

Products 2016

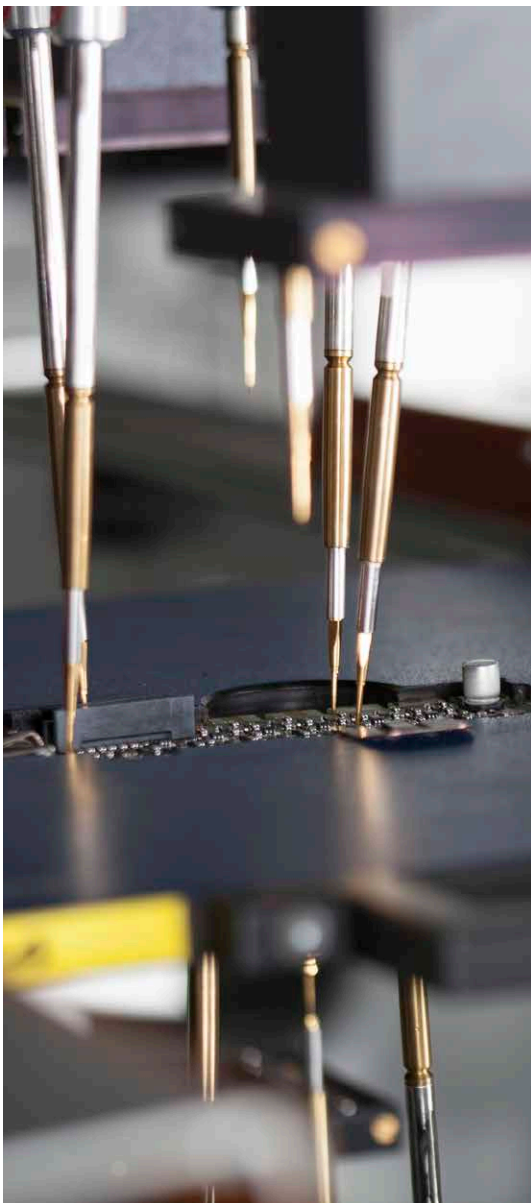
Control, HMI and Motion

Control, HMI and Motion

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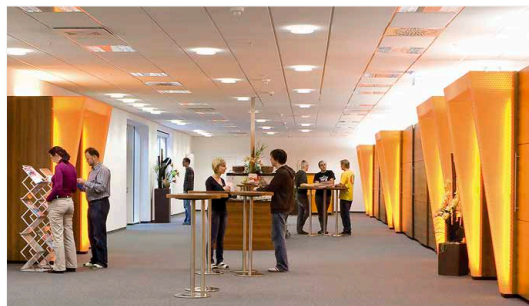
About B&R



We hold our products to standards of quality that far exceed what the industry requires. The equipment we use for testing is developed in-house.



The B&R headquarters in Eggelsberg, Austria is where we produce every single product in our portfolio, and it is also where we perform all research and development. Our philosophy of coupling R&D and production at a central location has helped us sustain an exceptional level of innovation year after year.



The modular training programs held in our Automation Academy continually expand the skills and expertise of our customers and employees in the field of automation technology.



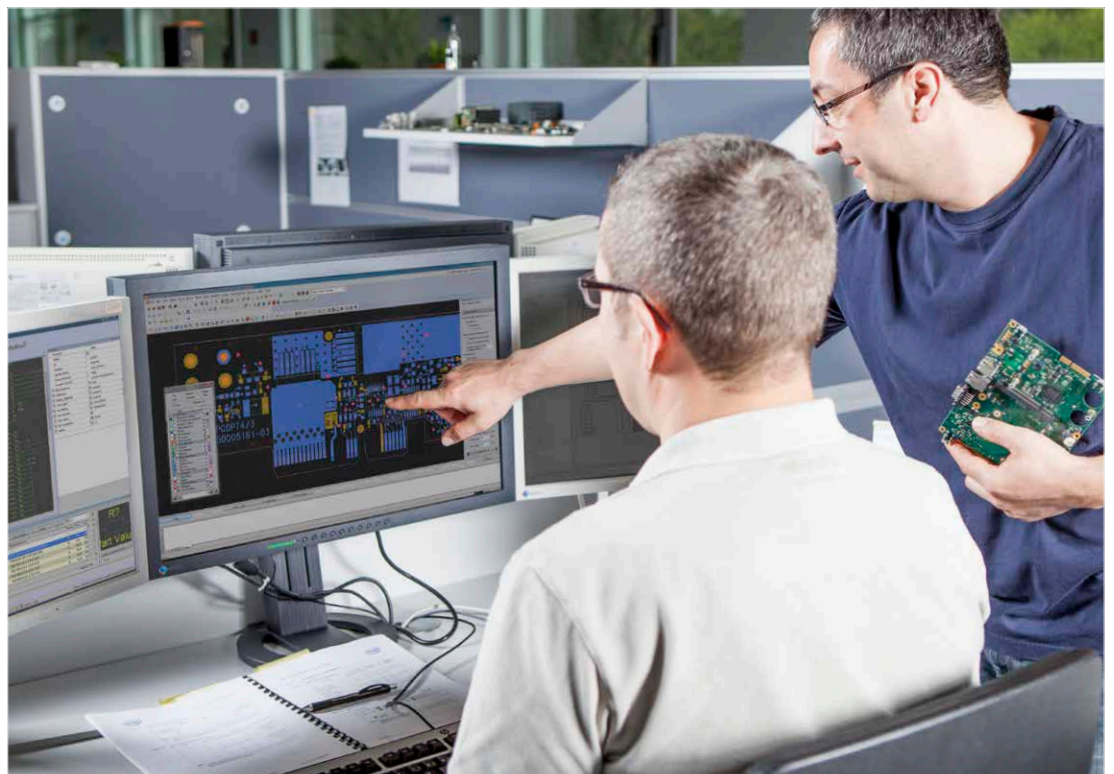
Each and every component is subjected to in-circuit testing and comprehensive functional testing prior to shipping.



