | 5   | 15  | 672 |     |     |     | 562 | 755                |     |
| BN 160 M  |                         |                           |                           |                           |                         |         |     |     | 42<br>38 <sup>(1)</sup> | 310 |      | 736    |     |     | 626 | 820 | 51  | 266 |     |                    |     |
| BN 160 L  | 48<br>38 <sup>(1)</sup> |                           |                           | 780                       | 670                     |         |     |     |                         |     |      | 864    |     | 305 |     |     |     |     |     |                    |     |
| BN 180 M  | 48<br>42 <sup>(1)</sup> | 110<br>110 <sup>(1)</sup> | M16<br>M16 <sup>(1)</sup> | 51.5<br>45 <sup>(1)</sup> | 14<br>12 <sup>(1)</sup> | 350     | 300 | 400 | 18.5                    | 18  | 348  | 866    | 756 |     | 981 | 261 | 52  | 305 |     |                    |     |
| BN 180 L  |                         |                           |                           |                           |                         |         |     |     |                         |     |      | 878    | 768 | 993 |     |     |     |     |     |                    |     |
| BN 200 L  | 55<br>42 <sup>(1)</sup> |                           | M20<br>M16 <sup>(1)</sup> | 59<br>45 <sup>(1)</sup>   | 16<br>12 <sup>(1)</sup> |         |     |     |                         |     |      |        |     |     |     |     |     | 64  |     |                    |     |

N.B.:

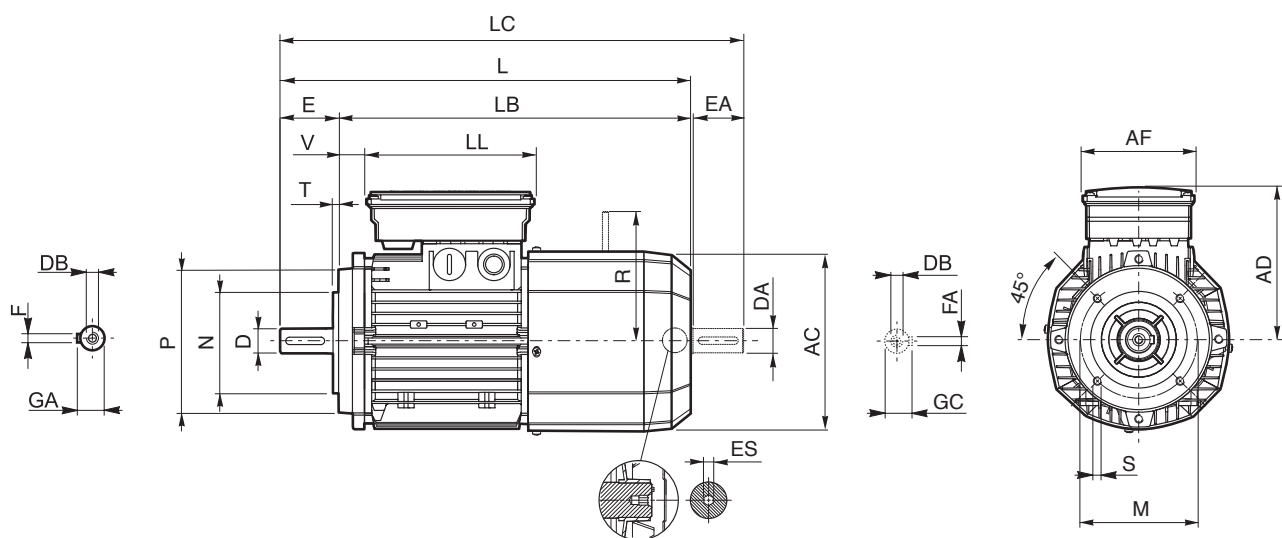
1) Queste dimensioni sono riferite alla seconda estremità d'albero.

2) Per freno FD07 quota R=226.

L'esagono ES non è presente con l'opzione PS.



