ACTIVE

210/410 Series

Premium frequency inverters

Bonfiglioli

We engineer dreams

TABLE OF CONTENT

THE HIGHEST LEVEL OF PRECISION, EFFICIENCY AND ENERGY OPTIMIZATION

With more than 20 years of experience in creating tailored and forward-thinking motion control systems, Bonfiglioli has proven to be a reliable partner as **one-stop shop for mechatronic applications** in industrial automation.
Bonfiglioli engineering specialists work side by side with customers to develop dedicated integrated solutions, covering the entire motion drive train according to an **Industry 4.0 approach**.
Thanks to the extensive know-how and the long-term collaboration with key customers, our centers of excellence develop **breakthrough mechatronic innovations**, including low backlash planetary gearboxes, servomotors, open-loop and closed loop inverters, servo drives and energy regenerative units.

This, combined with a comprehensive range of **Professional Services**, enables us to respond to customers' requests by:

- providing **user friendly, plug & play solutions**
- **increasing** applications' **efficiency** and **productivity**
- designing **flexible, modular solutions** targeted to a wide range of applications
- granting access to real time data for **diagnostic, maintenance** and **predictive analytics**

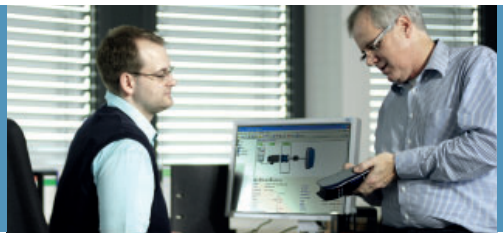
FULLY COMMITTED TO THE EFFICIENCY

Bonfiglioli technical sales experts support customers with a proactive, flexible and dedicated approach **throughout the system's entire life cycle**.

- **Assessment and recommendation**: our team provides support starting from the very early stage of the project by assessing the requirements and developing a targeted analysis of the application, guiding customers in the choice of the most suitable components for their drive solution.
- **Engineering and planning**: our experts work with customers to co-engineer their application, offering consultancy in sizing, fine tuning and selecting the optimized drive train, always considering life cycle cost optimization.
- **Installation and commissioning**: we partner with our customers to ensure a quick, cost-effective and successful installation, optimizing the benefits and functions of their drive technology.
- **Retrofit and upgrade**: we update customers' machines with state-of-the-art technology to ensure constant levels of productivity, reliability and performance.
- **Maintenance and repair**: we work side by side with customers to avoid failures, reduce down times and ensure the best system operation.

A COMPLETE INTEGRATED SOLUTION FOR ALL INDUSTRIAL APPLICATIONS

Our engineering specialists **work side by side with customers** to create the most effective solution, whether the request is to optimize an existing machine or to develop a new one. Our relationship with customers is based on an **active partnership** with fast decision-making processes to develop individually tailored offers.
Our full-range and modular offering provides the necessary products for the development of vertically integrated solutions in **a variety of sectors**, such as material handling, automated storage, textile and packaging. Our team of experts assists customers in designing cost effective and energy efficient machines, aligning performance to meet the specific requirements.



A COMPLETE INTEGRATED SOLUTION

- Precision Planetary Gearboxes
- Industrial Gearboxes
- Permanent Magnet Synchronous Motors
- Synchronous Reluctance Motors
- Asynchronous Motors
- Servo Drives
- Frequency Inverters
- Energy Regenerative Inverters
- Motion Control
- Industry 4.0 solutions

INDUSTRY SECTOR EXPERTISE

- MATERIAL HANDLING
- HOIST & CRANES
- FOOD & BEVERAGE
- AUTOMATED WAREHOUSE
- PACKAGING
- TEXTILES
- MATERIAL WORKING

BONFIGLIOLI DIGITAL TOOLS

Thanks to a powerful set of **software tools** and **online platforms**, developed through partnerships with the main market leaders, Bonfiglioli enables its customers to **engineer tailored applications** in a smooth and productive way: the components selection and sizing, as well as the design of the whole motion drive train, are made simpler and more reliable.

In addition, thanks to its in-depth knowledge of industrial solutions, **Bonfiglioli engineering team is ready to assist customers** in their selection and design process, providing high quality technical support for specific application developments.

SERVOSOFT

DEVELOP OPTIMIZED SOLUTIONS

Bonfiglioli and SERVOsoft® work together to **support customers in sizing complete multi-axis servo systems**, including motors, gearboxes and servodrives with 15 mechanisms and up to 50 axes in a shared bus or standalone configuration.

With the Bonfiglioli products available on SERVOsoft, customers are able to select, dimension and design their customized and high performance applications.

In addition, the Bonfiglioli engineering team uses the high level servosizing tool SERVOsoft® to provide a **top level customer support** service by developing **optimized**, **energy-efficient** and **tailored engineering solutions** to meet individual needs.

SHOP

PRODUCT CONFIGURATION AND ORDER ASSISTANT

Bonfiglioli's **complete e-business system** guides customers, distributors and agents through the process of **selecting the right product** for their specific needs, and provides support for **design activities** and **order management**, greatly accelerating the selection and ordering process and improving accuracy.

Thanks to this web-based technology, customers can get in touch with Bonfiglioli technical service any time from anywhere around the world.

EPLAN

ENHANCE YOUR ELECTRICAL DESIGN

Bonfiglioli and EPLAN work together to **provide efficient engineering solutions**, aimed at reducing the gap between the initial concept and its development, programming and commissioning, thanks to:

- Always up-to-date device data and documentation
- Easy drag and drop function to develop optimized electrical drawings

BONFIGLIOLI FREQUENCY INVERTERS AND SERVO DRIVES

The right solution for a wide spectrum of applications

Our wide portfolio of frequency inverters and servo drives provides customers across a variety of sectors with **unprecedent levels of flexibility**, thanks to:

- the compatibility with a wide range of motors types
- scalable control performances from basic to demanding applications
- wide power range (from 0.25 to 1,200 kW)
- extensive input/output connectivity
- the support of major fieldbus protocols.

Whether in the textile industry, packaging, material working, automated storage or other sectors, our frequency inverters and servo drives are **optimized for numerous applications**.

Our team of experts constantly works with the aim of providing **innovative and highly performant solutions**, introducing continuous improvements in terms of better control of your processes, lower energy consumption, improved productivity and user experience.

Highest energy efficiency

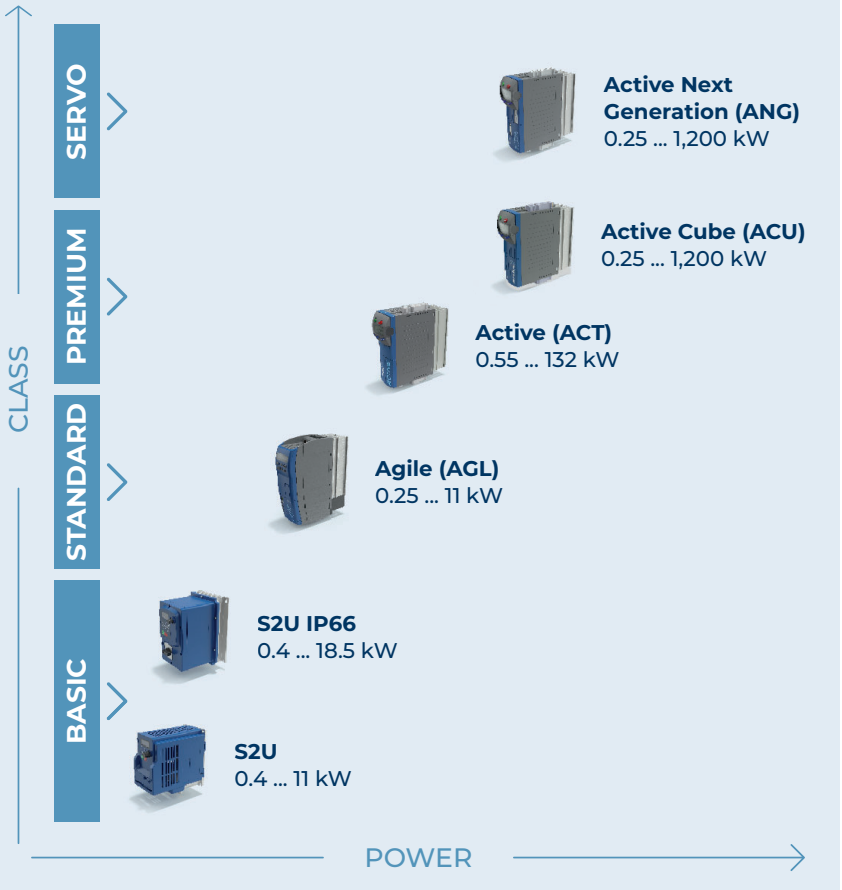
Our frequency inverters and servo drives portfolio fulfil the **highest IE2 efficiency class** in compliance with the **EN 61800-9-2 EcoDesign** regulation, for the reduction of energy consumption and the impact on the environment connected to industrial production.

Our drives give a major contribution to **energy consumption optimization and saving** to the entire plant. Several **incorporated functions** are available through parameter setup allowing to reduce the electrical energy needed to power motors, such as standby mode and automatic flux reduction.

Top level user experience

All our drives provide **intuitive engineering software** and **user-friendly programming interfaces** for parameter setting, diagnostic and supported commissioning.

Bonfiglioli frequency inverters and servo drives range



ACTIVE SERIES

Active (ACT) is the premium frequency inverter series offering a **modular set of features and options**, which make it suitable for a wide range of industrial applications.

With a **very wide power range** from 0.55 kW to 132 kW, several **optional modules for communication and expansion** for I/Os control and encoder evaluation, this series responds to the requirements of a variety of high performance applications, combining **broad connectivity** with **advanced control technology**.

The series include:

- 1 phase 230 V mains: 0.55 - 9.2 kW
- 3 phase 230 V mains: 0.55 - 9.2 kW
- 3 phase 400 V mains: 0.55 - 132 kW

APPLICATIONS

The high-performance, dynamic and versatile solutions for a wide spectrum of applications

Whether in material working, hoists and cranes, automated storages, packaging, textile or food and beverage the frequency inverters of the Active series are **optimized for numerous applications**.

Thanks to the **wide range of power sizes, mounting variants, optional communication** and **expansion modules,** the Active series offers a **flexible solution** for machine design, allowing great freedom in the selection of the most suitable features and options.

In addition, the Active series is characterized by **high compatibility with a wide range of motors types**: asynchronous, permanent magnet synchronous, ensuring very **high precision in speed, torque** and **position**, both in **open and closed loop** operation.

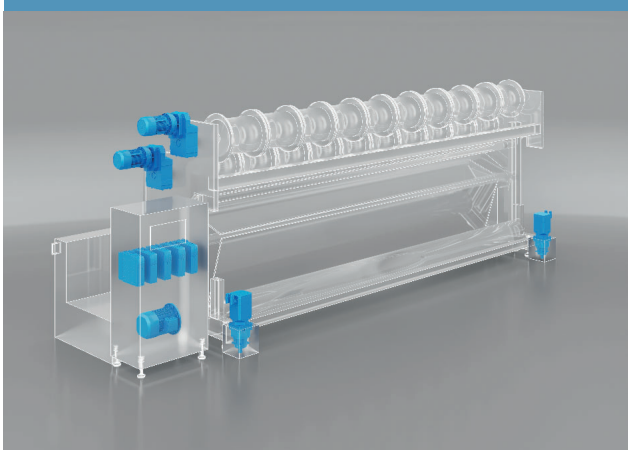
Our offer expands far beyond standard, providing the right solutions tailored to the most demanding customers' requirements.

RECYCLING

HOISTS AND CRANES

AUTOMATED STORAGE

TEXTILE

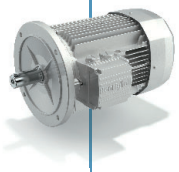


ACTIVE SYSTEM RANGE

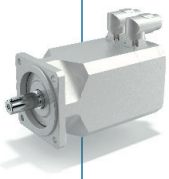
ACTIVE

Asynchronous

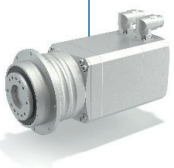
Synchronous



BXN, MXN, MNN, BN, BE, BX
Induction motors



BMD
Permanent Magnet motors

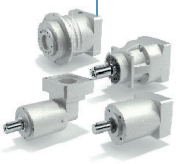


BMS
Precision Planetary Servo Gear motors

A

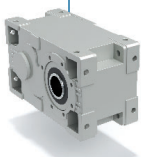
CP, C

VF/W



TQ/TQF, LCK, MPE, TR
Precision Planetary gearboxes

F



HDP/HDO

General purpose	High efficiency High Power density	High accuracy High dynamics

This catalogue concerns Active series and Active accessories.
For information about the other products showed in above overview, please refer to relevant catalogues.

ACTIVE KEY FEATURES AND BENEFITS

APPLICATIONS FLEXIBILITY

Thanks to its **flexibility**, the system can be adapted to meet many different applications requirements by selecting the most suitable **options and accessories**.
The ACT series is designed for several applications including **heavy duty** and other demanding applications. The high power range offers different mounting concepts for high **mechanical** flexibility.

ADVANCED CONTROL TECHNOLOGY

Active offers several **embedded functionalities for advanced control**, such as brake control and controlled ramping down during mains failures (mains power failure management) and many more.
Moreover, the single axis for the control of servo and asynchronous motors delivers **high dynamic response**, **high performance** and **application versatility**.
This series also offers support for commony used **feedback sensors**.

BROAD CONNECTIVITY

Smooth integration into automation networks thanks to the **compatibility with a wide range of fieldbus protocols** including CANopen, Profibus, Modbus and more.

WIDE POWER RANGE

The Active frequency inverter series offers power ranges **from 0.55 to 132 kW**.

USER FRIENDLY

The user-friendly **engineering software VPlus** provides an effective support for the **commissioning, tuning and monitoring** of the Active frequency inverters **from a PC**.
In addition, the optional **keypad** module is an **easy to use** tool to perform **setup and diagnosis** directly on the inverter.

MODULARITY

Several different communication and expansion modules allow the fitting approach for the interface to the machine. Additional accessories like brake resistors, main chokes and filters supplement the product series for the fitting operation.