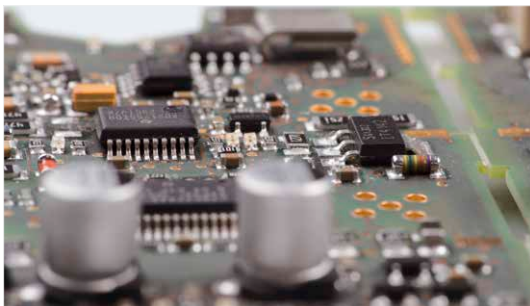
In our accredited environmental testing lab, we ensure that our products perform flawlessly under any conditions. This guarantees that all B&R technology lives up to our impeccable standards.



Our X20 assembly line allows us to offer our customers fully assembled control units, ready to install and switch on right out of the box, with the added benefit of increased process reliability.



B&R's wealth of automation know-how is embodied in more than 1,000 engineers working in hardware/software R&D, ECAD and MCAD, application development and sales. Customers profit from our highly qualified support, team-oriented partnership and strong international presence.



100% vertical integration – from the circuit board to the fully configured automation system – guarantees maximum flexibility for future developments.



The entire complex in Eggelsberg, with a total of 10,000 data points, is automated by B&R's APROL process control system.



The fully automated production cells ensure both high quality and short processing times.




X20 system

Slice-based control and I/O system

As a control system with a large selection of CPUs or as an I/O system used to expand existing control systems via standard fieldbus systems, the X20 system is extremely versatile.














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Product overview

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Integrated safety technology - X20 system

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Product overview



reACTION technology

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Integrated safety technology - Accessories



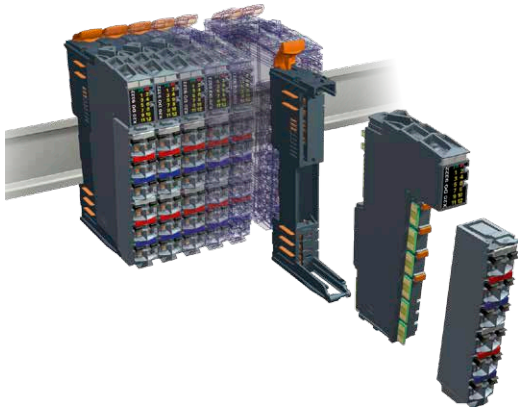
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Setting the standards in automation

There are many different I/O slice systems. With the X20 system, B&R continues to set groundbreaking standards in accordance with our motto "Perfection in Automation". Born from experience gained from applications all over the world, numerous conversations with customers and with the aim for easier, more economical and secure usage, the X20 system is a universal solution for any automated task in machine and system manufacturing.

More than just I/O

With its well thought-out details and a sophisticated ergonomic design, the X20 system is more than a remote I/O system – it's a complete control solution. The X20 system family makes it possible to combine the exact components needed to meet any application requirements.

- The X20 system is the ideal addition to a standard fieldbus and expands the possibilities of conventional control systems. Simply connect it, configure it and you're done.
- Teamed up with other B&R components, the X20 system achieves its full potential and allows the implementation of applications with unimagined performance and flexibility. Take advantage of seamless integration.

3 x 1 = 1

Three basic elements make up one module: Terminal block – Electronics module – Bus module
This modularity results in a system that combines the advantages of both rack and I/O slice systems:

- Prewiring without the module
- Hot pluggable electronics
- Extra bus slots for added options

The X20 system delivers 50% more component density, perfected connection technology and optimal granularity.

Added value

12 channels with a width of 12.5 mm allow a component density never before achieved with optimal terminal ergonomics. As a result, the X20 system offers 50% more channels than conventional slice systems. And this without sacrificing terminal connections.

Uniformity

Consistent implementation of 1-, 2- or 3-wire connections – no additional jumper terminals needed.

Granularity

One-channel and two-channel modules: Maximum flexibility so you only have to pay for what you really need.

Optimized design

X20 modules consist of three submodules to provide maximum ease of use throughout their entire life cycle. This division into bus module, electronics module and terminal block has several advantages.