## BN\_FD ; IM B14

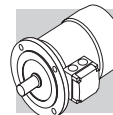


|         | Albero  |         |     |          |         | Flangia |     |     |     |     | Motore |     |     |                    |     |     |     |    |                    |    |
|---------|---------|---------|-----|----------|---------|---------|-----|-----|-----|-----|--------|-----|-----|--------------------|-----|-----|-----|----|--------------------|----|
|         | D<br>DA | E<br>EA | DB  | GA<br>GC | F<br>FA | M       | N   | P   | S   | T   | AC     | L   | LB  | LC                 | AD  | AF  | LL  | V  | R                  | ES |
| BN 63   | 11      | 23      | M4  | 12.5     | 4       | 75      | 60  | 90  | M5  | 2.5 | 121    | 272 | 249 | 297                | 122 | 98  | 133 | 14 | 96                 | 5  |
| BN 71   | 14      | 30      | M5  | 16       | 5       | 85      | 70  | 105 | M6  |     | 138    | 310 | 280 | 342                | 135 |     |     | 25 | 103                |    |
| BN 80   | 19      | 40      | M6  | 21.5     | 6       | 100     | 80  | 120 |     |     | 156    | 346 | 306 | 388                | 146 |     |     | 41 | 129                |    |
| BN 90 S | 24      | 50      | M8  | 27       | 8       | 115     | 95  | 140 | M8  | 3   | 176    | 409 | 359 | 461                | 149 | 110 | 165 | 39 | 129                | 6  |
| BN 90 L |         |         |     |          |         | 195     | 458 | 398 |     |     | 521    | 158 | 62  | 160                |     |     |     |    |                    |    |
| BN 100  | 28      | 60      | M10 | 31       |         | 130     | 110 | 160 |     | 3.5 | 219    | 484 | 424 | 547                | 173 |     |     | 73 | 199                |    |
| BN 112  |         |         |     |          |         | 258     | 603 | 523 |     |     | 686    | 210 | 46  | 204 <sup>(1)</sup> |     |     |     |    |                    |    |
| BN 132  | 38      | 80      | M12 | 41       | 10      | 165     | 130 | 200 | M10 | 4   | 258    | 603 | 523 | 686                | 210 | 140 | 188 | 46 | 204 <sup>(1)</sup> |    |

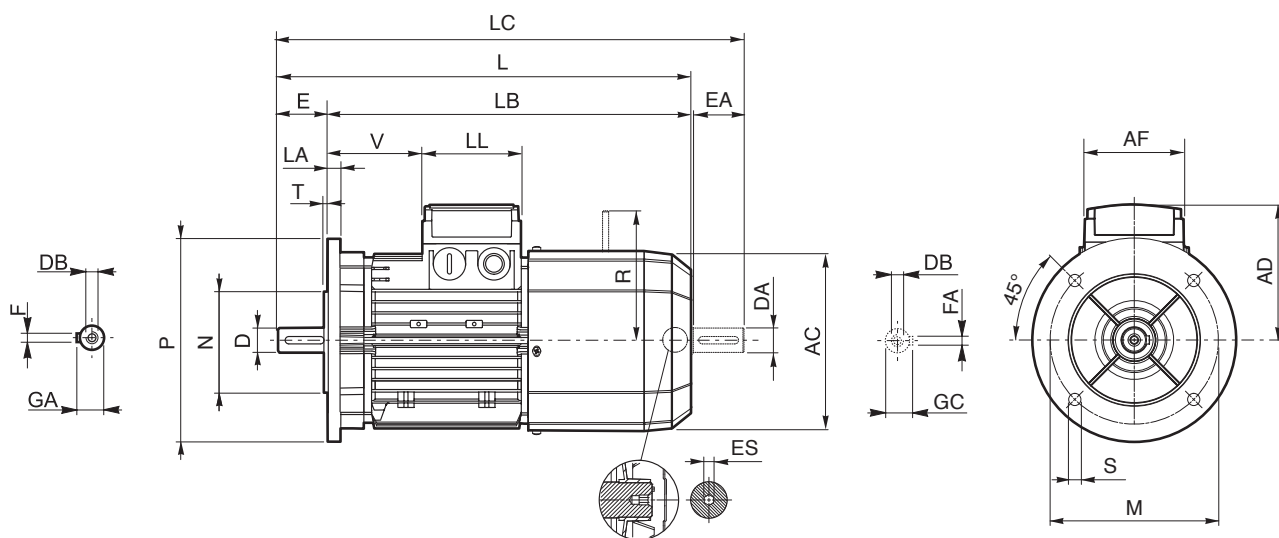
N.B.:

1) Per freno FD07 quota R=226.

L'esagono ES non è presente con l'opzione PS.