THE DESIGNATION OF ACTX10 SERIES

ACT	410	–	07

Inverter series Active

Device

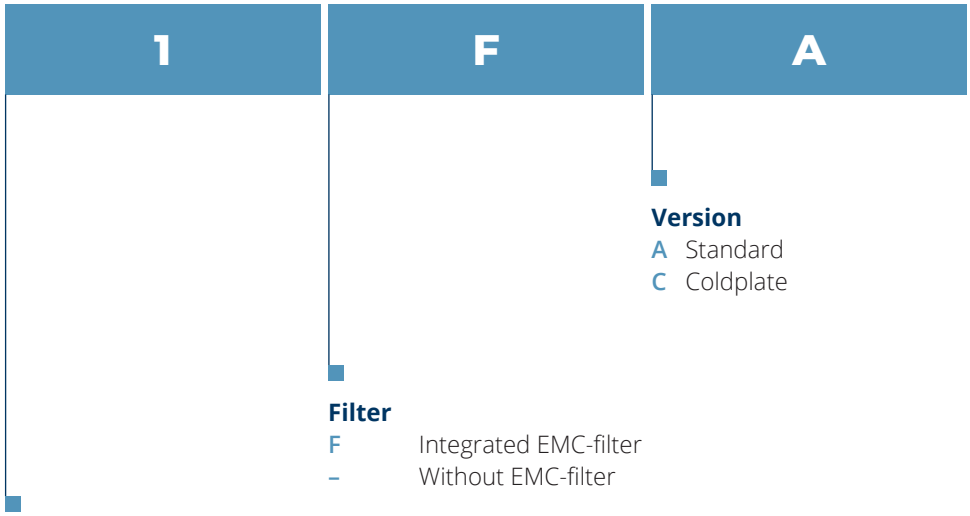
210 1/3 x 230 V_{AC}
410 3 x 400 V_{AC}

Drive Version

– Standard

Power

05 0.55 kW
07 0.75 kW
09 1.1 kW
11 1.5 kW
13 2.2 kW
15 3.0 kW
18 4.0 kW
19 5.5 kW
21 7.5 kW
22 9.2 kW
23 11 kW
25 15 kW
27 18.5 kW
29 22 kW
31 30 kW
33 37 kW
35 45 kW
37 55 kW
39 65 kW
43 75 kW
45 90 kW
47 110 kW
49 132 kW


1
F
A
Version
A Standard
C Coldplate
Filter
F Integrated EMC-filter
– Without EMC-filter
Mechanical Size
1 Frame Size 1
...
7 Frame Size 7

THE ORDER CODE OF ACTX10 SERIES

ACT	410	–	07	1	F	A	S	B

Inverter series Active

Device
210 1/3 x 230 V_{AC}
410 3 x 400 V_{AC}

Drive Version
– Standard

Power

05 0.55 kW	18 4.0 kW	27 18.5 kW	39 65 kW
07 0.75 kW	19 5.5 kW	29 22 kW	43 75 kW
09 1.1 kW	21 7.5 kW	31 30 kW	45 90 kW
11 1.5 kW	22 9.2 kW	33 37 kW	47 110 kW
13 2.2 kW	23 11 kW	35 45 kW	49 132 kW
15 3.0 kW	25 15 kW	37 55 kW	

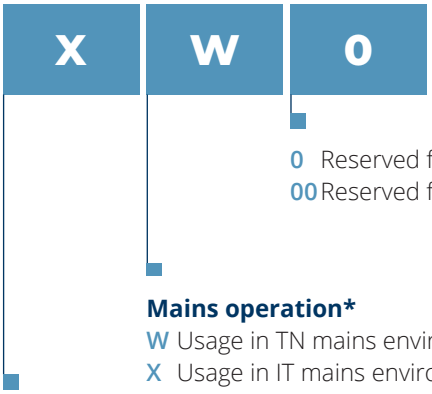
Mechanical Size
1 Frame Size 1
...
7 Frame Size 7

Filter
F Integrated EMC-filter
– Without EMC-filter

Version
A Standard
C Coldplate

Brake Chopper
X Without BC (size 6 and 7 only)
S BC included (standard)

Coating
X Without Coating



0 Reserved for future use (version with integrated EMC filter)
00 Reserved for future use (version without integrated EMC filter)

Mains operation*
W Usage in TN mains environments (Standard)
X Usage in IT mains environments or in combination with sinusoidal AEC mains units

Reserved
X Reserved for future use

Notes:
(*) In Sizes 1...4 the IT Bridge can be permanently removed by the user.
Sizes 5...7 have to be ordered according to the application requirements to receive the necessary modifications ex factory.

HARDWARE

Mounting and Cooling

- Standard Cabinet Mounting with Air Cooling (all mechanical sizes)
- ColdPlate Mounting (mechanical sizes 1...5)
- Liquid Cooling (mechanical sizes 5...7)
- DIN Rail mounting (mechanical sizes 1 & 2)
- Vibration resilient mounting kit for Air Cooling devices (mechanical sizes 1...6)

Automation

- Small dimensions and high power density in all sizes
- "Book shape" in smaller sizes for easy integration in automation cabinets
- Motor thermal evaluation
- Speed feedback input (encoder/resolver)
- Encoder support with Expansion modules: TTL, HTL, Resolver

Electrical

- Plug in control terminals for easy and fast connection
- Plug in power terminals up to 4 kW
- DC link bus for "energy sharing" in multidrive system architectures
- Integral EMC filters (EN 61800-3) up to 9.2 kW
- Integrated brake transistor on all sizes by default, sizes 6 & 7 available without brake transistor as option

Options and accessories

- Optional expansion modules to increase the I/Os and feedback acquisition of the inverter
- Optional communication modules to connect Active drives to control devices through Fieldbus connection
- Proprietary fieldbus (System bus) for fast communication among Bonfiglioli Active drives
- Multifunction keypad with monitoring and programming functions
- Drive-PC connection kit for advanced configuration with engineering software VPlus
- Compatible with Mains unit AEC allowing to feed back generatoric energy to the mains

Robustness

- Coated boards to enhance the device resilience [(1)]
- Vibration robustness according to DIN EN 60068-2-6: Test Fc and DIN EN 60068-2-27: Test Ea

SOFTWARE

Flexibility

- Control of asynchronous and synchronous motors (with or without encoder feedback)
- Preset values for Bonfiglioli motors to decrease commissioning times
- Full set of operation modes, freely selectable:
  - Servo synchronous control with Resolver encoder feedback (depending on option module)
  - Field oriented (vector) control with Incremental encoder
  - Sensorless field oriented (vector) and V/f control for all suppoprted motor types
- Flexible assignment of digital inputs and outputs to interface with software and hardware functions
- "Motor chopper" function to increase braking power without brake resistors
- 4 independent data sets
- Flying restart

Automation

- Easy and powerful engineering software for parameter setting, diagnostic and aided commissioning
- Integrated logic functions
- Speed and position synchronization between drives through System bus
- Electronic gear with optional Phasing
- PI control with advanced derivative control
- Intelligent current limits
- Motor potentiometer control via digital input, control unit and communication interface

Safety

- Mains voltage monitoring and buffering function to overcome short time power failures
- Adjustable motor protection functions
- Overload protection and automatic best switching frequency adjustment

Diagnosis

- Phase monitoring
- Mean and peak values storage
- Fault register (application and device)
- Optional Extension with Keypad and PC connection

Advanced application functions

- Power failure management to ramp down in a controlled way
- Spindle control with "tool change" positioning
- "Index" function for enhanced sensorless synchronization
- Advanced brake release control (lifting applications)
- Load detection function

Engineering software

- Extended Brake Control
- Easy programming interface
- Real time oscilloscope and variable values monitor for enhanced troubleshooting analysis
- A simple and guided procedure for set up with Bonfiglioli motors (asynchronous, synchronous)

GENERAL TECHNICAL DATA

Environment

Operating conditions
- 0°C - 40°C (40°C - 55°C with derating)
- Pollution Degree 2
- Overvoltage Category III for mains connection
- Overvoltage Category III for relay connector circuit up to 2000 m
- Overvoltage Category II for relay connector circuit above 2000 m

Environment class
- Climatic class during operation 3K22 (EN60721-3-3), formerly 3K3
- Relative humidity 15% ... 85%, no moisture condensation

Altitude of installation
- Up to 1000 m (up to 4000 m with derating)

Storage conditions
- According to EN61800-5-1

Protection degree (EN 60529)
- IP20 with correctly mounted covers and connection terminals

Environmental operation conditions according to DIN EN 60721-3-3:
- 3Z1 (negligible thermal radiation)
- 3B1 (no biological impact)
- 3C1 (chemically active substances, limits as per standard)
- 3S1 (mechanically active substances, no sand in air, limits as per standard)
- 3M4 (mechanical vibration and shocks, limits as per standard)

Electrical

Mains voltage operation
- ACT 210 in the range 184-0% ... 240 V+10%
- ACT 410 in the range 320-0% ... 480 V+10%

Rated mains frequency
- 45 ... 66 Hz

Overload current / Peak current
- 150 % Rated current for 60 s
- 200 % Rated Current for 1 s for most ratings

Electric protection
- Short circuit / Earth fault proof

Braking transistor
- Built-in by default, optionally available without in mechanical sizes 6 & 7

Standards

CE conformity:
- 2014/35/EU (Low voltage directive)
- 2014/30/EU (Electromagnetic Compatibility Directive)
- 2011/65/EU (RoHS Directive)
- EN61800-5-1:2007 (Adjustable speed electrical power drive systems - Safety requirements - Electrical, thermal and energy)
- EN61800-3:2004 + A1:2012 (Adjustable speed electrical power drive systems - EMC requirements and specific test methods)

Interference immunity

- According to EN 61800-3 for use in industrial environments

UL/CSA approval:
- UL/CSA approval, according to UL508c/CSA 22.2

ACT210 | Technical data (from 0.55 to 3.0 kW)

ACT210-			05	07	09	11	13	15
				Size 1			Size 2	
Filter Variant:				F			F	
Mechanical Variants:				A, C			A, C	
Output, motor side [1]								
Recommended rated motor power	P_n	kW	0.55	0.75	1.1	1.5	2.2	3.0
Rated motor current output	I_n	A	3.0	4.0	5.4	7.0	9.5	12.5 [1]
Rated motor voltage output	U_n	V	3 x (from 0 to mains voltage)					
Overload current (60 s)	I_{oc}	A	5.4	6.0	7.3	10.5	14.3	16.2
Peak current (1 s)	I_{pk}	A	6.0	8.0	8.0	14.0	19.0	19.0
Switching frequency	f_c	kHz	From 2 to 16 kHz (Default: 4 kHz)					
Output frequency	f_n	Hz	0 ... 599 Hz [2]					
Input, mains side								
Rated mains voltage	U	V	230					
Rated current 3 ph	I	A	3.0	4.0	5.5 [4]	7.0	9.5	10.5 [4]
Recommended Mains fuses 3ph	I	A	6	6	10	10	16	16
Rated current 1 ph/N; 2 ph	I	A	5.4	7.2	9.5 [4]	13.2	16.5 [4]	16.5 [4]
Recommended Mains fuses 1 ph/N; 2ph	I	A	10	10	16	16	20	20
General								
Connection Signal terminals [1]	A	mm^2	0.2 ... 1.5 (detachable terminals)					
Connection Power terminals [1]	A	mm^2	0.2 ... 1.5 (detachable terminals)					
Short circuit / ground fault protection	-	-	Yes					
Mounting position	-	-	Vertical					
Dimensions Standard Device	HxWxD	mm	190 x 60 x 175			250 x 60 x 175		
Dimensions ColdPlate Device	HxWxD	mm	190 x 82 x 140			250 x 85 x 140		
Weight (approx.)	m	kg	1.2			1.6		
Brake chopper	-	-	Internal brake chopper					
UL/CSA approval	-	-	ul508c/CSA 22.2-No.14					
Environment								
Cooling temperature	T_n	°C	From 0 to 40					
Relative air humidity	-	%	From 15 to 85, non-condensing					
Options & accessories								
Screen sheet for cable screens	-	-	SCR1-2					
Pass through mounting kit	-	-	MPVS1			MPVS2		
Increased Vibration mounting kit	-	-	MNVIB1			MNVIB2		
DIN rail mounting kit	-	-	MDIN1			MDIN2		
Input line choke	-	-	External (depending on mains supply)					
EMC filter	-	-	Internal Filter: Category C3 / External Filter or external choke: Category C2 / C1 [3]					

Notes:
(1) Please check the Operating Instructions for additional data
(2) Higher frequencies available on request
(3) For more details, please check the Input filter table in this catalogue
(4) Continous operation with rated current requires a line choke

ACT210 | Technical data (from 4.0 to 9.2 kW)

ACT210-			18	19	21	22
			Size 3		Size 4	
	Filter Variant:		F		-	
	Mechanical Variants:		A, C		A, C	
Output, motor side [1]						
Recommended rated motor power	P_n	kW	4.0	5.5	7.5	9.2
Rated motor current output	I_n	A	18.0	22.0	32.0	35.0
Rated motor voltage output	U_n	V	3 x (from 0 to mains voltage)			
Overload current (60 s)	I_{oc}	A	26.3	30.3	44.5	51.5
Peak current (1 s)	I_{pk}	A	33.0	33.0	64.0	64.0
Switching frequency	f_c	kHz	From 2 to 16 kHz (Default: 4 kHz)			
Output frequency	f_n	Hz	0 ... 599 Hz [2]			
Input, mains side						
Rated mains voltage	U	V	230			
Rated current 3 ph	I	A	18	20 [3]	28.2 [3]	35.6 [3]
Recommended Mains fuses	I	A	25		35	50
General						
Connection Signal terminals [1]	A	mm^2	0.2 ... 1.5 (detachable terminals)			
Connection Power terminals [1]	A	mm^2	0.2 ... 6		0.2 ... 16	
Short circuit / ground fault protection	-	-	Yes			
Mounting position	-	-	Vertical			
Dimensions Standard Device	HxWxD	mm	250 x 100 x 200		250 x 125 x 200	
Dimensions ColdPlate Device	HxWxD	mm	250 x 125 x 144		250 x 150 x 144	
Weight (approx.)	m	kg	3.0		3.7	
Brake chopper	-	-	Internal brake chopper			
UL/CSA approval	-	-	-		UL508c/CSA 22.2-No.14	
Environment						
Cooling temperature	T_n	°C	From 0 to 40			
Relative air humidity	-	%	From 15 to 85, non-condensing			
Options & accessories						
Screen sheet for cable screens	-	-	SCR3		SCR4	
Pass through mounting kit	-	-	MPVS3		MPVS4	
Increased Vibration mounting kit	-	-	MNVIB3		MNVIB4	
Input line choke	-	-	External (depending on mains supply)			
EMC filter	-	-	For selection of EMC related components, please check the Input filter table in this catalogue			

Notes:
(1) Please check the Operating Instructions for additional data
(2) Higher frequencies available on request
(3) Continous operation with rated current requires a line choke

ACT410 | Technical data (from 0.55 to 3.0 kW)

ACT410-			05	07	09	11	12	13	15
				Size 1				Size 2	
Filter Variant:				F				F	
Mechanical Variants:				A, C				A, C	
Output, motor side [1]									
Recommended rated motor power	P_n	kW	0.55	0.75	1.1	1.5	1.85	2.2	3.0
Rated motor current output	I_n	A	1.8	2.4	3.2	3.8	4.2	5.8	7.8
Rated motor voltage output	U_n	V	3 x (from 0 to mains voltage)						
Overload current (60 s)	I_{oc}	A	2.7	3.6	4.8	5.7	6.3	8.7	11.7
Peak current (1 s)	I_{pk}	A	3.6	4.8	6.4	7.6	8.4	11.6	15.6
Switching frequency	f_c	kHz	From 2 to 16 kHz (Default: 4 kHz)						
Output frequency	f_n	Hz	0 ... 599 Hz [1]						
Input, mains side									
Rated mains voltage	U	V	400						
Rated current 3 ph	I	A	1.8	2.4	2.8 [3]	3.3 [3]	4.2	5.8	6.8 [3]
Recommended Mains fuses	I	A	6				6	10	
General									
Connection Signal terminals [1]	A	mm^2	0.2 ... 1.5 (detachable terminals)						
Connection Power terminals [1]	A	mm^2	0.2 ... 1.5 (detachable terminals)						
Short circuit / ground fault protection	-	-	Yes						
Mounting position	-	-	Vertical						
Dimensions Standard Device	HxWxD	mm	190 x 60 x 175				250 x 60 x 175		
Dimensions ColdPlate Device	HxWxD	mm	190 x 82 x 140				250 x 85 x 140		
Weight (approx.)	m	kg	1.2				1.6		
Brake chopper	-	-	Internal brake chopper						
UL/CSA approval	-	-	ul508c/CSA 22.2-No.14						
Environment									
Cooling temperature	T_n	°C	From 0 to 40						
Relative air humidity	-	%	From 15 to 85, non-condensing						
Options & accessories									
Screen sheet for cable screens	-	-	SCR1-2						
Pass through mounting kit	-	-	MPVS1				MPVS2		
Increased Vibration mounting kit	-	-	MNVIB1				MNVIB2		
DIN rail mounting kit	-	-	MDIN1				MDIN2		
Input line choke	-	-	External (depending on mains supply)						
EMC filter	-	-	Internal Filter: Category C3 / External Filter or external choke: Category C2 / C1 [4]						