Preconfigured for different machine types

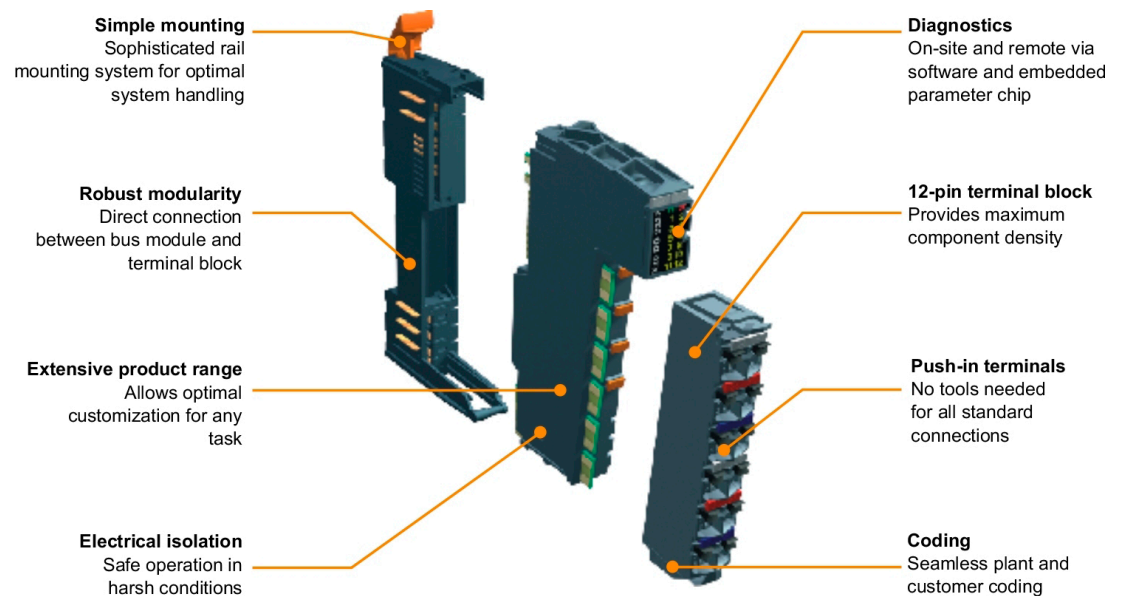
The X20 system bus modules are the basic platform for many machine variations. The design of the machine determines which electronics modules are used. The software automatically recognizes the system configuration and provides all the necessary functionality. Handling a range of different machine variants couldn't be easier.

Industrial control cabinet construction

X20 system terminal blocks are separate from the electronics module and make it possible to pre-wire the entire control cabinet. This is especially ideal for series-produced machines.

Easy maintenance

X20 modules can be easily exchanged to simplify troubleshooting. The electronic modules can be exchanged without interrupting operation. The wiring remains exactly the same thanks to the separate terminal blocks. Being able to exchange the automation components quickly reduces downtime.



Bus modules

X20BM01, X20BM11, X20BM05, X20BM15



Short description	X20BM01	X20BM11	X20BM05	X20BM15
Bus module	Power supply bus module, 24 VDC keyed, internal I/O supply interrupted to the left	Bus module, 24 VDC keyed, internal I/O supply continuous	Power supply bus module with node number switch, 24 VDC keyed, internal I/O supply interrupted to the left	Bus module with node number switch, 24 VDC keyed, internal I/O supply continuous
General information	X20BM01	X20BM11	X20BM05	X20BM15
Power consumption				
Bus			0.13 W	
Internal I/O			-	
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2			Yes	
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL			Yes	
LR			Yes	
GOST-R			Yes	
I/O supply	X20BM01	X20BM11	X20BM05	X20BM15
Nominal voltage			24 VDC	
Permitted contact load			10 A	
Environmental conditions	X20BM01	X20BM11	X20BM05	X20BM15
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Bus modules

X20BM21, X20BM31, X20BM12, X20BM32



Short description	X20BM21	X20BM31	X20BM12	X20BM32
Bus module	Power supply bus module for double-width modules, 24 VDC keyed, internal I/O supply interrupted to the left	Bus module for double-width modules, 24 VDC keyed, internal I/O supply continuous	Bus module, 240 VAC keyed, internal I/O supply continuous	Bus module for double-width modules, 240 VAC keyed, internal I/O supply continuous
General information	X20BM21	X20BM31	X20BM12	X20BM32
Power consumption				
Bus			0.13 W	
Internal I/O			-	
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2	Yes	Yes	Yes	-
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL			Yes	
LR			Yes	
GOST-R			Yes	
I/O supply	X20BM21	X20BM31	X20BM12	X20BM32
Nominal voltage			24 VDC	
Permitted contact load			10 A	
Environmental conditions	X20BM21	X20BM31	X20BM12	X20BM32
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	

¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

Terminal blocks

X20TB06, X20TB12, X20TB32



General information	X20TB06	X20TB12	X20TB32
Certification			
CE		Yes	
cULus		Yes	
ATEX Zone 2 ¹⁾		Yes	
GL		Yes	
LR		Yes	
GOST-R		Yes	
Terminal block	X20TB06	X20TB12	X20TB32
Number of pins	6	12	12
Type of terminal clamp		Push-in terminal	
Push-in force per contact		Typ. 10 N	
Cable type		Only copper wires (no aluminum wires!)	
Wire stripping length		7 to 9 mm	
Connection cross section			
Solid wires		0.08 to 2.50 mm ² / 28 to 14 AWG	
Fine strand wires		0.25 to 2.50 mm ² / 24 to 14 AWG	
With wire end sleeves		0.25 to 1.50 mm ² / 24 to 16 AWG	
With double wire end sleeves		Up to 2x 0.75 mm ²	
Distance between contacts			
Left - Right		4.2 mm	
Above - Below		10.96 mm	
Electrical characteristics	X20TB06	X20TB12	X20TB32
Nominal voltage		240 VAC	
Max. voltage		300 VAC	
Nominal current ²⁾		10 A / contact	
Contact resistance		≤5 mΩ	
Environmental conditions ³⁾	X20TB06	X20TB12	X20TB32
Temperature			
Operation		Corresponds to the X20 module used	

¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

²⁾ Take the respective limit data for the I/O modules into consideration!

³⁾ Identical for operation, storage and transport.

Terminal blocks

X20TB1E, X20TB1F



General information	X20TB1E	X20TB1F
Certification		
CE		Yes
cULus		Yes
ATEX Zone 2 ¹⁾		Yes
GL		Yes
LR		Yes
GOST-R		Yes
Terminal block	X20TB1E	X20TB1F
Number of pins	12	16
Type of terminal clamp		Push-in terminal
Push-in force per contact		Typ. 10 N
Cable type		Only copper wires (no aluminum wires!)
Wire stripping length		7 to 9 mm
Connection cross section		
Solid wires		0.08 to 1.50 mm ² / 28 to 16 AWG
Fine strand wires		0.25 to 1.50 mm ² / 24 to 16 AWG
With wire end sleeves		0.25 to 0.75 mm ² / 24 to 20 AWG
Distance between contacts		
Left - Right		4.2 mm
Above - Below		8.25 mm
Terminal temperature compensation	2x PT1000 integrated in the terminal	-
Electrical characteristics	X20TB1E	X20TB1F
Nominal voltage		24 VDC
Max. voltage		50 VDC
Nominal current ²⁾		2 A / contact
Contact resistance		≤5 mΩ
Environmental conditions ³⁾	X20TB1E	X20TB1F
Temperature		
Operation		Corresponds to the X20 module used

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Take the respective limit data for the I/O modules into consideration!

³⁾ Identical for operation, storage and transport.

CPU modules

X20CP3586, X20CP1586, X20CP3585, X20CP1585



Short description	X20CP3586	X20CP1586	X20CP3585	X20CP1585
Interfaces		1x RS232, 1x Ethernet, 1x POWERLINK (V1/V2), 2x USB, 1x X2X Link		
System module		CPU		
General information	X20CP3586	X20CP1586	X20CP3585	X20CP1585
Cooling			Fanless	
CPU redundancy possible	Yes	No	Yes	No
Power consumption without interface module and USB	9.7 W	9.7 W	8.8 W	8.8 W
Internal power consumption of the X2X Link and I/O supply ¹⁾				
Bus			1.42 W	
Internal I/O			0.6 W	
Certification				
CE			Yes	
cULus			Yes	
ATEX Zone 2 ²⁾			Yes	
KC			Yes	
GL			Yes	
LR	-	Yes	-	Yes
GOST-R			Yes	
CPU and X2X Link supply	X20CP3586	X20CP1586	X20CP3585	X20CP1585
Input voltage			24 VDC -15% / +20%	
Input current			Max. 1.5 A	
Fuse			Integrated, cannot be replaced	
Reverse polarity protection			Yes	
X2X Link supply output	X20CP3586	X20CP1586	X20CP3585	X20CP1585
Nominal output power			7 W ³⁾	
Parallel operation			Yes ⁴⁾	
Redundant operation			Yes	
Input I/O supply	X20CP3586	X20CP1586	X20CP3585	X20CP1585
Input voltage			24 VDC -15% / +20%	
Fuse			Required line fuse: Max. 10 A, slow-blow	
Output I/O supply	X20CP3586	X20CP1586	X20CP3585	X20CP1585
Nominal output voltage			24 VDC	
Permitted contact load			10 A	
Supply - General information	X20CP3586	X20CP1586	X20CP3585	X20CP1585
Electrical isolation				
I/O feed - I/O supply			No	
CPU/X2X Link feed - CPU/X2X Link supply			Yes	

Note: Product photos are not shown to scale.