## BN\_FA - IM B5



|           | Albero                  |                          |                           |                           |                         | Flangia |     |     |      |      |     | Motore |      |     |     |     |     |     |     |                    |     |     |
|-----------|-------------------------|--------------------------|---------------------------|---------------------------|-------------------------|---------|-----|-----|------|------|-----|--------|------|-----|-----|-----|-----|-----|-----|--------------------|-----|-----|
|           | D<br>DA                 | E<br>EA                  | DB                        | GA<br>GC                  | F<br>FA                 | M       | N   | P   | S    | T    | LA  | AC     | L    | LB  | LC  | AD  | AF  | LL  | V   | R                  | ES  |     |
| BN 63     | 11                      | 23                       | M4                        | 12.5                      | 4                       | 115     | 95  | 140 | 9.5  | 3    | 10  | 121    | 272  | 249 | 297 | 95  | 74  | 80  | 26  | 116                | 5   |     |
| BN 71     | 14                      | 30                       | M5                        | 16                        | 5                       | 130     | 110 | 160 |      | 138  |     | 310    | 280  | 342 | 108 | 68  |     |     | 124 |                    |     |     |
| BN 80     | 19                      | 40                       | M6                        | 21.5                      | 6                       | 165     | 130 | 200 |      | 11.5 |     | 3.5    | 11.5 | 156 | 346 | 306 |     |     | 388 | 119                |     | 83  |
| BN 90     | 24                      | 50                       | M8                        | 27                        | 8                       |         |     |     | 215  |      | 180 |        |      | 250 | 14  | 4   | 176 | 409 | 359 | 461                | 133 | 95  |
| BN 100    | 28                      | 60                       | M10                       | 31                        |                         | 14      | 195 | 458 |      | 398  |     | 521    | 142  |     |     |     | 98  | 98  | 119 | 128                | 198 |     |
| BN 112    |                         |                          |                           | 15                        |                         | 219     | 484 | 424 |      | 547  |     | 157    |      |     |     |     |     |     |     |                    |     |     |
| BN 132    | 38                      | 80                       | M12                       | 41                        | 10                      | 265     | 230 | 300 | 18.5 | 5    | 15  | 258    | 603  | 523 | 686 | 210 | 140 | 188 | 46  | 200 <sup>(2)</sup> | —   |     |
| BN 160 MR | 42<br>38 <sup>(1)</sup> | 110<br>80 <sup>(1)</sup> | M16<br>M12 <sup>(1)</sup> | 45<br>41 <sup>(1)</sup>   | 12<br>10 <sup>(1)</sup> | 300     | 250 | 350 |      |      |     |        | 672  | 562 | 755 | 193 | 118 | 118 | 218 | 217                |     |     |
| BN 160 M  |                         |                          |                           |                           |                         |         |     |     |      |      |     |        | 310  | 736 | 626 | 820 | 245 | 187 | 187 | 51                 |     | 247 |
| BN 160 L  |                         |                          |                           |                           |                         |         |     |     |      |      |     |        |      | 780 | 670 | 864 |     |     |     |                    |     |     |
| BN 180 M  | 48<br>38 <sup>(1)</sup> |                          |                           | 51.5<br>41 <sup>(1)</sup> | 14<br>10 <sup>(1)</sup> |         |     |     |      |      |     |        | 780  | 670 | 864 |     |     |     |     |                    |     |     |

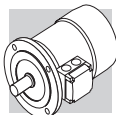
N.B.:

1) Queste dimensioni sono riferite alla seconda estremità d'albero.