Notes:
(1) Please check the Operating Instructions for additional data
(2) Higher frequencies available on request
(3) Continous operation with rated current requires a line choke
(4) For more details, please check the Input filter table in this catalogue

ACT410 | Technical data (from 4.0 to 15 kW)

ACT410-			18	19	21	22	23	25
			Size 2		Size 3		Size 4	
	Filter Variant:		F		- or F		-	
	Mechanical Variants:		A, C		A, C		A, C	
Output, motor side [1]								
Recommended rated motor power	P_n	kW	4.0	5.5	7.5	9.2	11.0	15.0
Rated motor current output	I_n	A	9.0	14.0	18.0	22.0	25.0	32.0
Rated motor voltage output	U_n	V	3 x (from 0 to mains voltage)					
Overload current (60 s)	I_{oc}	A	13.5	21.0	26.3	30.3	37.5	44.5
Peak current (1 s)	I_{pk}	A	18.0	28.0	33.0	33.0	50.0	64.0
Switching frequency	f_c	kHz	From 2 to 16 kHz (Default: 4 kHz)					
Output frequency	f_n	Hz	0 ... 599 Hz [2]					
Input, mains side								
Rated mains voltage	U	V	400					
Rated current 3 ph	I	A	7.8 [3]	14.2	15.8 [3]	20.0 [3]	26.0	28.2 [3]
Recommended Mains fuses	I	A	10.0	16.0	25.0		35.0	
General								
Connection Signal terminals [1]	A	mm^2	0. 2... 1.5 (detachable terminals)					
Connection Power terminals [1]	A	mm^2	0.2 ... 1.5 (detachable terminals)	0.2 ... 6			0.2 ... 16	
Short circuit / ground fault protection	-	-	Yes					
Mounting position	-	-	Vertical					
Dimensions Standard Device	HxWxD	mm	250 x 60 x 175	250 x 100 x 200			250 x 125 x 200	
Dimensions ColdPlate Device	HxWxD	mm	250 x 85 x 144	250 x 125 x 144			250 x 150 x 144	
Weight (approx.)	m	kg	1.6	3.0			3.7	
Brake chopper	-	-	Internal brake chopper					
UL/CSA approval	-	-	ul508c/CSA 22.2-No.14					
Environment								
Cooling temperature	T_n	°C	From 0 to 40					
Relative air humidity	-	%	From 15 to 85, non-condensing					
Options & accessories								
Screen sheet for cable screens	-	-	SCR1-2	SCR3			SCR4	
Pass through mounting kit	-	-	MPVS2	MPVS3			MPVS4	
Increased Vibration mounting kit	-	-	MNVIB2	MNVIB3			MNVIB4	
DIN rail mounting kit	-	-	MDIN2	-			-	
Input line choke	-	-	External (depending on mains supply)					
EMC filter	-	-	For selection of EMC related components, please check the Input filter table in this catalogue					

Notes:
(1) Please check the Operating Instructions for additional data
(2) Higher frequencies available on request
(3) Continous operation with rated current requires a line choke

ACT410 | Technical data (from 18.5 to 65 kW)

ACT410-			27	29	31	33	35	37	39
				Size 5				Size 6	
Mechanical Variants:				A, C, L				A, L	
Brake Chopper Variant:				S				S, X	
Output, motor side [1]									
Recommended rated motor power	P_n	kW	18.5	22.0	30.0	37.0	45.0	55.0	65.0
Rated motor current output	I_n	A	40.0	45.0	60.0	75.0	90.0	110.0	125.0
Rated motor voltage output	U_n	V	3 x (from 0 to mains voltage)						
Overload current (60 s)	I_{oc}	A	60.0	67.5	90.0	112.5	135.0	165.0	187.5
Peak current (1 s)	I_{pk}	A	80.0	90.0	120.0	150.0	180.0	220.0	250.0
Switching frequency	f_c	kHz	From 2 to 8 kHz (Default: 4 kHz) [5]						
Output frequency	f_n	Hz	0 ... 599 Hz [2]						
Input, mains side									
Rated mains voltage	U	V	400						
Rated current 3 ph	I	A	42.0	50.0	58.0 [3]	87.0	104.0	105.0 [3]	120.0 [3]
Recommended Mains fuses	I	A	50.0		63.0	100.0	125.0	125.0	
General									
Connection Signal terminals [1]	A	mm^2	0.2 ... 1.5 (detachable terminals)						
Connection Power terminals [1]	A	mm^2	... 25			... 70			
Short circuit / ground fault protection	-	-	Yes						
Mounting position	-	-	Vertical						
Dimensions Standard Device	HxWxD	mm	250 x 200 x 260			400 x 275 x 260			
Dimensions ColdPlate Device	HxWxD	mm	250 x 225 x 171			-			
Dimensions Liquid Cooling Device	HxWxD	mm	480 x 300 x 220			480 x 300 x 208			
Weight Standard Device (approx.)	m	kg	8.0			20.0			
Weight ColdPlate Device (approx.)	m	kg	6.0			-			
Weight Liquid Cooling Device (approx.)	m	kg	22.0			25.0			
Brake chopper	-	-	Internal brake chopper			Internal brake chopper, optionally available without			
UL/CSA approval: Device series "A" & "C"	-	-	ul508c/CSA 22.2-No.14						
UL/CSA approval: Device series "L"	-	-	-						
Environment									
Cooling temperature [4]	T_n	°C	From 0 to 40						
Relative air humidity	-	%	From 15 to 85, non-condensing						
Options & accessories									
Screen sheet for cable screens	-	-	SCR5			-			
Pass through mounting kit	-	-	MPVS5			MPVS6			
Increased Vibration mounting kit	-	-	MNVIB5			MNVIB6			
Input line choke	-	-	External (depending on mains supply)						
EMC filter	-	-	For selection of EMC related components, please check the Input filter table in this catalogue						

Notes:
(1) Please check the Operating Instructions for additional data
(2) Higher frequencies available on request
(3) Continous operation with rated current requires a line choke
(4) When using Liquid Cooling devices, please check the Additional Operating Instructions for Liquid Cooling
(5) Higher Switching frequencies available on request

ACT410 | Technical data (from 75 to 132 kW)

ACT410-			43	45	47	49
				Size 7		
Mechanical Variants:				A, L		
Brake Chopper Variant:				S, X		
Output, motor side [1]						
Recommended rated motor power	P_n	kW	75	90	110	132
Rated motor current output	I_n	A	150	180	210	250
Rated motor voltage output	U_n	V	3 x (from 0 to mains voltage)			
Overload current (60 s)	I_{oc}	A	225	270	315	332
Peak current (1 s)	I_{pk}	A	270	325	375	375
Switching frequency	f_c	kHz	From 2 to 8 kHz (Default: 4 kHz) [7]			
Output frequency	f_n	Hz	0 ... 599 Hz [2]			
Input, mains side						
Rated mains voltage	U	V	400			
Rated current 3 ph	I	A	143 [5]	172 [5]	208 [5]	249 [5]
Recommended Mains fuses	I	A	160	200	250	315
General						
Connection Signal terminals [1]	A	mm^2	0.2 ... 1.5 (detachable terminals)			
Connection Power terminals [1]	A	mm^2	... 2x95			
Short circuit / ground fault protection	-	-	Yes			
Mounting position	-	-	Vertical			
Dimensions [3]	HxWxD	mm	510 x 412 x 351			
Weight (approx.)	m	kg	48		48	
Brake chopper	-	-	Internal brake chopper, optionally available without			
UL/CSA approval: Device series "A"	-	-	ul508c/CSA 22.2-No.14			
UL/CSA approval: Device series "L"	-	-	-			
Environment						
Cooling temperature [6]	T_n	°C	From 0 to 40			
Relative air humidity	-	%	From 15 to 85, non-condensing			
Options & accessories						
Pass through mounting kit			MPVS7			
Input line choke	-	-	External (depending on mains supply)			
EMC filter	-	-	For selection of EMC related components, please check the Input filter table in this catalogue			

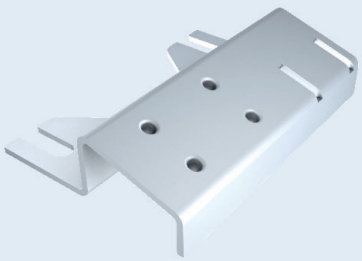
Notes:
(1) Please check the Operating Instructions for additional data
(2) Higher frequencies available on request
(3) Dimensions are the same for Standard and Liquid
(4) -53 is available as Liquid Cooling device
(5) Operation requires a line choke
(6) When using Liquid Cooling devices, please check the Additional Operating Instructions for Liquid Cooling
(7) Higher Switching frequencies available on request

SCREEN PLATES

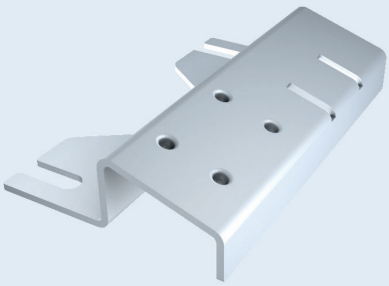
SCR1-2, SCR3, SCR4, SCR5

For the mechanical sizes 1 to 5 screen plates are available for the mounting of electrical cable screens.

SCR1-2

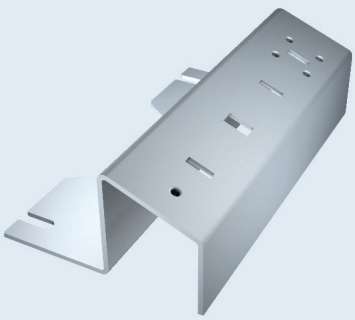


SCR3

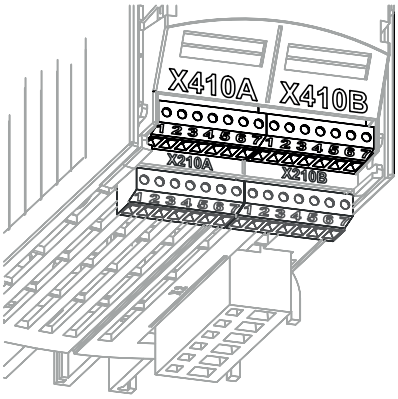


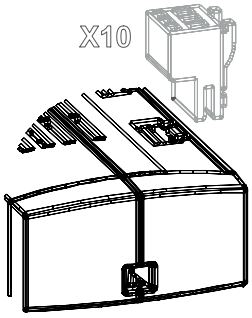
SCR4

SCR5



CONTROL TERMINALS





Control terminal X210A	
X210A.1	Voltage output DC +20 V
X210A.2	Ground / GND 20 V
X210A.3	Digital Input (1) S1IND
X210A.4	Digital input (1) EM-S2IND
X210A.5	Digital input (1) EM-S3IND
X210A.6	Digital input (1) S4IND
X210A.7	Digital input (1) S5IND

Control terminal X210B	
X210B.1	Digital input (1) S6IND
X210B.2	Ground / GND 20 V
X210B.3	Digital Output (1) S1OUT
X210B.4	Multifunction output (1) MFO1
X210B.5	Reference output DC +10 V (I_{max}=4 mA)
X210B.6	Multifunction input (1) MFI1 0 V ... +10 V
X210B.7	Ground / GND 10 V

Relay output X10	
S3OUT	Relay output (1) Make Contact: AC 5 A / 240 V, DC 5 A (ohmic) / 24 V Break Contact: AC 3 A / 240 V, DC 1 A (ohmic) / 24 V

(1) Control terminals are freely configurable.

Control terminal X410A	
X410A.1	Depends on selected Expansion module
X410A.2	Depends on selected Expansion module
X410A.3	Depends on selected Expansion module
X410A.4	Depends on selected Expansion module
X410A.5	Depends on selected Expansion module
X410A.6	Depends on selected Expansion module
X410A.7	Depends on selected Expansion module

Control terminal X410B	
X410B.1	Depends on selected Expansion module
X410B.2	Depends on selected Expansion module
X410B.3	Depends on selected Expansion module
X410B.4	Depends on selected Expansion module
X410B.5	Depends on selected Expansion module
X410B.6	Depends on selected Expansion module
X410B.7	Depends on selected Expansion module

OPTION MODULES

The Active driver is designed to give the highest flexibility in drive hardware to suit every control requirement. Machine designers can select from an extensive range of possible expansion hardware modules that can be fitted directly into the 3 available slots on the standard Active unit. Mounting and connection is fast and easy thanks to onboard fastening devices.

Using option modules, the Active series features and integration ability can be greatly expanded: the number of possible hardware configurations offers solutions for a wide variety of requirements and applications.

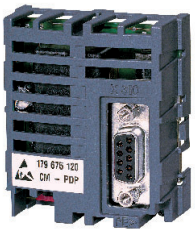
Build the best hardware configuration of Active for your machine!

Hardware modularity

Interface module

Connection of optional control unit KP500, PC interface adapter KP-USB, or the control unit remote cable for accessory KPCMK.

Hardware modularity



CM communication module

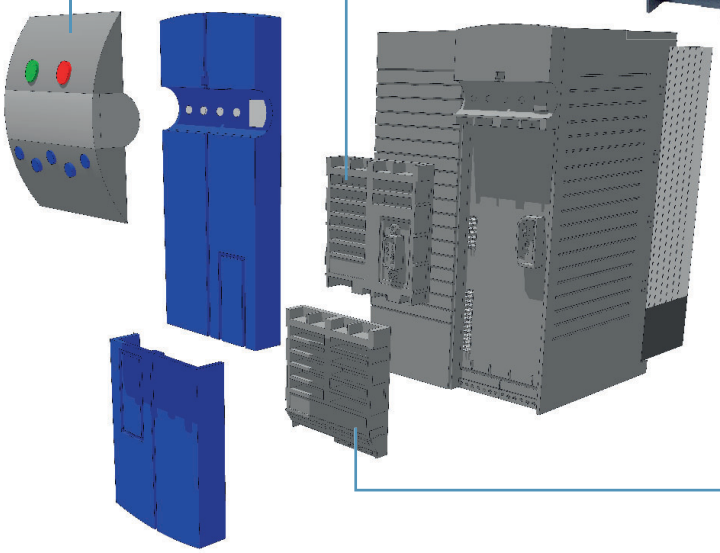
Connection panel for various communication protocols:

- CM-232, RS232 interface
- CM-485, RS485 interface
- CM-PDP, Profibus interface
- CM-CAN, CANopen interface

EM expansion module

Connection panel for adaptation of control inputs and outputs to the various applications on the basis of specific machine requirements:

- EM-IO, analog and digital inputs and outputs, available in 4 variants
- EM-ENC, encoder interface, frequency output and system bus, available in 5 variants
- EM-RES, resolver interface, frequency output and system bus, available in 2 variants
- EM-SYS, system bus communication
- Other customised modules available on request



Option modules can be ordered either separately or together with ACT base unit, as an “extended” power package. The majority of Active option modules can also be used in the Active series, thus allowing drives from both series to be easily used in the same automation system.
Select from below the hardware module to customize Active and build a unique drive which best fits to the needs of your application.