CPU modules

X20CP3586, X20CP1586, X20CP3585, X20CP1585

Controller	X20CP3586	X20CP1586	X20CP3585	X20CP1585
CompactFlash slot			1	
Real-time clock		Nonvolatile, 1 s resolution, -10 to 10 ppm accuracy at 25°C		
Processor				
Type	Atom™ E680T	Atom™ E680T	ATOM™ E640T	ATOM™ E640T
Clock frequency	1.6 GHz	1.6 GHz	1 GHz	1 GHz
L1 cache				
Data code			24 kB	
Program code			32 kB	
Modular interface slots	3	1	3	1
Remanent variables	Max. 1 MB ⁵⁾	Max. 1 MB ⁵⁾	Max. 256 kB ⁵⁾	Max. 256 kB ⁵⁾
Shortest task class cycle time	100 µs	100 µs	200 µs	200 µs
Typical instruction cycle time	0.0027 µs	0.0027 µs	0.0044 µs	0.0044 µs
Data buffering				
Battery monitoring			Yes	
Lithium battery		Min. 2 years at 23°C ambient temperature		
Standard memory				
RAM	512 MB DDR2 SDRAM	512 MB DDR2 SDRAM	256 MB DDR2 SDRAM	256 MB DDR2 SDRAM
User RAM			1 MB SRAM ⁶⁾	
Interfaces	X20CP3586	X20CP1586	X20CP3585	X20CP1585
IF1 interface				
Signal			RS232	
Design		Connection made using 12-pin X20TB12 terminal block		
Max. distance			900 m	
Transfer rate			Max. 115.2 kbit/s	
IF2 interface				
Signal			Ethernet	
Design			1x RJ45 shielded	
Cable length		Max. 100 m between 2 stations (segment length)		
Transfer rate			10/100/1000 Mbit/s	
Transmission				
Physical layer		10BASE-T/100BASE-TX/1000BASE-T		
Half-duplex			Yes	
Full-duplex			Yes	
Autonegotiation			Yes	
Auto-MDI / MDIX			Yes	
IF3 interface				
Fieldbus		POWERLINK (V1/V2) managing or controlled node		
Type			Type 4 ⁷⁾	
Design			1x RJ45 shielded	
Cable length		Max. 100 m between 2 stations (segment length)		
Transfer rate			100 Mbit/s	
Transmission				
Physical layer			100BASE-TX	
Half-duplex			Yes	
Full-duplex			POWERLINK mode: No / Ethernet mode: Yes	
Autonegotiation			Yes	
Auto-MDI / MDIX			Yes	
IF4 interface				
Type			USB 1.1/2.0	
Design			Type A	
IF5 interface				
Type			USB 1.1/2.0	
Design			Type A	
IF6 interface				
Fieldbus			X2X Link master	

X20CP3586, X20CP1586, X20CP3585, X20CP1585

Environmental conditions	X20CP3586	X20CP1586	X20CP3585	X20CP1585
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20CP3586	X20CP1586	X20CP3585	X20CP1585
Note			Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in delivery	
Dimensions				
Width	200 mm	150 mm	200 mm	150 mm
Height			99 mm	
Depth			85 mm	

¹⁾ The specified values are maximum values. The exact calculation is included as a data sheet in the module documentation and can be downloaded from the B&R website.

²⁾ Ta min.: 0°C

Ta max.: See environmental conditions

³⁾ When operated at temperatures above 55°C, a derating of the nominal output power to 5 W for the X2X Link supply must be taken into consideration.

⁴⁾ In parallel operation, only 75% of the nominal power can be assumed. It is important to make sure that all power supplies operated in parallel are switched on and off at the same time.

⁵⁾ Can be configured in Automation Studio.

⁶⁾ 1 MB SRAM minus the configured remanent variables.

⁷⁾ See the POWERLINK section of the AS help system under „Communication, POWERLINK, General information, Hardware - IF/LS“.

CPU modules

X20CP3584, X20CP1584, X20CP3583, X20CP1583



Short description	X20CP3584	X20CP1584	X20CP3583	X20CP1583
Interfaces		1x RS232, 1x Ethernet, 1x POWERLINK (V1/V2), 2x USB, 1x X2X Link		
System module		CPU		
General information	X20CP3584	X20CP1584	X20CP3583	X20CP1583
Cooling			Fanless	
CPU redundancy possible	Yes	No	No	No
Power consumption without interface module and USB	8.6 W	8.6 W	8.2 W	8.2 W
Internal power consumption of the X2X Link and I/O supply ¹⁾				
Bus			1.42 W	
Internal I/O			0.6 W	
Certification				
CE			Yes	
cULus			Yes	
ATEX Zone 2 ²⁾			Yes	
KC	Yes	Yes	-	-
GL			Yes	
LR	-	Yes	-	Yes
GOST-R			Yes	
CPU and X2X Link supply	X20CP3584	X20CP1584	X20CP3583	X20CP1583
Input voltage			24 VDC -15% / +20%	
Input current			Max. 1.5 A	
Fuse			Integrated, cannot be replaced	
Reverse polarity protection			Yes	
X2X Link supply output	X20CP3584	X20CP1584	X20CP3583	X20CP1583
Nominal output power			7 W ³⁾	
Parallel operation			Yes ⁴⁾	
Redundant operation			Yes	
Input I/O supply	X20CP3584	X20CP1584	X20CP3583	X20CP1583
Input voltage			24 VDC -15% / +20%	
Fuse			Required line fuse: Max. 10 A, slow-blow	
Output I/O supply	X20CP3584	X20CP1584	X20CP3583	X20CP1583
Rated output voltage			24 VDC	
Permitted contact load			10 A	
Supply - General information	X20CP3584	X20CP1584	X20CP3583	X20CP1583
Electrical isolation				
I/O feed - I/O supply			No	
CPU/X2X Link feed - CPU/X2X Link supply			Yes	

Note: Product photos are not shown to scale.