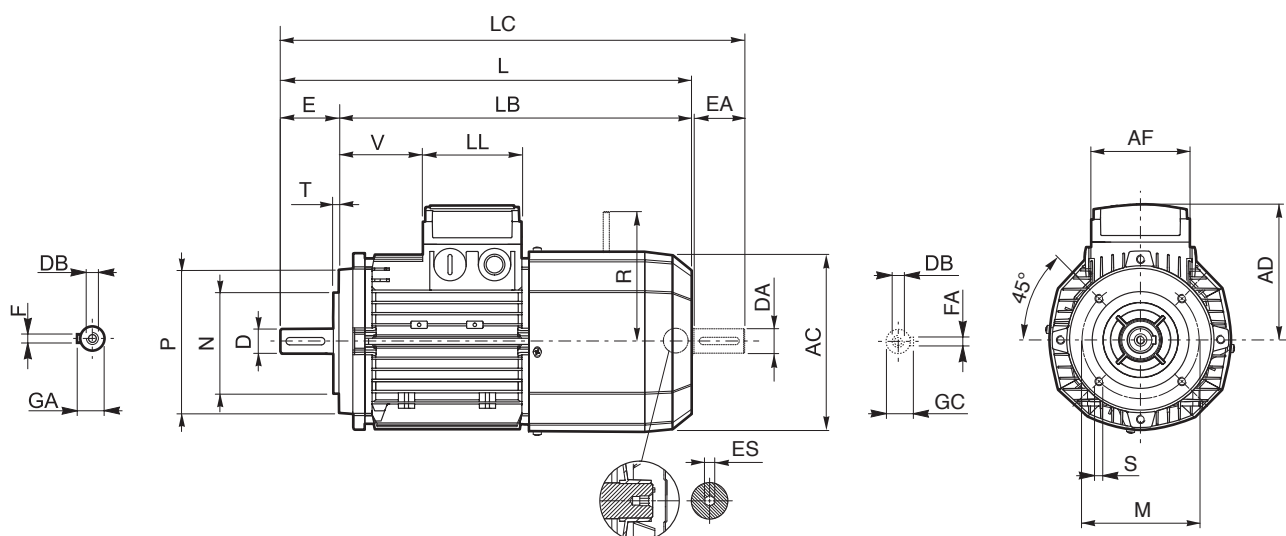
2) Per freno FA07 quota R=217.

Le dimensioni AD, AF, LL e V relative alla scatola morsettiera dei motori BN...FA dotati di alimentazione separata del freno (opzione SA) coincidono con quelle dei motori BN...FD di pari taglia.

L'esagono ES non è presente con l'opzione PS.



## BN\_FA - IM B14



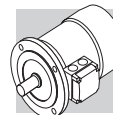
|        | Albero  |         |     |          |         | Flangia |     |     |     |     | Motore |     |     |     |     |     |     |    |                    |     |
|--------|---------|---------|-----|----------|---------|---------|-----|-----|-----|-----|--------|-----|-----|-----|-----|-----|-----|----|--------------------|-----|
|        | D<br>DA | E<br>EA | DB  | GA<br>GC | F<br>FA | M       | N   | P   | S   | T   | AC     | L   | LB  | LC  | AD  | AF  | LL  | V  | R                  | ES  |
| BN 63  | 11      | 23      | M4  | 12.5     | 4       | 75      | 60  | 90  | M5  | 2.5 | 121    | 272 | 249 | 119 | 95  | 74  | 80  | 26 | 116                | 5   |
| BN 71  | 14      | 30      | M5  | 16       | 5       | 85      | 70  | 105 | M6  |     | 138    | 310 | 280 | 342 | 108 |     |     | 68 | 124                |     |
| BN 80  | 19      | 40      | M6  | 21.5     | 6       | 100     | 80  | 120 |     | 3   | 156    | 346 | 306 | 388 | 119 |     |     | 83 | 134                |     |
| BN 90  | 24      | 50      | M8  | 27       | 8       | 115     | 95  | 140 | M8  |     | 4      | 176 | 409 | 359 | 461 | 133 | 98  | 98 | 95                 | 160 |
| BN 100 | 28      | 60      | M10 | 31       |         | 130     | 110 | 160 |     | 3.5 |        | 195 | 458 | 398 | 521 | 142 |     |    | 119                |     |
| BN 112 |         |         |     |          |         |         |     |     |     |     | 219    | 484 | 424 | 547 | 157 | 128 |     |    | 198                |     |
| BN 132 | 38      | 80      | M12 | 41       | 10      | 165     | 130 | 200 | M10 | 4   | 258    | 603 | 523 | 686 | 210 | 140 | 188 | 46 | 200 <sup>(1)</sup> |     |

N.B.:

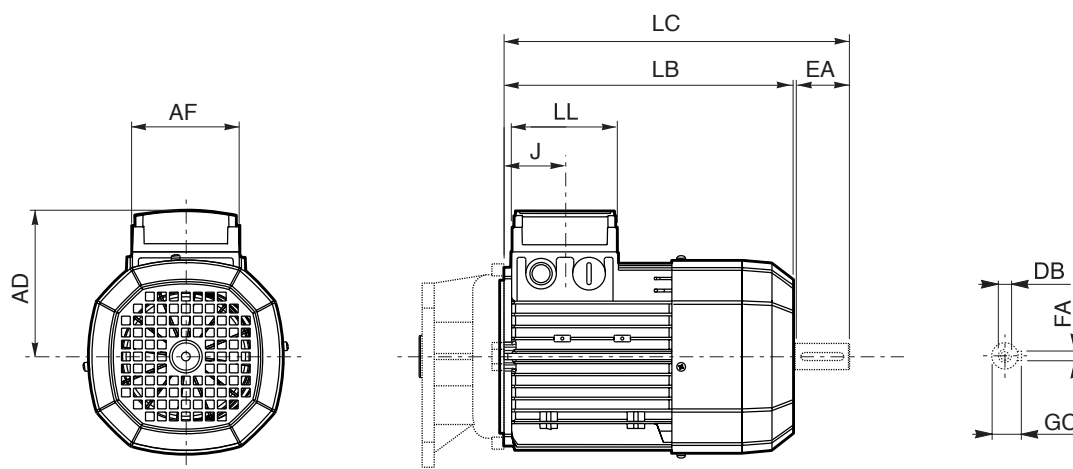
1) Per freno FA07 quota R=217.

Le dimensioni AD, AF, LL e V relative alla scatola morsettiera dei motori BN...FA dotati di alimentazione separata del freno (opzione SA) coincidono con quelle dei motori BN...FD di pari taglia.

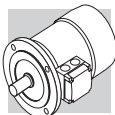
L'esagono ES non è presente con l'opzione PS.