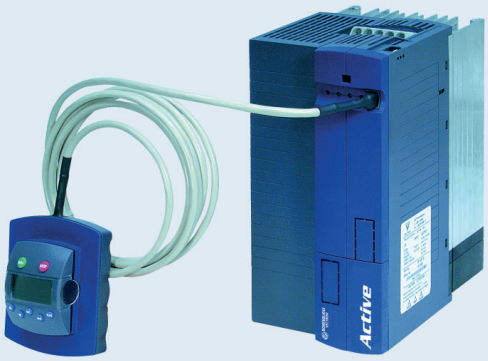
								Speed encoder		System Bus
		AI	AO	DI	DO	RELAY	RF	Type (s)	Zero pulse	
Basic equipment of Active		1 (2)	-	6 (3)	1	1	-	HTL	yes	-
	EM-IO-01	1	1	3	-	2	-	HTL	yes	yes
	EM-IO-02	1	1	3	-	1	-	HTL	yes	yes
	EM-IO-03	1	2	2	-	1	-	HTL	no	yes
	EM-IO-04	-	-	2	1 1)	-	-	-	-	yes
	EM-ENC-01	1	-	-	-	-	yes 4)	TTL & HTL	no	yes
	EM-ENC-02	1	1	-	1 1)	-	-	TTL & HTL	no	yes
	EM-ENC-03	-	-	-	-	-	-	TTL & HTL	no	yes
	EM-ENC-04	1	1	-	-	1	-	TTL & HTL	yes	no
	EM-ENC-05	1	1	-	-	-	-	TTL & HTL	yes	yes
	EM-RES-01	1	-	-	-	-	yes 4)	Resolver		yes
	EM-RES-02	1	-	-	-	-	yes 5)	Resolver		no
	EM-SYS	-	-	-	-	-	-	-	-	yes

1) Can be used as digital input alternatively
2) MFI1 can be used as digital input alternatively
3) One DI is used for control enable. HTL encoder evaluation possible.
4) Repetition frequency without Zero Pulse
5) Repetition frequency with Zero Pulse
RF: Repetition frequency, speed sensor simulation.
All inputs/outputs are realized with disconnectable terminals

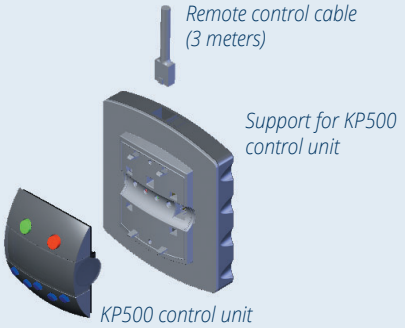
Communication		
	CM-CAN	Connectors realized with DSUB-9 connector
	CM-PDP	
	CM-485	
	CM-232	

CONTROL UNIT | KP500

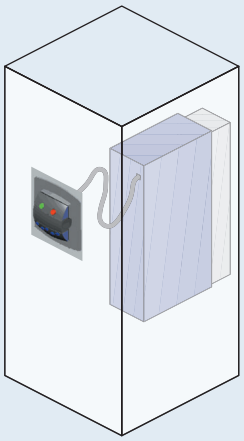
The Active series is designed to give the highest flexibility in drive hardware to suit every control requirement. Machine designers can select an optional Keypad for diagnosis or parameterization independent from a Personal Computer. An optional remote unit gives the possibility to mount the keypad on a cabinet door or convert a keypad into a handheld.



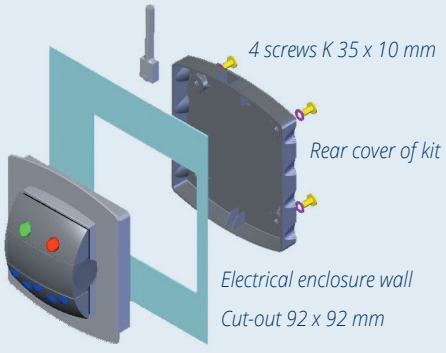
Control unit remote installation kit / KPCMK
The KPCMK kit is used to remotely control the inverter from the KP500 unit.



Handheld remote control unit

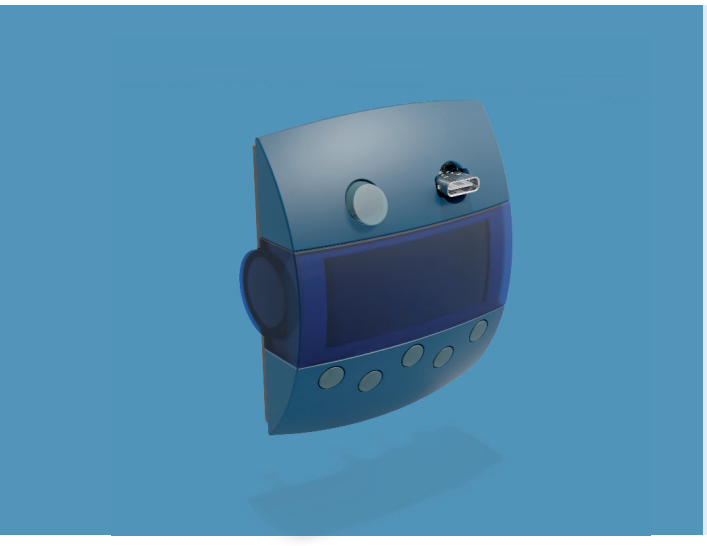


Remote installation on exterior of enclosure

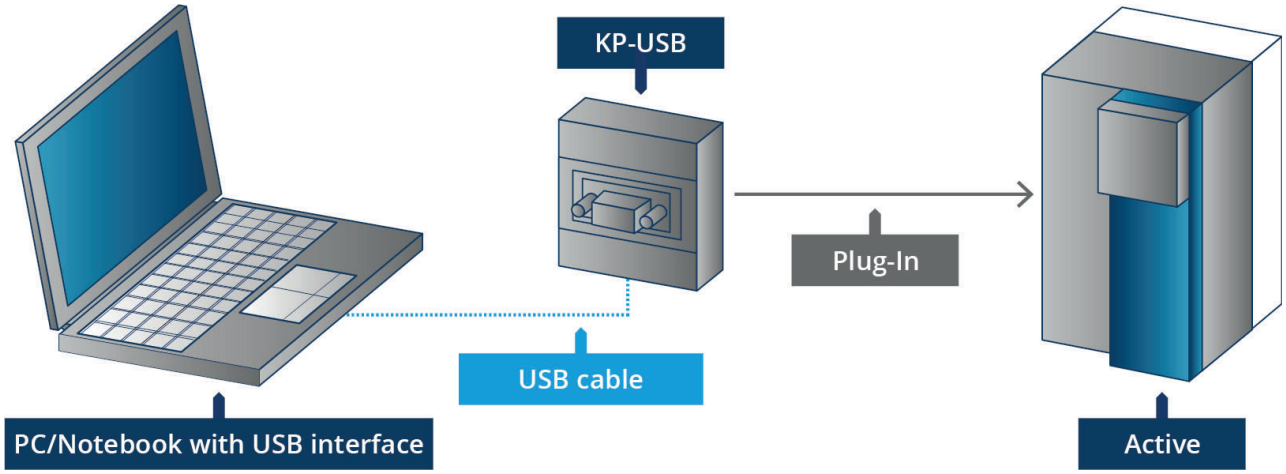


Fixing to enclosure

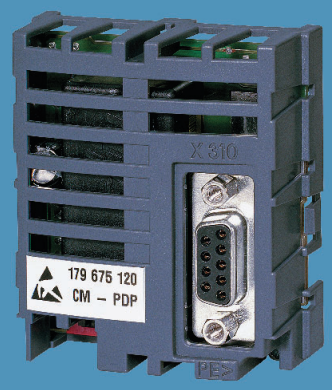
INTERFACE | KP-USB



The KP-USB adapter can be used as an alternative to control unit KP500. This connection enables parameterisation, monitoring, setting management, inverter control and even commissioning from a PC or laptop computer. The USB point-to-point connection allows in an easy way the connection between inverter series ACTx10/ACUx10/ANGx10 and PC.



COMMUNICATION MODULES



For integration into fieldbus networks you can install an optional module with an additional network interface.
Active inverters can therefore be integrated into existing fieldbus networks simply by adapting inverter communications to the hardware and software of the existing communications standard.
Active inverters share the same communication module platform with other Bonfiglioli inverter series like Agile reducing stock costs when using different Bonfiglioli inverter series. They also profit from the same plug & play functionality, so that the inverter recognises and enables the new module automatically as soon as it is powered on.

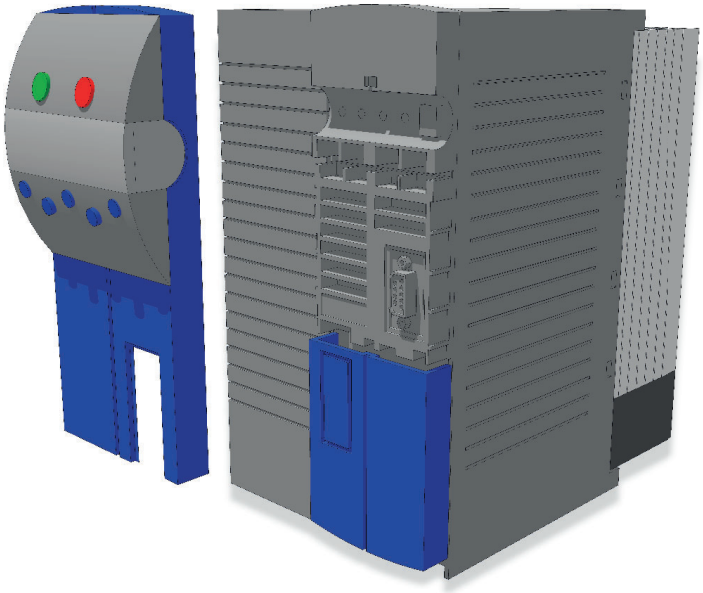
Active inverters support various communication standards with option modules. See the table alongside.

All optional modules are identical in shape and size, but differ in electronic functioning according to the standards of the type of field bus they communicate with.

Communication modules are installed in slots in the front of the inverter. Simply remove the protective cover to access the slots. A secure push-fit ensures an efficient electrical connection.

With the front panel removed, the connector (typically DSUB-9) for the communication module is also accessible.

Field bus	Optional module
CANopen	CM-CAN
Profibus DP	CM-PDP
RS232	CM-232
RS485 Modbus	CM-485

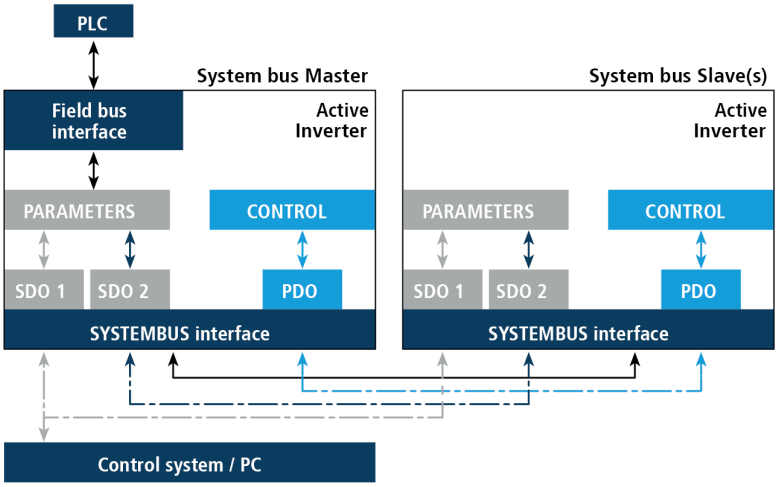


SYSTEM BUS | EM-SYS MODULE

The System bus of Active inverters is a proprietary communication bus, based on CANopen protocol that allows fast exchange of data between the inverters and access, by a system bus master, to the parameters of all devices connected on the network.
The system bus nodes (max. 64) are connected by a three-wire line.

The bus termination (at either first or last node) can be activated via DIP switches of the EM-SYS module.
The system bus is equipped with three PDO (Process Data Object) channels that allow rapid exchanges of process data for each inverter. There are also two SDO (Service Data Object) channels for parameterisation purposes.
Thanks to the three PDO channels, with one transmission and one reception channel, all inverter data can be transmitted. Among other advantages, this makes it possible to create master/slave and daisy chain configurations easily, while ensuring very high precision and speed.

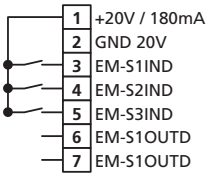
Each transmission and reception channel includes 8 bytes that can be freely occupied by objects, thereby offering the maximum flexibility for a very broad range of applications. The selection of transmission objects and reception objects is made easy by the VPlus program, and no additional configuration tools are needed.

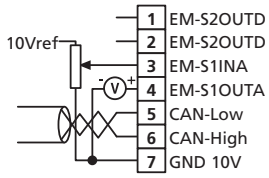


EXPANSION MODULE EM-IO-XX

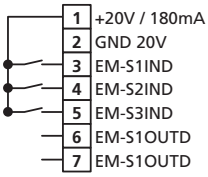
The EM-IO-xx expansion module extends the number of the standard inputs and outputs provided on the Active inverter for connection of various applications.
Analog inputs and outputs can be available also with bipolar signals and must therefore be configured with inverter parameters.
The supplementary digital inputs provided on the expansion module are electrically equivalent to the standard inputs.
The relay changer contact represents an alternative for the activation of high power to the relay output available as a standard feature.
System bus is available on three control terminals and supports easy control of decentralised drive systems.