X20CP3584, X20CP1584, X20CP3583, X20CP1583

Controller	X20CP3584	X20CP1584	X20CP3583	X20CP1583
CompactFlash slot			1	
Real-time clock		Nonvolatile, 1 s resolution, -10 to 10 ppm accuracy at 25°C		
Processor				
Type			ATOM™ E620T	
Clock frequency	0.6 GHz	0.6 GHz	333 MHz	333 MHz
L1 cache				
Data code			24 kB	
Program code			32 kB	
Modular interface slots	3	1	3	1
Remanent variables	Max. 256 kB ⁵⁾	Max. 256 kB ⁵⁾	Max. 64 kB ⁵⁾	Max. 64 kB ⁵⁾
Shortest task class cycle time	400 µs	400 µs	800 µs	800 µs
Typical instruction cycle time	0.0075 µs	0.0075 µs	0.01 µs	0.01 µs
Data buffering				
Battery monitoring			Yes	
Lithium battery		Min. 2 years at 23°C ambient temperature		
Standard memory				
RAM	256 MB DDR2 SDRAM	256 MB DDR2 SDRAM	128 MB DDR2 SDRAM	128 MB DDR2 SDRAM
User RAM			1 MB SRAM ⁶⁾	
Interfaces	X20CP3584	X20CP1584	X20CP3583	X20CP1583
IF1 interface				
Signal			RS232	
Design		Connection made using 12-pin X20TB12 terminal block		
Max. distance			900 m	
Transfer rate			Max. 115.2 kbit/s	
IF2 interface				
Signal			Ethernet	
Design			1x RJ45 shielded	
Cable length		Max. 100 m between 2 stations (segment length)		
Transfer rate			10/100/1000 Mbit/s	
Transmission				
Physical layer		10BASE-T/100BASE-TX/1000BASE-T		
Half-duplex			Yes	
Full-duplex			Yes	
Autonegotiation			Yes	
Auto-MDI / MDIX			Yes	
IF3 interface				
Fieldbus		POWERLINK (V1/V2) managing or controlled node		
Type			Type 4 ⁷⁾	
Design			1x RJ45 shielded	
Cable length		Max. 100 m between 2 stations (segment length)		
Transfer rate			100 Mbit/s	
Transmission				
Physical layer			100BASE-TX	
Half-duplex			Yes	
Full-duplex			POWERLINK mode: No / Ethernet mode: Yes	
Autonegotiation			Yes	
Auto-MDI / MDIX			Yes	
IF4 interface				
Type			USB 1.1/2.0	
Design			Type A	
IF5 interface				
Type			USB 1.1/2.0	
Design			Type A	

CPU modules

X20CP3584, X20CP1584, X20CP3583, X20CP1583

IF6 interface

Fieldbus

X2X Link master

Environmental conditions	X20CP3584	X20CP1584	X20CP3583	X20CP1583
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Temperature

Operation

Horizontal installation

-25 to 60°C

Vertical installation

-25 to 50°C

Mechanical characteristics	X20CP3584	X20CP1584	X20CP3583	X20CP1583
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Note

Order application memory (CompactFlash) separately
 Backup battery included in delivery
 X20 locking plate (right) included in delivery
 X20 terminal block (12-pin) included in delivery
 Interface module slot covers included in delivery

Dimensions

Width	200 mm	150 mm	200 mm	150 mm
Height			99 mm	
Depth			85 mm	

¹⁾ The specified values are maximum values. The exact calculation is included as a data sheet in the module documentation and can be downloaded from the B&R website.

²⁾ Ta min.: 0°C

Ta max.: See environmental conditions

³⁾ When operated at temperatures above 55°C, a derating of the nominal output power to 5 W for the X2X Link supply must be taken into consideration.

⁴⁾ In parallel operation, only 75% of the rated power can be assumed. It is important to make sure that all power supplies operated in parallel are switched on and off at the same time.

⁵⁾ Can be configured in Automation Studio.

⁶⁾ 1 MB SRAM minus the configured remanent variables.

⁷⁾ See the POWERLINK section of the AS help system under „Communication, POWERLINK, General information, Hardware - IF/LS“.

X20CP1483-1, X20CP1483



Short description	X20CP1483-1	X20CP1483
Interfaces		1x RS232, 1x Ethernet, 1x POWERLINK (V1/V2), 2x USB, 1x X2X Link
System module		CPU
General information	X20CP1483-1	X20CP1483
Cooling		Fanless
Power consumption without memory card, interface module and USB		6 W
Internal power consumption of the X2X Link and I/O supply ¹⁾		
Bus		1.42 W
Internal I/O		0.6 W
Certification		
CE		Yes
cULus		Yes
cCSAus HazLoc Class 1 Division 2	-	Yes
ATEX Zone 2 ²⁾		Yes
KC		Yes
GL		Yes
GOST-R		Yes
CPU and X2X Link supply	X20CP1483-1	X20CP1483
Input voltage		24 VDC -15% / +20%
Input current		Max. 2.2 A
Fuse		Integrated, cannot be replaced
Reverse polarity protection		Yes
X2X Link supply output	X20CP1483-1	X20CP1483
Nominal output power		7 W ³⁾
Parallel operation		Yes ⁴⁾
Redundant operation		Yes
Input I/O supply	X20CP1483-1	X20CP1483
Input voltage		24 VDC -15% / +20%
Fuse		Required line fuse: Max. 10 A, slow-blow
Output I/O supply	X20CP1483-1	X20CP1483
Nominal output voltage		24 VDC
Permitted contact load		10 A
Supply - General information	X20CP1483-1	X20CP1483
Electrical isolation		
I/O feed - I/O supply		No
CPU/X2X Link feed - CPU/X2X Link supply		Yes