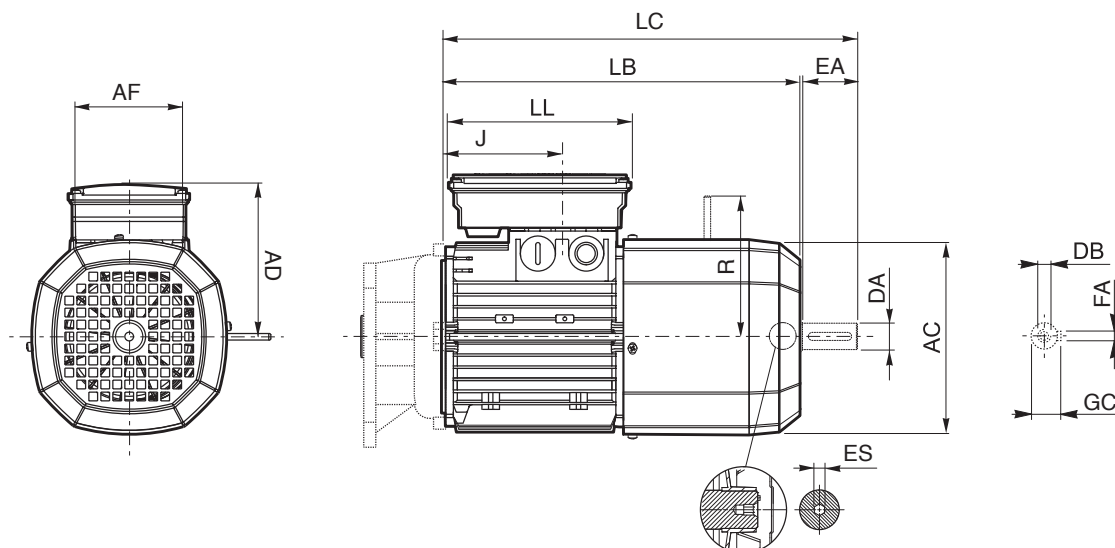
# M



|               | Seconda estremità albero |    |     |    |      | Motore |     |     |     |     |      |     |
|---------------|--------------------------|----|-----|----|------|--------|-----|-----|-----|-----|------|-----|
|               | DA                       | EA | DB  | FA | GC   | AC     | LB  | LC  | AF  | LL  | J    | AD  |
| <b>M 0</b>    | 9                        | 20 | M3  | 3  | 10.2 | 110    | 133 | 155 | 74  | 80  | 42   | 91  |
| <b>M 05</b>   | 11                       | 23 | M4  | 4  | 12.5 | 121    | 165 | 191 |     |     | 48   | 95  |
| <b>M 1</b>    | 14                       | 30 | M5  | 5  | 16   | 138    | 187 | 219 |     |     | 45   | 108 |
| <b>M 2 S</b>  | 19                       | 40 | M6  | 6  | 21.5 | 156    | 202 | 245 |     |     | 44   | 119 |
| <b>M 3 S</b>  | 28                       | 60 | M10 | 8  | 31   | 195    | 230 | 293 | 98  | 98  | 53.5 | 142 |
| <b>M 3 L</b>  |                          |    |     |    |      |        | 262 | 325 |     |     |      |     |
| <b>M 4</b>    | 38                       | 80 | M12 | 10 | 41   | 258    | 361 | 444 | 118 | 118 | 64.5 | 193 |
| <b>M 4 LC</b> |                          |    |     |    |      |        | 396 | 479 |     |     |      |     |
| <b>M 5 S</b>  |                          |    |     |    |      | 310    | 418 | 502 | 187 | 187 | 77   | 245 |
| <b>M 5 L</b>  |                          |    |     |    |      |        | 462 | 546 |     |     |      |     |



## M\_FD

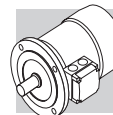


|               | Seconda estremità albero |    |     |    |      | Motore |     |     |     |     |       |     |         |    |
|---------------|--------------------------|----|-----|----|------|--------|-----|-----|-----|-----|-------|-----|---------|----|
|               | DA                       | EA | DB  | FA | GC   | AC     | LB  | LC  | AF  | LL  | J     | AD  | R       | ES |
| <b>M 05</b>   | 11                       | 23 | M4  | 4  | 12.5 | 121    | 231 | 256 | 98  | 133 | 48    | 122 | 96      | 5  |
| <b>M 1</b>    | 14                       | 30 | M5  | 5  | 16   | 138    | 248 | 280 |     |     | 73    | 135 | 103     |    |
| <b>M 2 S</b>  | 19                       | 40 | M6  | 6  | 21.5 | 156    | 272 | 314 |     |     | 88    | 146 | 129     |    |
| <b>M 3 S</b>  | 28                       | 60 | M10 | 8  | 31   | 195    | 326 | 389 | 110 | 165 | 124.5 | 158 | 160     | 6  |
| <b>M 3 L</b>  |                          |    |     |    |      |        | 353 | 416 |     |     |       |     |         |    |
| <b>M 4</b>    | 38                       | 80 | M12 | 10 | 41   | 258    | 470 | 553 | 140 | 188 | 185.5 | 210 | 204 (1) |    |
| <b>M 4 LC</b> |                          |    |     |    |      |        | 495 | 578 |     |     | 64.5  |     | 226     |    |
| <b>M 5 S</b>  |                          |    |     |    |      | 310    | 558 | 642 | 187 | 187 | 77    | 245 | 266     | —  |
| <b>M 5 L</b>  |                          |    |     |    |      |        | 602 | 686 |     |     |       |     |         |    |

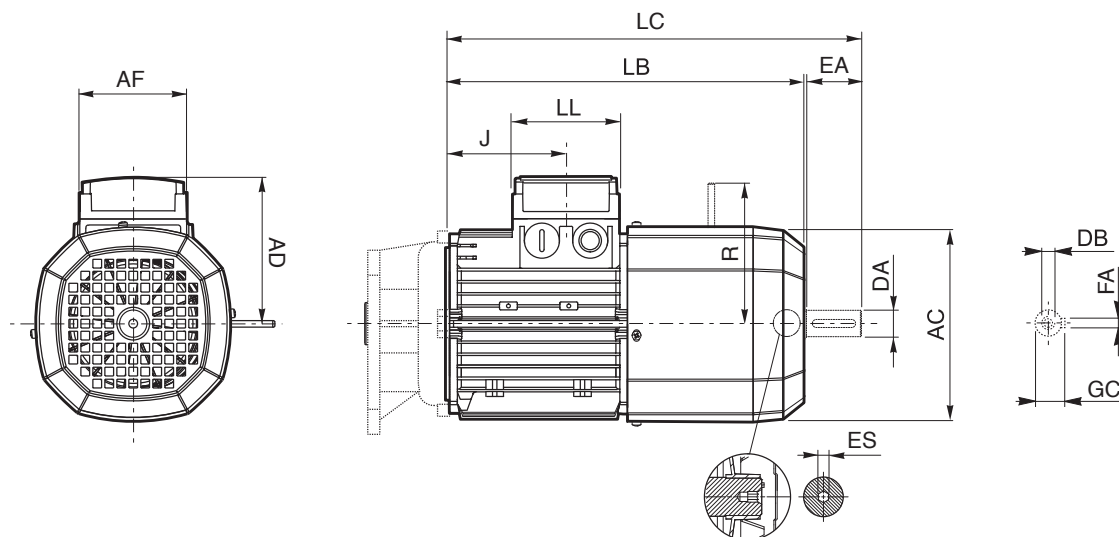
N.B.:

1) Per freno FD07 quota R=226.

L'esagono ES non è presente con l'opzione PS.



## M\_FA



|        | Seconda estremità albero |    |     |    |      | Motore |     |     |     |     |       |     |         |    |   |
|--------|--------------------------|----|-----|----|------|--------|-----|-----|-----|-----|-------|-----|---------|----|---|
|        | DA                       | EA | DB  | FA | GC   | AC     | LB  | LC  | AF  | LL  | J     | AD  | R       | ES |   |
| M 05   | 11                       | 23 | M4  | 4  | 12.5 | 121    | 231 | 256 | 74  | 80  | 48    | 95  | 116     | 5  |   |
| M 1    | 14                       | 30 | M5  | 5  | 16   | 138    | 248 | 280 |     |     | 73    | 108 | 124     |    |   |
| M 2 S  | 19                       | 40 | M6  | 6  | 21.5 | 156    | 272 | 314 |     |     | 88    | 119 | 134     |    |   |
| M 3 S  | 28                       | 60 | M10 | 8  | 31   | 195    | 326 | 389 | 98  | 98  | 124.5 | 142 | 160     | 6  |   |
| M 3 L  |                          |    |     |    |      |        | 353 | 416 |     |     |       |     |         |    |   |
| M 4    | 38                       | 80 | M14 | 10 | 41   | 258    | 470 | 553 | 140 | 188 | 185.5 | 210 | 200 (1) |    |   |
| M 4 LC |                          |    |     |    |      |        | 495 | 578 |     |     | 64.5  |     | 217     |    |   |
| M 5 S  |                          |    | M12 |    |      | 310    | 558 | 642 | 187 | 187 | 77    | 245 | 247     |    | — |
| M 5 L  |                          |    |     |    |      |        | 602 | 686 |     |     |       |     |         |    |   |

N.B.:

1) Per freno FA07 quota R=217.

Le dimensioni AD, AF, LL e V relative alla scatola morsettiera dei motori M...FA dotati di alimentazione separata del freno (opzione SA) coincidono con quelle dei motori M...FD di pari taglia

L'esagono ES non è presente con l'opzione PS.



## INDICE DI REVISIONE

| BR_CAT_VFW_STD_ITA_R11_5                                                          |                                                                                        |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|  | Descrizione                                                                            |
| 97                                                                                | Aggiornato tabella "Predisposizioni motore" per i riduttori VF/VF 30/44 e VF/VF 30/49. |
| 111                                                                               | Corretto caratteristiche motore elettrico BN27.                                        |
| 138...141                                                                         | Corretto dimensione foro di fissaggio riduttori W110.                                  |
| 141                                                                               | Corretto dimensioni riduttori VF/W 49/110.                                             |
| 185                                                                               | Corretto dimensioni riduttori VF 44L e VF 49L.                                         |

2024 05 29

Questa pubblicazione annulla e sostituisce ogni precedente edizione o revisione. Ci riserviamo il diritto di apportare modifiche senza preavviso. È vietata la produzione anche parziale senza autorizzazione.





Abbiamo un inflessibile dedizione per l'eccellenza, l'innovazione e la sostenibilità. Il nostro Team crea, distribuisce e supporta soluzioni di trasmissione e controllo di potenza per mantenere il mondo in movimento.

#### HEADQUARTERS

**Bonfiglioli S.p.A**

**Sede legale:** Via Cav. Clementino Bonfiglioli, 1  
40012 Calderara di Reno - Bologna (Italy)  
Tel. +39 051 6473111

**Sede operativa:** Via Isonzo, 65/67/69  
40033 Casalecchio di Reno - Bologna (Italy)