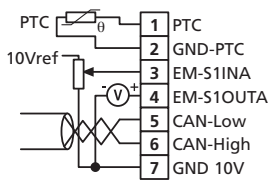
EM-IO-01

Terminal board X410A	Terminal	Function
	X410A.1	20 V power supply output (180 mA)
	X410A.2	GND 20 V
	X410A.3	EM-S1IND multifunction digital input U_{max} = 30 V (24 V/10 mA), PLC compatible
	X410A.4	EM-S2IND multifunction digital input U_{ax} = 30 V (24 V/10 mA), PLC compatible
	X410A.5	EM-S3IND multifunction digital input U_{max} = 30 V (24 V/10 mA), PLC compatible
	X410A.6	EM-S1OUTD multifunction relay output, U_{max} = 24 V AC, 1 A (ohmic)
	X410A.7	

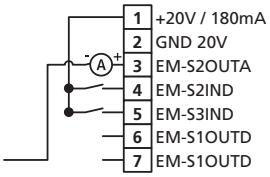
Terminal board X410B	Terminal	Function
	X410B.1	EM-S2OUTD multifunction relay output, U_{max} = 24 V AC, 1 A (ohmic)
	X410B.2	
	X410B.3	EM-S1INA +/- 10 V or +/- 20 mA analog input
	X410B.4	EM-S1OUTA +/- 10 V multifunction analog output
	X410B.5	CAN-Low System bus
	X410B.6	CAN-High System bus
	X410B.7	GND

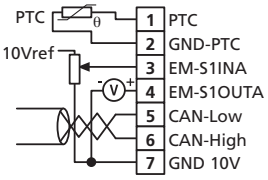
EM-IO-02

Terminal board X410A	Terminal	Function
	X410A.1	20 V power supply output (180 mA)
	X410A.2	GND 20 V
	X410A.3	EM-S1IND multifunction digital input U_{max} = 30 V (24 V/10 mA), PLC compatible
	X410A.4	EM-S2IND multifunction digital input U_{max} = 30 V (24 V/10 mA), PLC compatible
	X410A.5	EM-S3IND multifunction digital input U_{max} = 30 V (24 V/10 mA), PLC compatible
	X410A.6	EM-S1OUTD multifunction relay output, U_{max} = 24 V, 1 A (ohmic)
	X410A.7	

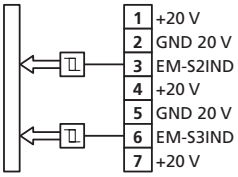
Terminal board X410B	Terminal	Function
	X410B.1	EM-S2OUTD multifunction relay output, U_{max} = 24 V, 1 A (ohmic)
	X410B.2	
	X410B.3	EM-S1INA +/- 10 V or +/- 20 mA analog input
	X410B.4	EM-S1OUTA +/- 10 V multifunction analog output
	X410B.5	CAN-Low System bus
	X410B.6	CAN-High System bus
	X410B.7	GND

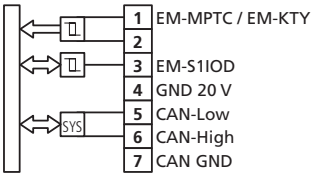
EM-IO-03

Terminal board X410A	Terminal	Function
	X410A.1	20 V power supply output (180 mA)
	X410A.2	GND 20 V
	X410A.3	EM-S1IND multifunction digital input U_{max} = 30 V (24 V/10 mA), PLC compatible
	X410A.4	EM-S2IND multifunction digital input U_{max} = 30 V (24 V/10 mA), PLC compatible
	X410A.5	EM-S3IND multifunction digital input U_{max} = 30 V (24 V/10mA), PLC compatible
	X410A.6	EM-S1OUTD multifunction relay output, U_{max} = 24 V, 1 A (ohmic)
	X410A.7	

Terminal board X410B	Terminal	Function
	X410B.1	EM-S2OUTD multifunction relay output, U_{max} = 24 V AC, 1 A (ohmic)
	X410B.2	
	X410B.3	EM-S1INA +/- 10 V or +/- 20 mA analog input
	X410B.4	EM-S1OUTA +/- 10 V analog output
	X410B.5	CAN-Low System bus
	X410B.6	CAN-High System bus
	X410B.7	GND

EM-IO-04

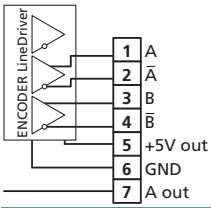
Terminal board X410A	Terminal	Function
	X410A.1	Voltage output 20 V
	X410A.2	GND 20 V
	X410A.3	EM-S1IND multifunction digital input U_{max} = 30 V (24 V/10 mA), PLC compatible
	X410A.4	EM-S2IND multifunction digital input U_{max} = 30 V (24 V/10 mA), PLC compatible
	X410A.5	EM-S3IND multifunction digital input U_{max} = 30 V (24 V/10mA), PLC compatible
	X410A.6	EM-S1OUTD multifunction relay output, U_{max} = 24 V, 1 A (ohmic)
	X410A.7	

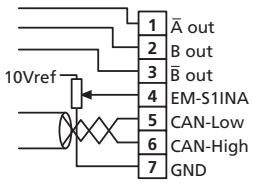
Terminal board X410B	Terminal	Function
	X410B.1	Motor PTC thermistor connection EM-MPTC or connection motor temperature sensor EM-KTY
	X410B.2	
	X410B.3	EM-S1INA +/- 10 V or +/- 20 mA analog input
	X410B.4	EM-S1OUTA +/- 10 V analog output
	X410B.5	CAN-Low System bus
	X410B.6	CAN-High System bus
	X410B.7	GND

SPEED SENSOR MODULES EM-ENC-XX

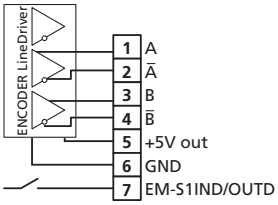
The EM-ENC-xx expansion module extends the number of speed sensor inputs of terminal board of the frequency inverter, and also increases the number of configurable pulse outputs with encoder repetition output.
EM-ENC-xx is able to acquire both TTL and HTL incremental speed sensors according to standard EIA RS422 (line driver) with 5-volt logic. The EM-ENC-xx speed sensor module is equipped with connection terminals for signals A, $\overline{A}$, B and $\overline{B}$ of the line driver speed sensor and terminals for repetition output of the same signals (speed sensor emulation). This makes it possible to create master-slave configurations between several separate units using output signals of one unit as input signals of the next.

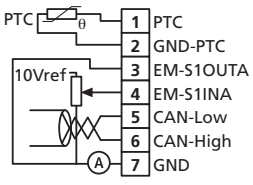
EM-ENC-01

Terminal board X410A	Terminal	Function
	X410A.1	Channel A+ speed sensor input
	X410A.2	Channel A– speed sensor input
	X410A.3	Channel B+ speed sensor input
	X410A.4	Channel B– speed sensor input
	X410A.5	+5 V (200 mA) power supply output
	X410A.6	GND 5 V
	X410A.7	Channel A+ repetition frequency output

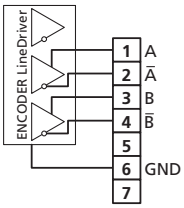
Terminal board X410B	Terminal	Function
	X410B.1	Channel A– repetition frequency output
	X410B.2	Channel B+ repetition frequency output
	X410B.3	Channel B– repetition frequency output
	X410B.4	EM-S1INA +/- 10 V or +/- 20 mA analog input
	X410B.5	CAN-Low System bus
	X410B.6	CAN-High System bus
	X410B.7	GND

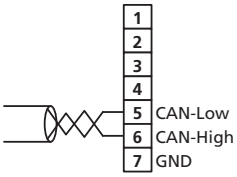
EM-ENC-02

Terminal board X410A	Terminal	Function
	X410A.1	Channel A+ speed sensor input
	X410A.2	Channel A– speed sensor input
	X410A.3	Channel B+ speed sensor input
	X410A.4	Channel B– speed sensor input
	X410A.5	+5 V (200 mA) power supply output
	X410A.6	GND 5V
	X410A.7	Channel A+ repetition frequency output

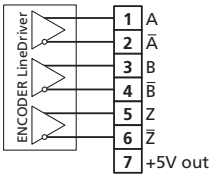
Terminal board X410B	Terminal	Function
	X410B.1	Channel A– repetition frequency output
	X410B.2	Channel B+ repetition frequency output
	X410B.3	Channel B– repetition frequency output
	X410B.4	EM-S1INA +/- 10 V or +/- 20 mA analog input
	X410B.5	CAN-Low System bus
	X410B.6	CAN-High System bus
	X410B.7	GND

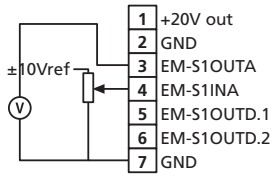
EM-ENC-03

Terminal board X410A	Terminal	Function
	X410A.1	Channel A+ speed sensor input
	X410A.2	Channel A– speed sensor input
	X410A.3	Channel B+ speed sensor input
	X410A.4	Channel B– speed sensor input
	X410A.5	-
	X410A.6	GND
	X410A.7	-

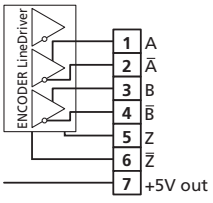
Terminal board X410B	Terminal	Function
	X410B.1	-
	X410B.2	-
	X410B.3	-
	X410B.4	-
	X410B.5	CAN-Low System bus
	X410B.6	CAN-High System bus
	X410B.7	GND

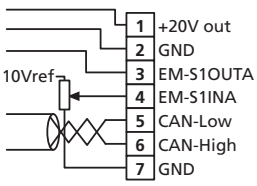
EM-ENC-04

Terminal board X410A	Terminal	Function
	X410A.1	Channel A+ speed sensor input
	X410A.2	Channel A– speed sensor input
	X410A.3	Channel B+ speed sensor input
	X410A.4	Channel B– speed sensor input
	X410A.5	Channel Z+ speed sensor input
	X410A.6	Channel Z– speed sensor input
	X410A.7	+5 V power supply output (200mA)

Terminal board X410B	Terminal	Function
	X410B.1	+20 V power supply output (180 mA)
	X410B.2	Power supply GND
	X410B.3	± 10 V analog output EM-S1OUTA
	X410B.4	EM-S1INA +/- 10 V or +/- 20 mA analog input
	X410B.5	EM-S1OUTD multifunction relay output, U_{max} = 24 V, 1 A (ohmic)
	X410B.6	
	X410B.7	GND

EM-ENC-05

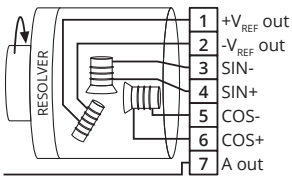
Terminal board X410A	Terminal	Function
	X410A.1	Channel A+ speed sensor input
	X410A.2	Channel A– speed sensor input
	X410A.3	Channel B+ speed sensor input
	X410A.4	Channel B– speed sensor input
	X410A.5	Channel Z+ speed sensor input
	X410A.6	Channel Z– speed sensor input
	X410A.7	+5 V power supply output (200mA)

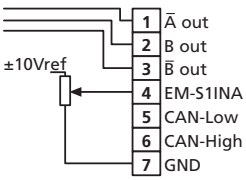
Terminal board X410B	Terminal	Function
	X410B.1	+20 V power supply output (180 mA)
	X410B.2	Power supply GND
	X410B.3	± 10 V analog output EM-S1OUTA
	X410B.4	EM-S1INA +/- 10 V and +/- 20 mA analog input
	X410B.5	CAN-Low System bus
	X410B.6	CAN-High System bus
	X410B.7	GND

RESOLVER MODULE EM-RES-01/EM-RES-02

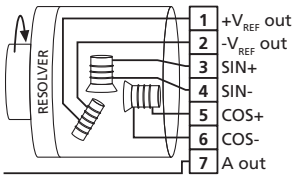
- Resolver evaluation
- Frequency repetition output (Two channels without Zero-Pulse channel)
- Analog input
- System bus

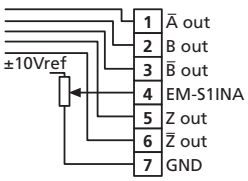
EM-RES-01

Terminal board X410A	Terminal	Function
	X410A.1	(+) ~4 V_{rms} resolver power supply
	X410A.2	(-) (I_{max} = 60 mA)
	X410A.3	Resolver sinθ signal input
	X410A.4	
	X410A.5	Resolver cosθ signal input
	X410A.6	
	X410A.7	Channel A+ Repetition frequency output

Terminal board X410B	Terminal	Function
	X410B.1	Channel A– Repetition frequency output
	X410B.2	Channel B+ Repetition frequency output
	X410B.3	Channel B– Repetition frequency output
	X410B.4	± 10 V or ± 20 mA analog input
	X410B.5	CAN-Low System bus
	X410B.6	CAN-High System bus
	X410B.7	GND

EM-RES-02

Terminal board X410A	Terminal	Function
	X410A.1	(+) ~4 V_{rms} resolver power supply
	X410A.2	(-) (I_{max} = 60 mA)
	X410A.3	Resolver sinθ signal input
	X410A.4	
	X410A.5	Resolver cosθ signal input
	X410A.6	
	X410A.7	Channel A+ Repetition frequency output

Terminal board X410B	Terminal	Function
	X410B.1	Channel A– Repetition frequency output
	X410B.2	Channel B+ Repetition frequency output
	X410B.3	Channel B– Repetition frequency output
	X410B.4	±10 V or ± 20 mA analog input
	X410B.5	Channel Z+ Repetition frequency output
	X410B.6	Channel Z– Repetition frequency output
	X410B.7	GND

MOUNTING OF STANDARD DEVICES

A wide range of mechanical accessories is available for Active series frequency inverters, to make installation as easy as possible in all sorts of applications.

In standard mountings the unit can be installed directly on the mounting plate or through-the-wall with optional mounting equipment. A vibration-proof mounting variant and a standard DIN bar mounting variant are also available.

The range of mounting variants also includes an optional support with shielded brackets, so that the right solution for all possible needs can always be found.

Installations are almost identical for all sizes, so the examples shown below can be taken as representative solutions and ideal for all installers seeking a mechanically simple, compact installation solution.

Types of mounting kits

The drive is supplied complete for fixing to an electrical cabinet mounting panel.
3 optional installation kits are additionally available.

MSTD (Standard Mounting Kit)
The Standard Mounting Kit is always included for devices for mounting version “A”.

MPSV
Thru-type assembly for higher protection classes or enhanced cooling characteristics.

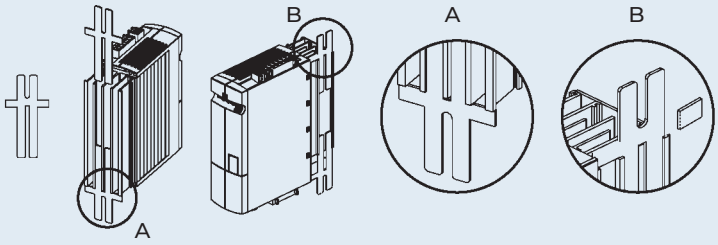
MNVIB
Anti-vibration mounting for installations on machines that generate significant vibrational stress.

MDIN
DIN rail assembly for fast and modular installation / coupling.