CPU modules

X20CP1483-1, X20CP1483

Controller	X20CP1483-1	X20CP1483
CompactFlash slot		1
Real-time clock		Nonvolatile, 1 s resolution, -10 to 10 ppm accuracy at 25°C
Processor		
Type		x86 100 comp.
Clock frequency		100 MHz
Modular interface slots		1
Remanent variables		Max. 32 kB ⁵⁾
Shortest task class cycle time		1 ms
Typical instruction cycle time		0.09 µs
Data buffering		
Battery monitoring		Yes
Lithium battery		At least 3 years
Standard memory		
RAM	64 MB SDRAM	32 MB SDRAM
User RAM		128 kB SRAM ⁶⁾
Interfaces	X20CP1483-1	X20CP1483
IF1 interface		
Signal		RS232
Design		Connection made using 12-pin X20TB12 terminal block
Max. distance		900 m
Transfer rate		Max. 115.2 kbit/s
IF2 interface		
Signal		Ethernet
Design		1x RJ45 shielded
Cable length		Max. 100 m between 2 stations (segment length)
Transfer rate		10/100 Mbit/s
Transmission		
Physical layer		10BASE-T/100BASE-TX
Half-duplex		Yes
Full-duplex		Yes
Autonegotiation		Yes
Auto-MDI / MDIX		Yes
IF3 interface		
Fieldbus		POWERLINK (V1/V2) managing or controlled node
Type		Type 4 ⁷⁾
Design		1x RJ45 shielded
Cable length		Max. 100 m between 2 stations (segment length)
Transfer rate		100 Mbit/s
Transmission		
Physical layer		100BASE-TX
Half-duplex		Yes
Full-duplex		POWERLINK mode: No / Ethernet mode: Yes
Autonegotiation		Yes
Auto-MDI / MDIX		Yes
IF4 interface		
Type		USB 1.1
Design		Type A
IF5 interface		
Type		USB 1.1
Design		Type A
IF6 interface		
Fieldbus		X2X Link master

X20CP1483-1, X20CP1483

Environmental conditions	X20CP1483-1	X20CP1483
Temperature		
Operation		
Horizontal installation		-25 to 60°C
Vertical installation		-25 to 50°C
Mechanical characteristics	X20CP1483-1	X20CP1483
Note		Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in delivery
Dimensions		
Width		150 mm
Height		99 mm
Depth		85 mm

¹⁾ The specified values are maximum values. The exact calculation is included as a data sheet in the module documentation and can be downloaded from the B&R website.

²⁾ Ta min.: 0°C

Ta max.: See environmental conditions

³⁾ When operated at temperatures above 55°C, a derating of the nominal output power to 5 W for the X2X Link supply must be taken into consideration.

⁴⁾ In parallel operation, only 75% of the nominal power can be assumed. It is important to make sure that all power supplies operated in parallel are switched on and off at the same time.

⁵⁾ Can be configured in Automation Studio.

⁶⁾ Minus configured remanent variables.

⁷⁾ See the POWERLINK section of the AS help system under „Communication, POWERLINK, General information, Hardware - IF/LS“.

CPU modules

X20CP1382, X20CP1381, X20CP1301



Short description	X20CP1382	X20CP1381	X20CP1301
Interfaces	1x RS232, 1x Ethernet, 1x POWERLINK, 2x USB, 1x X2X Link, 1x CAN bus	1x RS232, 1x Ethernet, 1x POWERLINK, 2x USB, 1x X2X Link, 1x CAN bus	1x RS232, 1x Ethernet, 1x USB, 1x X2X Link
System module		CPU	
General information	X20CP1382	X20CP1381	X20CP1301
Cooling		Fanless	
CPU redundancy possible		No	
reACTION-capable I/O channels		No	
Power consumption without interface module and USB	5.5 W	4.8 W	4.3 W
Internal power consumption of the X2X Link and I/O supply ¹⁾			
Bus		0.8 W	
Internal I/O		0.8 W	
Certification			
CE		Yes	
cULus		Yes	
ATEX Zone 2 ²⁾		Yes	
GOST-R		Yes	
CPU and X2X Link supply	X20CP1382	X20CP1381	X20CP1301
Input voltage		24 VDC -15% / +20%	
Input current		Max. 1 A	
Fuse		Integrated, cannot be replaced	
Reverse polarity protection		Yes	
X2X Link supply output	X20CP1382	X20CP1381	X20CP1301
Nominal output power		2 W	
Parallel operation		Yes ³⁾	
Redundant operation		Yes ⁴⁾	
Input I/O supply	X20CP1382	X20CP1381	X20CP1301
Input voltage		24 VDC -15% / +20%	
Fuse		Required line fuse: Max. 10 A, slow-blow	
Output I/O supply	X20CP1382	X20CP1381	X20CP1301
Nominal output voltage		24 VDC	
Permitted contact load		10 A	
Controller	X20CP1382	X20CP1381	X20CP1301
Real-time clock		Buffering for at least 300 hours at 25°C, 1 s resolution, -18 to 28 ppm accuracy at 25°C	
Processor			
Type			Vx86EX
Clock frequency	400 MHz	200 MHz	200 MHz
L1 cache			
Data code			16 kB
Program code			16 kB