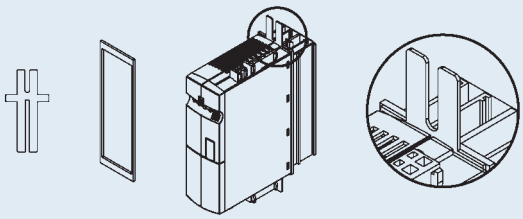
MOUNTING OF SIZE 1

Active	Mounting	Description
210-xx 1 ... **410-xx 1 ...**	Standard	Standard mounting
	MPSV1	Thru-type mounting
	MNVIB1	Antivibration mounting
	MDIN1	DIN rail mounting

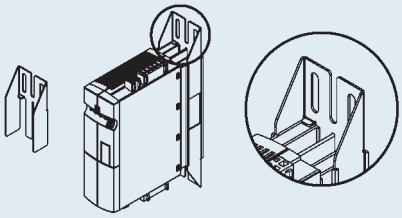
MSTD1-2
(STANDARD MOUNTING)



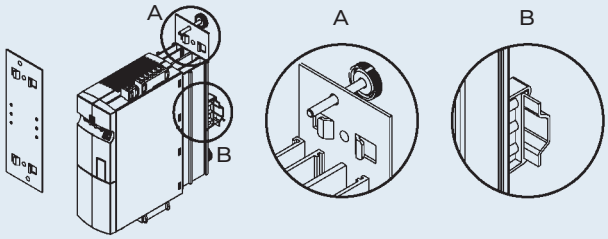
MPSV1



MNVIB1



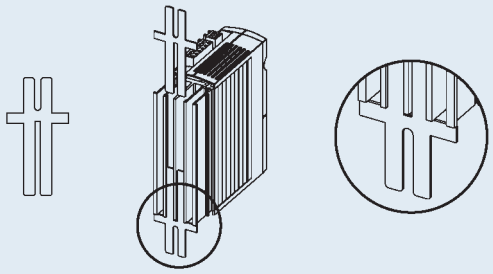
MDIN1



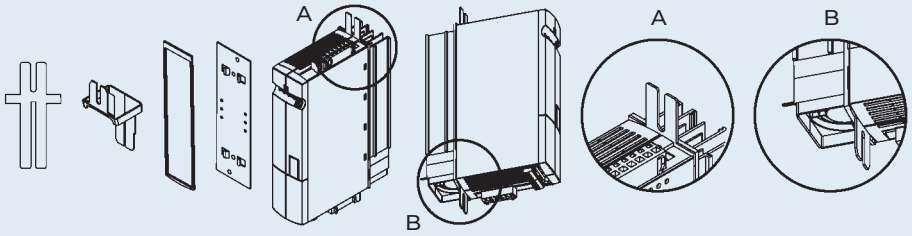
MOUNTING OF SIZE 2

Active	Mounting	Description
210-xx 2 ... **410-xx 2 ...**	Standard	Standard mounting
	MPSV2	Thru-type mounting
	MNVIB2	Antivibration mounting
	MDIN2	DIN rail mounting

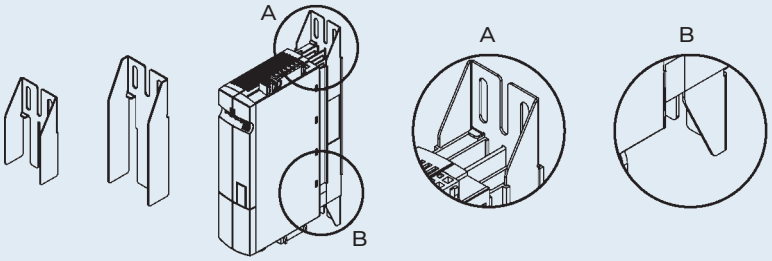
MSTD1-2
(STANDARD MOUNTING)



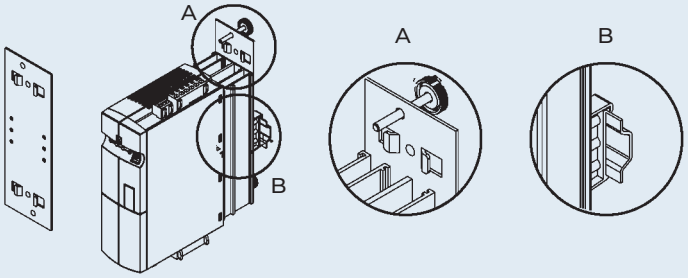
MPSV2



MNVIB2



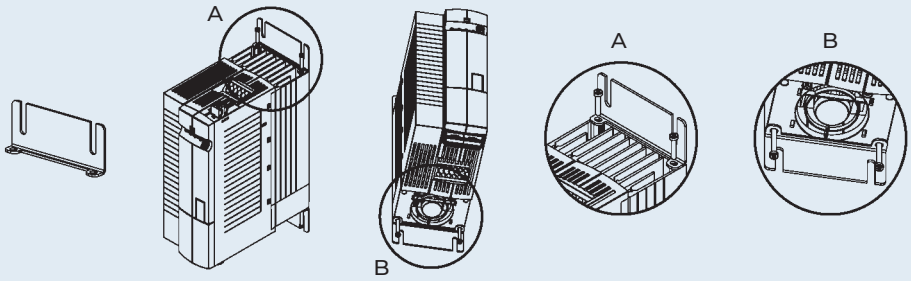
MDIN2



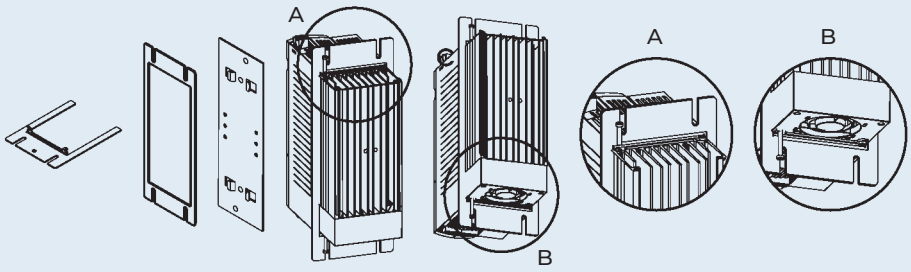
MOUNTING OF SIZE 3

Active	Mounting	Description
210-xx 3 ... **410-xx 3 ...**	Standard	Standard mounting
	MPSV3	Thru-type mounting
	MNVIB3	Antivibration mounting

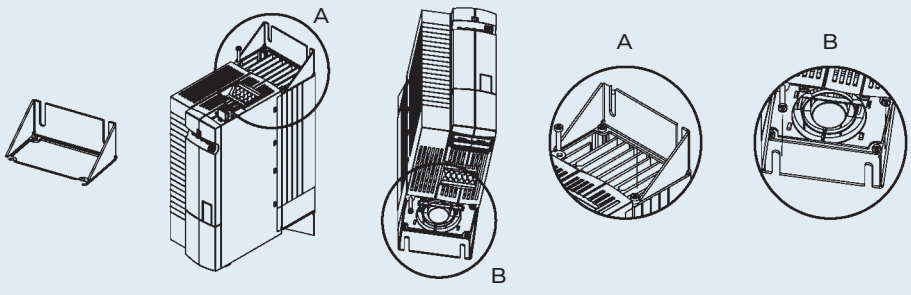
MSTD3
(STANDARD MOUNTING)



MPSV3



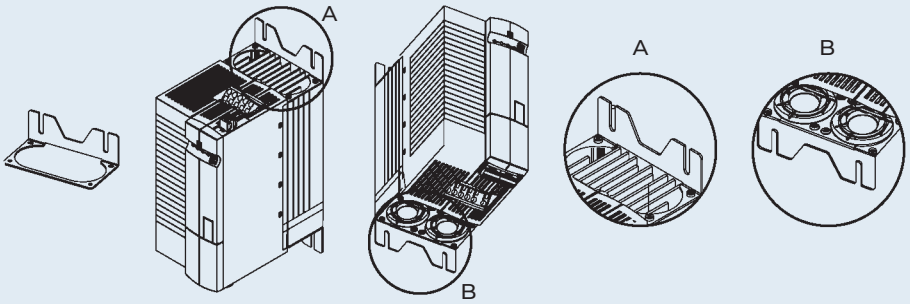
MNVIB3



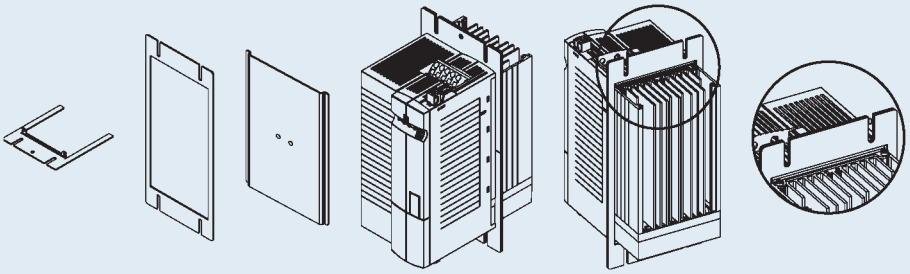
MOUNTING OF SIZE 4

Active	Mounting	Description
210-xx 4 ... **410-xx 4 ...**	Standard	Standard mounting
	MPSV4	Thru-type mounting
	MNVIB4	Antivibration mounting

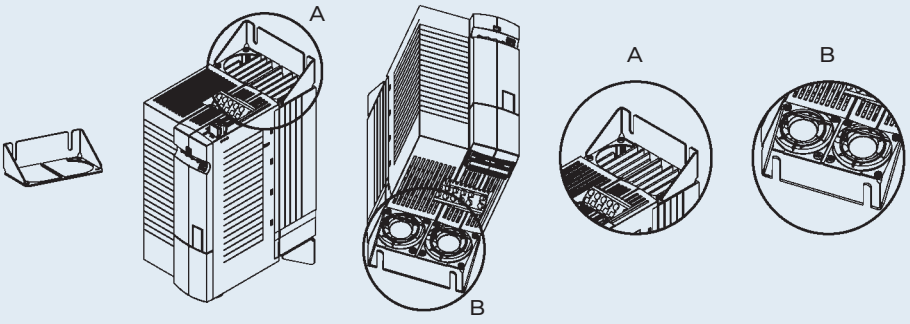
MSTD4
(STANDARD MOUNTING)



MPSV4



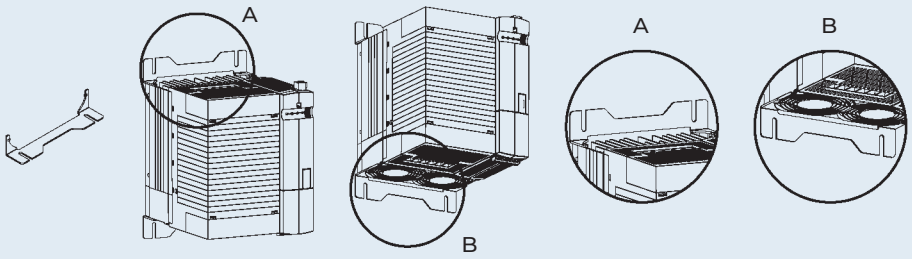
MNVIB4



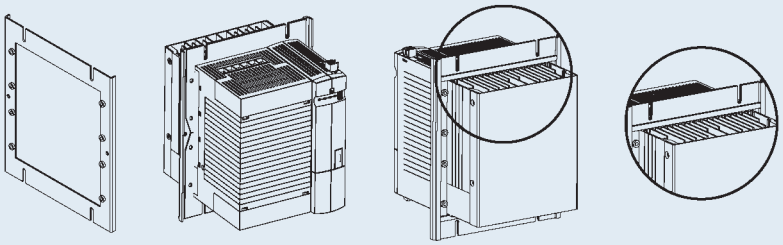
MOUNTING OF SIZE 5

Active	Mounting	Description
410-xx 5 ...	Standard	Standard mounting
	MPSV5	Thru-type mounting
	MNVIB5	Antivibration mounting

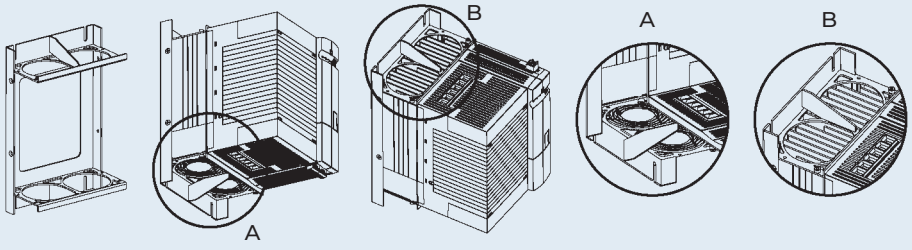
MSTD5
(STANDARD MOUNTING)



MPSV5



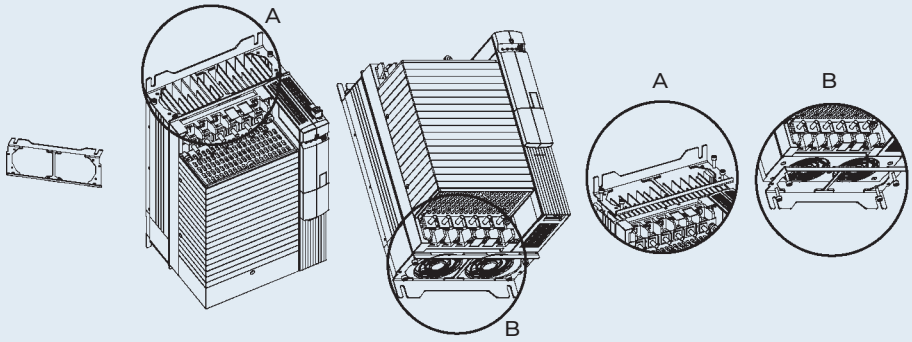
MNVIB5



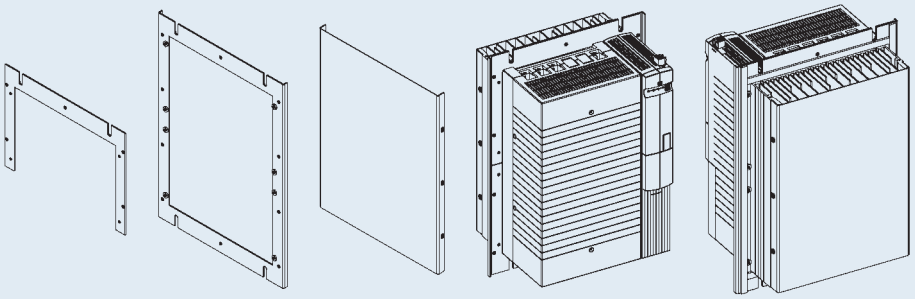
MOUNTING OF SIZE 6

Active	Mounting	Description
410-xx 6 ...	Standard	Standard mounting
	MPSV6	Thru-type mounting
	MNVIB6	Antivibration mounting

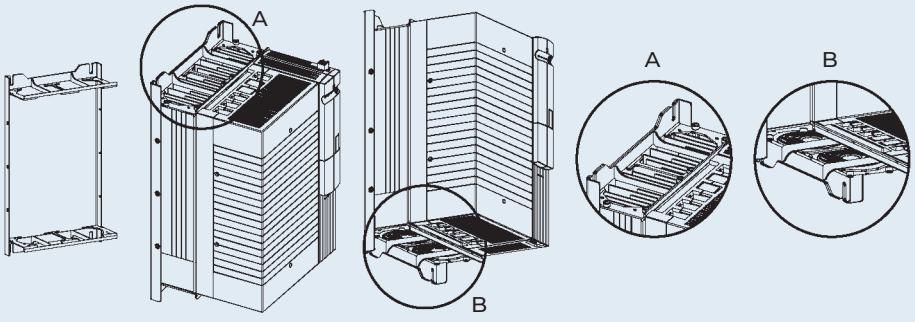
MSTD6
(STANDARD MOUNTING)



MPSV6



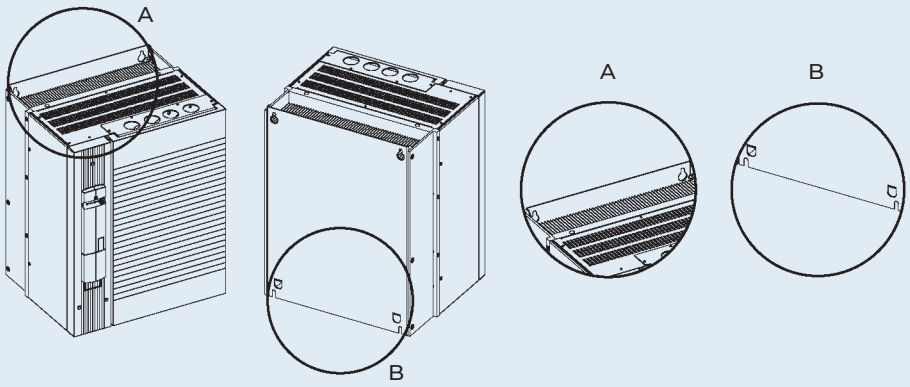
MNVIB6



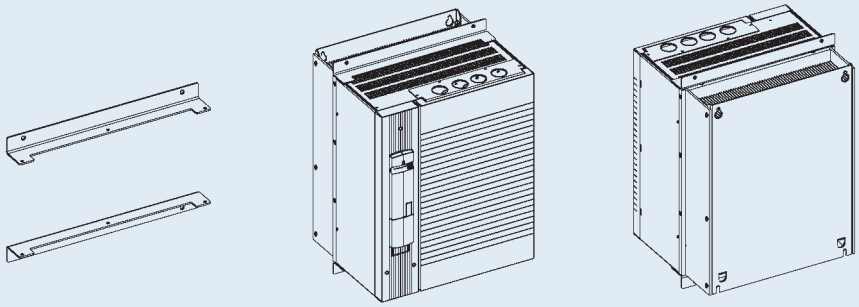
MOUNTING OF SIZE 7

Active	Mounting	Description
410-xx 7 ...	Standard	Standard mounting
	MPSV7	Thru-type mounting

MSTD7
(STANDARD MOUNTING)



MPSV7



INPUT FILTER

Why an input filter?

An Input Filter is a filtration device to be installed up-line from the frequency inverter and down-line from the power feeding contactor.
The AC/DC rectifier at the inverter input generates harmonic disturbance on the absorbed current and emits disturbance generated by switching components towards the mains.
This harmonic current causes voltage distortions on the mains resulting in electromagnetic interference phenomena.
This harmonic distortion is reduced by means of line chokes, while disturbance is countered with EMC filters (attenuation of EMC voltages) such as those described below.

Note: the use of input filters reduces the inverter input voltage. If required, these filters should be installed up-line from the inverter in the following order:

1. Mains supply 2. Line choke 3. EMC filter 4. Inverter

EMC Standards

The standard EN 61800-3 defines the EMC levels for drive systems and for machinery. Depending on the EMC environment different solutions on the inverter side are available to achieve the required EMC level.

Line choke

- The use of Line chokes depends on the system engineer's need to reduce harmonic distortion in the short circuit point and the need to reinforce the action of the EMC filter. A line choke is highly recommended when the PCC (Point of common coupling) of the mains power supply for the drive has an RSC higher than 100.
- A line choke is recommended for the ACT210 and ACT410 frequency inverter series in the presence of high continuous input current required by the application, in order to increase the lifetime of the electrolytic capacitors.
- A line choke is always required in single and two-phase operation of the ACT210 frequency inverters and in size 7. For other devices please check the markings in the technical data tables.

EMC filter

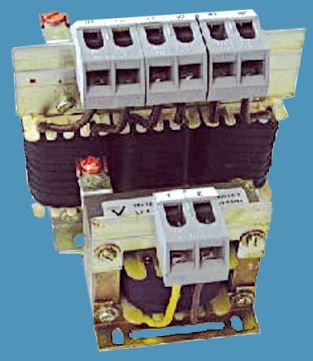
- An EMC filter can be used in order to achieve Class C3, C2 or C1 interference suppression.
- The EMC filter is available in a low leakage current version for special applications.
- The EMC - filter is part of the standard outfit in mechanical sizes 1 & 2 and it is supplied as an internal option in mechanical size 3 and external option in size 3 and bigger.

Active inverter - Line choke / EMC filter combination

EN 55011	Compliance with CLASS A (GROUP 2)		Compliance with CLASS A (GROUP 1)		Compliance with CLASS B	
EN61800-3	Compliance with CATEGORY C3		Compliance with CATEGORY C2		Compliance with CATEGORY C1	
Motor cable length	< 10 m	< max*	< 10 m	< max*	< 10 m	< max*
ACT size 1 (standard internal filter)	Standard	external choke	Standard	external filter	external choke	external filter
ACT size 2 (standard internal filter)	Standard	external choke	Standard	external filter	external choke	external filter
ACT size 3	internal filter or external choke	internal filter or external choke	internal filter + external choke	internal filter + external choke	internal filter + external choke	external filter
ACT size 4	external choke	external choke	external filter	external filter	external filter	external filter + external choke
ACT size 5	external choke	external choke	external filter	external filter	external filter	external filter + external choke
ACT size 6	external choke	external choke	external filter	external filter	external filter	external filter
ACT size 7	external choke	external filter	external filter	external filter	—	—

** See the operation manual*

LINE CHOKE



The simplest way of reducing high harmonic components and hence reactive power is connecting a choke in series on the mains side of the inverter. Depending on the system, reactive power consumption can be reduced by approximately 20% of the figure without line choke.

The line choke increases inductance towards the mains. Mains feed line choke can be regarded as sufficient if short-circuit power is from 20 to 40 times higher than the inverter nominal output.

The inverter is suitable for connection to public or industrial mains supplies in compliance with technical data. If the supply mains transformer output is ≤ 500 kVA, the optional mains choke is needed only if specified in the inverter technical data. The other inverters are suitable for the connection to the mains without a mains choke with relative impedance ≥ 1%. If it is desired to connect more than one inverter, use the sum of the nominal outputs as a basis.

Since experience has shown that the nominal short circuit power on the inverter connection point is often unknown, BONFIGLIOLI recommends the use of mains chokes with 4% relative short circuit voltage.

The relative short circuit voltage equivalent to a 4% voltage drop represents the percentage of the nominal voltage at which a current equal to rated current flows in the case of a short circuit.

The line choke must be installed between the mains connection point and the EMC filter. Both the line choke and inverter should be installed on a common metal baseplate and each should be connected to the metal mounting plate and earthed by means of a large contact area copper braid.

Technical data

Mains voltage
- 230V +/- 10%
- 400V +/- 10%

Frequencies
- 50/60 Hz
- uk (a IN / 50 Hz) 4%

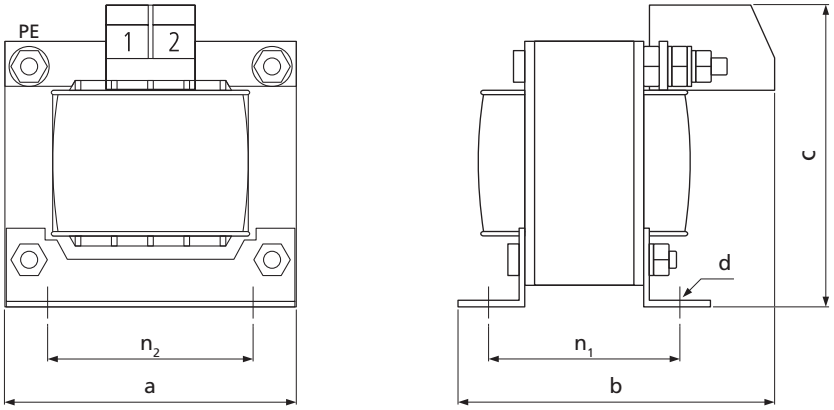
Insulating material class
- T40/F

Ambient temperature
- 40°C

Protection degree (EN 60529)
- IP00

Connection type
- Contact-protected terminals

LCVS006 ... LCVS018



Technical data

Bonfiglioli frequency inverter - Line choke combination, **1x230 V~**

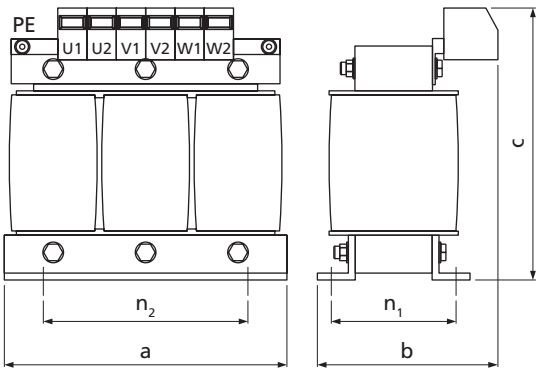
Inverter type	Line choke	Nominal current	Power dissipation
		[A]	[W]
ACT 210-05	LCVS006	6	8.0
ACT 210-07	LCVS008	8	8.0
ACT 210-09	LCVS010	10	10.0
ACT 210-11	LCVS015	15	12.0
ACT 210-13	LCVS018	18	15.0

Technical assembly data

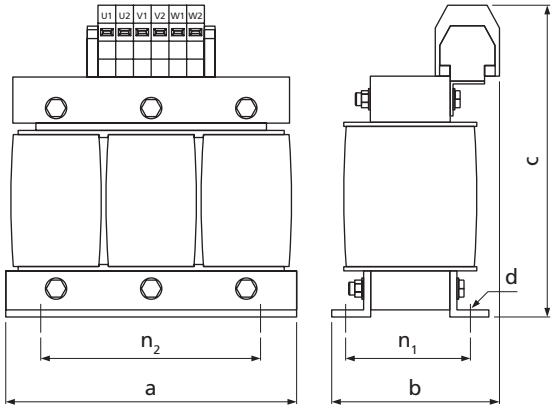
Line choke	Dimensions			Assembly			Weight	Connection terminal		
	a	b	c	n_2	n_1	d	kg	mm	Nm	PE
LCVS006	60	62	75	44	38	3.6	0.5	0.75-2.5	1.0-1.2	2.5 mm^2
LCVS008	60	67	75	44	43	3.6	0.6	0.75-2.5	1.0-1.2	2.5 mm^2
LCVS010	66	80	70	50	51	4.8	0.8	0.75-2.5	1.0-1.2	M4
LCVS015	78	78	80	56	49	4.8	1.1	0.75-4.0	1.5-1.8	M4
LCVS018	85	85	95	64	50	4.8	1.8	0.75-4.0	1.5-1.8	M4

LINE CHOKE

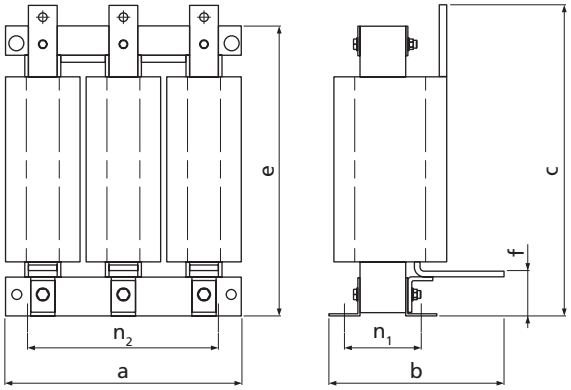
LCVT004 ... LCVT025



LCVT034 ... LCVT250



LCVT280AL-xxx ... LCVT690AL-xxx



Technical data

Bonfiglioli frequency inverter – Line choke combination, **3x230 V~**

Inverter type	Line choke	Nominal current	Choke	Power dissipation
		[A]	[mH]	[W]
ACT 210-05	LCVT004	4	7.32	20
ACT 210-07				
ACT 210-09	LCVT006	6	4.88	25
ACT 210-11	LCVT008	8	3.66	30
ACT 210-13	LCVT010	10	2.93	30
ACT 210-15	LCVT015	15	1.95	45
ACT 210-18	LCVT018	18	1.63	70
ACT 210-19	LCVT025	25	1.17	70
ACT 210-21	LCVT034	34	0.86	85
ACT 210-22				

Technical data

Bonfiglioli frequency inverter – Line choke combination, **3x400 V~**

Inverter type	Line choke	Nominal current	Choke	Power dissipation
		[A]	[mH]	[W]
ACT 410-05	LCVT004	4	7.32	20
ACT 410-07				
ACT 410-09				
ACT 410-11				
ACT 410-12				
ACT 410-13	LCVT006	6	4.88	25
ACT 410-15	LCVT008	8	3.66	30
ACT 410-18	LCVT010	10	2.93	30
ACT 410-19	LCVT015	15	1.95	45
ACT 410-21	LCVT018	18	1.63	70
ACT 410-22	LCVT025	25	1.17	70
ACT 410-23	LCVT025	25	0.86	85
ACT 410-25	LCVT034	34	0.86	85
ACT 410-27	LCVT050	50	0.59	100
ACT 410-29	LCVT060	60	0.49	100
ACT 410-31				
ACT 410-33	LCVT075	75	0.37	110
ACT 410-35	LCVT090	90	0.33	120
ACT 410-37	LCVT115	115	0.25	140
ACT 410-39	LCVT135	135	0.22	180
ACT 410-43	LCVT160	160	0.18	180
ACT 410-45	LCVT180	180	0.16	185
ACT 410-47	LCVT210	210	0.14	200
ACT 410-49	LCVT250	250	0.12	210

LINE CHOKE

Technical assembly data

Line choke	Dimensions			Assembly			Weight	Connection terminal		
	a	b	c	n_2	n_1	d	kg	mm	Nm	PE
LCVT004	80	65	95	55	37	4	0.8	0.75-2.5	1.0-1.2	4 mm^2
LCVT006	100	65	115	60	39	4	1.0	0.75-2.5	1.0-1.2	4 mm^2
LCVT008	100	75	115	60	48	4	1.5	0.75-2.5	1.0-1.2	4 mm^2
LCVT010	100	75	115	60	48	4	1.5	0.75-2.5	1.0-1.2	4 mm^2
LCVT015	125	85	135	100	55	5	3.0	0.75-4.0	1.5-1.8	4 mm^2
LCVT018	155	90	135	130	57	8	4.0	0.75-4.0	1.5-1.8	4 mm^2
LCVT025	155	100	160	130	57	8	4.0	0.75-10	4.0-4.5	4 mm^2
LCVT034	155	100	190	130	57	8	4.5	2.5-16	2.0-4.0	M5
LCVT050	155	115	190	130	72	8	4.5	2.5-16	2.0-4.0	M5
LCVT060	190	110	220	170	58	8	9.0	2.5-35	2.5-5.0	M5
LCVT075	190	120	250	170	68	8	12	25-50	3.0-6.0	M6
LCVT090	190	130	250	170	78	8	12	25-50	3.0-6.0	M6
LCVT115	210	140	270	180	82	8	14	25-50	3.0-6.0	M6
LCVT135	240	160	300	190	100	11	20	16-70	6.0-7.0	M8
LCVT160	240	160	310	190	100	11	20	50-95	6.0-12.0	M8
LCVT180	240	175	320	190	106	11	22	50-95	6.0-12.0	M8
LCVT210	240	200	335	190	121	11	26	95-150	10.0-20.0	M8
LCVT250	240	210	350	190	126	11	28	95-150	10.0-20.0	M8

EMC FILTERS

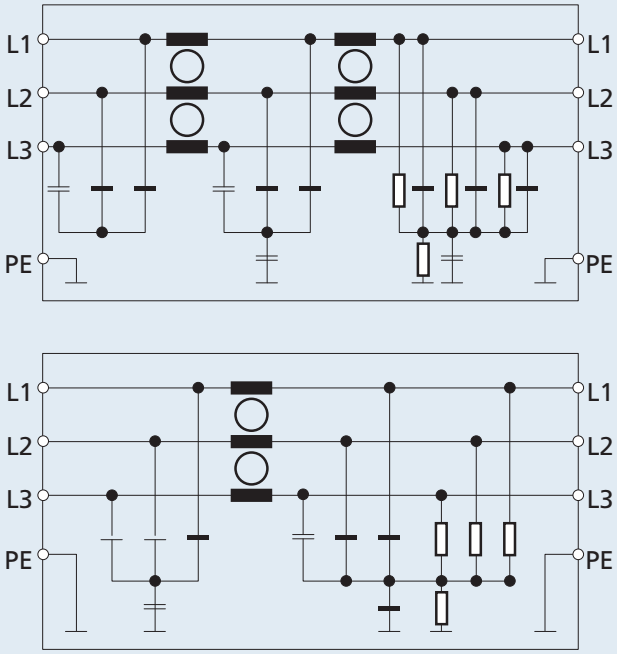
Because of their intrinsic characteristics, all frequency inverters often generate undesired high frequency voltages generally referred to as “interference”. EMC filters are installed on the mains side to reduice this interference.
The reference standard EN EN61800-3 defines the thresholds for electromagnetic interference for different classes of equipment.

Active series frequency inverters up to size 9.2 kW can be ordered with a built-in EMC filter conforming to the requirements of the standard for “Category C2” environments.
Two series of external EMC filters are available for larger size Active frequency inverters and for installations where conformity to the requirement “Category C1” necessary. The two series differ both in construction and power range.

The first set of filters are “backplate filters or foot print”. They are available in sizes 18 and 40 A (suitable for Active frequency inverters in frame sizes 3 and 4), and allow the frequency inverter to be installed on board the filter itself. The second series of filters are “book filters”. They cover all other Active sizes up to 250 A and are designed for installation on the same mounting panel alongside the drive.

Mains filters with very low dispersion currents are available upon request for specific applications.

Basic circuit diagram



BACKPLATE EMC FILTERS

Mains voltage
- 3 x 480V~ maximum +10%

Nominal current
- 8A ... 40A

Frequency
- 50/60 Hz

Operating and storage temperature
- -25 °C ... +100 °C (climate class acc. to EN60721-3-3)

Ambient temperature
- +40°C maximum

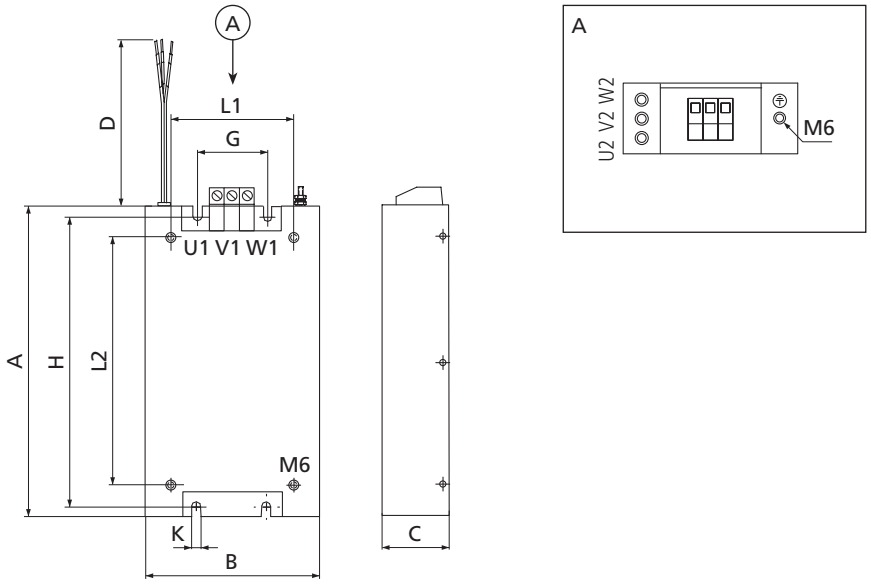
Protection degree (EN 60529)
- IP00

Connection type
- Contact-protected terminals
- Strand connection on load side (only up to ACT 410-18)
- Metal fasteners are included in the supply

Note
These mains filters are installed between the line choke and the frequency inverter. The frequency inverter installed on the EMC filter must be connected to the metal baseplate with a short, large section earth connection.
Overload capacity is 1.5 times rated current for 1 minute, every 30 minutes.

Inverter type		EMC filter	Rated current	Leakage current	Power dissipation	Weight
Size	Type		[A]	[mA]	[W]	[kg]
3	**ACT 410-19** **ACT 410-21**	FTV018B	18	1.5	20	3.5
4	**ACT 410-23** **ACT 410-25**	FTV040B	40	1.2	35	3.5

Dimensions FTV018B - FTV040B



EMC filter	A	B	C	D	G	H	K	L1	L2
FTV018B	315	100	65	300	35	300	6.3	76	270
FTV040B	315	125	65	300	60	300	6.3	125	270

BOOK TYPE EMC FILTERS

Mains voltage
- 3 x 480 VAC

Rated current
- 7 A ... 250 A

Frequency
- up to 60 Hz

Operating and storage temperature
- -25 °C ... +80 °C (climate class acc. to EN60721-3-3)

Protection degree (EN 60529)
- IP20

Maximum length of motor cables:
- ACT 410-05 to -15: 25 m class B
- ACT 410-18 to -25: 50 m class B
- ACT 410-27 to -39: 10 m class B, 100 m class A group 1
- ACT 410-43 to -49: 10 m class B, 100 m class A group 1

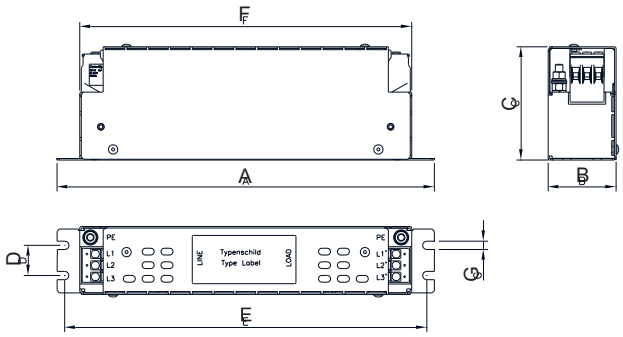
Note
Overload capacity is 4 times rated current at switch-on; 1.5 times rated current for 1 minute, once per hour.

Inverter type		EMC filter	Rated current	Leakage current	Power dissipation	Weight
Size	Type		[A]	[mA]	[W]	[kg]
1	**ACT 210-05**	HLD 110-500/8	8	20	6	0.8
	ACT 210-07					
	ACT 210-09					
	ACT 410-05					
	ACT 410-07					
	ACT 410-09					
	ACT 410-11					
2	**ACT 210-11**					
	ACT 410-12					
	ACT 410-13					
	ACT 410-15					
	ACT 210-13	HLD 110-500/16	16	21	12	1.2
	ACT 210-15					
	ACT 410-18					
3	**ACT 410-19**					
	ACT 410-21					
	ACT 210-18	HLD 110-500/30	30	29	15	1.6
	ACT 210-19					
	ACT 410-22					
4	**ACT 210-21**					
	ACT 410-23					
	ACT 410-25					
	ACT 210-22	HLD 110-500/42	42	30	22	2.0

Inverter type		EMC filter	Rated current	Leakage current	Power dissipation	Weight
Size	Type		[A]	[mA]	[W]	[kg]
5	**ACT 410-27**	HLD 110-500/42	42	30	22	2.0
	ACT 410-29	HLD 110-500/55	55	30	30	2.6
	ACT 410-31	HLD 110-500/75	75	22	35	3.8
6	**ACT 410-33**	HLD 110-500/100	100	30	60	5.1
	ACT 410-35					
	ACT 410-37	HLD 110-500/130	130	22	90	5.6
	ACT 410-39					
7	**ACT 410-43**	HLD 110-500/180	180	31	150	9.5
	ACT 410-45					
	ACT 410-47	HLD 110-500/250	250	37	180	12.7
	ACT 410-49					

BOOK TYPE EMC FILTERS

Dimensions HLD 110-500/8 ... HLD 110-500/250



EMC filter	A	B	C	D	E	F	G
HLD 110-500/8	190	45	75	20	180	166	M5
HLD 110-500/16	250	45	75	20	240	220	M5
HLD 110-500/30	270	55	95	30	255	240	M5
HLD 110-500/55	250	85	95	60	235	255	M5
HLD 110-500/75	270	85	135	60	255	310	M6
HLD 110-500/100	270	95	150	65	255	325	M6
HLD 110-500/130	270	95	150	65	255	325	M6
HLD 110-500/180	380	130	181	102	365	440	M6
HLD 110-500/250	450	155	220	125	435	525	M6

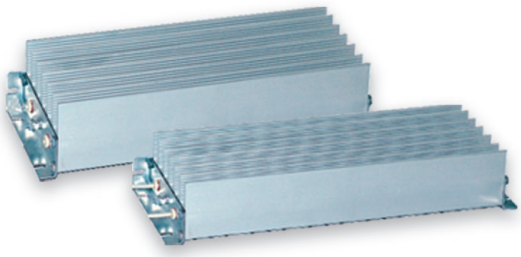
BRAKING RESISTORS

When speed of an inverter-controlled AC motor is reduced, the motor acts as a generator, feeding back energy to the frequency inverter. As a result, voltage in the intermediate circuit of the inverter increases. When a specific threshold is exceeded, the energy must flow to an external braking system in order to avoid drive failures. Braking resistors are designed to absorb such energy and to dissipate it into heating. The use of brake resistors allows drives to fulfil the requirements of particularly severe duty cycles, for example those featured by frequent braking, long lasting braking or impulsive braking.

Bonfiglioli offers a wide range of safe and compact braking resistors with IP20 degree of protection: “BR series”.

BR series are designed for panel mounting.

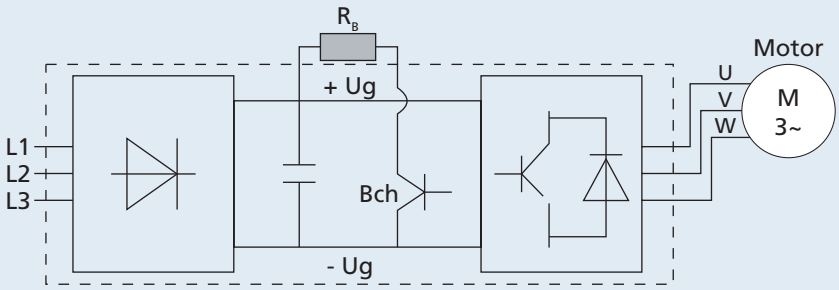
Depending on the brake resistors these are equipped with a thermal switch (see selection table for details).



Connection diagram

R_B = external braking resistor

Bch = brake chopper integrated in standard Active inverter

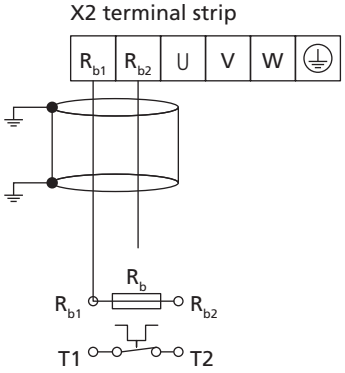


Connection terminals

The R_{b1} and R_{b2} braking resistor terminals on Active frequency inverters are located on the X2 power output terminal strip. Access to these terminals on sizes 1 to 4 units is made even easier by the use of disconnectable power terminal strips. Refer to the manual provided with your frequency inverter for further details on materials and connection methods.

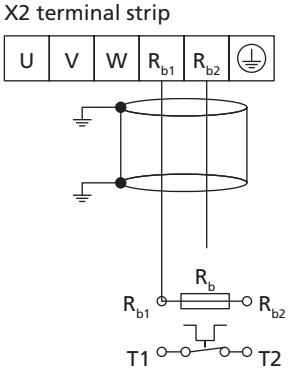
Frequency inverter (up to 4.0 kW)

X2 terminal strip



Frequency inverter (from 5.5 to 132 kW)

X2 terminal strip



Active drive combination chart

These charts show recommended combinations for each model in the Active range, and specify the corresponding duty cycles on the basis of rated drive power. Contact your nearest Bonfiglioli Drive Centre for particularly heavy-duty braking applications or if you need to customise a product.

Inverter type		Bonfiglioli braking resistor	Resistance	Continuous rated power	Duty cycle at the drive's rated power
	kW		Ohm	[W]	[%]
ACT 210-05	0.55	BR 160/100	100	160	29%
ACT 210-07	0.75	BR 160/100	100	160	21%
ACT 210-09	1.1	BR 160/100	100	160	15%
ACT 210-11	1.5	BR 432/37	37	432	29%
ACT 210-13	2.2	BR 432/37	37	432	20%
ACT 210-15	3	BR 432/37	37	432	14%
ACT 210-18	4	BR 667/24	24	667	17%
ACT 210-19	5.5	BR 667/24	24	667	12%
ACT 210-21	7.5	BR 1333/12	12	1333	18%
ACT 210-22	9.2	BR 1333/12	12	1333	14%
ACT 410-05	0.55	BR 213/300	300	213	39%
ACT 410-07	0.75	BR 213/300	300	213	28%
ACT 410-09	1.1	BR 213/300	300	213	19%
ACT 410-11	1.5	BR 213/300	300	213	14%
ACT 410-12	1.85	BR 471/136	136	471	25%
ACT 410-13	2.2	BR 471/136	136	471	21%
ACT 410-15	3	BR 471/136	136	471	16%
ACT 410-18	4	BR 696/92	92	696	17%
ACT 410-19	5.5	BR 1330/48	48	1330	24%
ACT 410-21	7.5	BR 1330/48	48	1330	18%
ACT 410-22	9.2	BR 1330/48	48	1330	14%
ACT 410-23	11	BR 2000/32	32	2000	18%
ACT 410-25	15	BR 2000/32	32	2000	13%
ACT 410-27	18.5	BR 4000/16	16	4000	22%
ACT 410-29	22	BR 4000/16	16	4000	18%
ACT 410-31	30	BR 4000/16	16	4000	13%
ACT 410-33	37	BR 8000/7	7.5	8000	22%
ACT 410-35	45	BR 8000/7	7.5	8000	18%
ACT 410-37	55	BR 8000/7	7.5	8000	15%
ACT 410-39	65	BR 8000/7	7.5	8000	12%
ACT 410-43	75	BR8000/7	7.5	8000	11%
ACT 410-45	90	BR8000/7	7.5	8000	9%
ACT 410-47	110	2xBR8000/7	3.75	16000	15%
ACT 410-49	132	2xBR8000/7	3.75	16000	12%

For further information refer to the Bonfiglioli braking resistor catalogue.

OUR GLOBAL PRESENCE

Thanks to an international network of closely interconnected commercial and production sites, we can guarantee the same high standards of Bonfiglioli quality anywhere at any given time. We know that our direct presence in local markets is the key to long-lasting success, so our family includes 17 production sites, 23 commercial sites and more than 550 distributors around the world.

Our organization is always close by, offering complete and efficient solutions and supporting our customers with dedicated services, co-engineering and after-sales assistance.

17
PRODUCTION SITES

23
COMMERCIAL SITES

80
COUNTRIES

550
DISTRIBUTORS

~5,000
PEOPLE

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PRODUCTION ASSEMBLY SALES SERVICE

Bonfiglioli

We have a relentless commitment to excellence, innovation & sustainability. Our team creates, distributes and services world-class power transmission & drive solutions to keep the world in motion.

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