X20CP1382, X20CP1381, X20CP1301

Modular interface slots		1	
Remanent variables	32 kB FRAM, buffering >10 years ⁵⁾	16 kB FRAM, buffering >10 years ⁵⁾	16 kB FRAM, buffering >10 years ⁵⁾
Shortest task class cycle time	1 ms	2 ms	2 ms
Typical instruction cycle time	0.0199 µs	0.0419 µs	0.0419 µs
Standard memory			
RAM	256 MB DDR3 SDRAM	128 MB DDR3 SDRAM	128 MB DDR3 SDRAM
Program memory			
Type	2 GB eMMC flash memory	1 GB eMMC flash memory	1 GB eMMC flash memory
Data retention		10 years	
Guaranteed clear/write cycles		20,000	
Interfaces	X20CP1382	X20CP1381	X20CP1301
IF1 interface			
Signal		RS232	
Design		Connection made using 16-pin X20TB1F terminal block	
Max. distance		900 m	
Transfer rate		Max. 115.2 kbit/s	
IF2 interface			
Signal		Ethernet	
Design		1x RJ45 shielded	
Cable length		Max. 100 m between 2 stations (segment length)	
Transfer rate		10/100 Mbit/s	
Transmission			
Physical layer		10BASE-T / 100BASE-TX	
Half-duplex		Yes	
Full-duplex		Yes	
Autonegotiation		Yes	
Auto-MDI / MDIX		Yes	
IF3 interface			
Fieldbus	POWERLINK managing or controlled node	POWERLINK managing or controlled node	-
Type	Type 4 ⁶⁾	Type 4 ⁶⁾	-
Design	1x RJ45 shielded	1x RJ45 shielded	-
Cable length	Max. 100 m between 2 stations (segment length)	Max. 100 m between 2 stations (segment length)	-
Transfer rate	100 Mbit/s	100 Mbit/s	-
Transmission			
Physical layer	100BASE-TX	100BASE-TX	-
Half-duplex	Yes	Yes	-
Full-duplex	No	No	-
Autonegotiation	Yes	Yes	-
Auto-MDI / MDIX	Yes	Yes	-
IF4 interface			
Type		USB 1.1/2.0	
Design		Type A	
Max. output current		0.5 A	
IF5 interface			
Type	USB 1.1/2.0	USB 1.1/2.0	-
Design	Type A	Type A	-
Max. output current	0.1 A	0.1 A	-
IF6 interface			
Fieldbus		X2X Link master	
IF7 interface			
Signal	CAN bus	CAN bus	-
Design	Connection made using 16-pin X20TB1F terminal block	Connection made using 16-pin X20TB1F terminal block	-
Max. distance	1000 m	1000 m	-
Transfer rate	Max. 1 Mbit/s	Max. 1 Mbit/s	-

CPU modules

X20CP1382, X20CP1381, X20CP1301

Digital inputs	X20CP1382	X20CP1381	X20CP1301
Quantity	14 standard inputs, 4 high-speed inputs and 4 mixed channels, configurable as inputs or outputs using software		
Nominal voltage	24 VDC		
Input filter			
Hardware	Standard inputs and mixed channels: $\leq 200 \mu\text{s}$ High-speed inputs: $\leq 2 \mu\text{s}$, when used as standard inputs: $\leq 200 \mu\text{s}$		
Software	Default 1 ms, configurable between 0 and 25 ms in 0.1 ms intervals		
Connection type	1-wire connections		
Input circuit	Sink		
Additional functions	X2 - High-speed digital inputs: 2x 250 kHz event counting, 2x AB counters, ABR incremental encoder, direction/frequency, period measurement, gate measurement, differential time measurement, edge counters, edge times		
AB incremental encoder	X20CP1382	X20CP1381	X20CP1301
Quantity	2		
Encoder inputs	24 V, asymmetrical		
Counter size	32-bit		
Input frequency	Max. 100 kHz		
Evaluation	4x		
Encoder supply	Module-internal, max. 300 mA		
ABR incremental encoder	X20CP1382	X20CP1381	X20CP1301
Quantity	1		
Encoder inputs	24 V, asymmetrical		
Counter size	32-bit		
Input frequency	Max. 100 kHz		
Evaluation	4x		
Encoder supply	Module-internal, max. 300 mA		
Event counter	X20CP1382	X20CP1381	X20CP1301
Quantity	2		
Signal form	Square wave pulse		
Evaluation	1x		
Input frequency	Max. 250 kHz		
Counter size	32-bit		
Edge detection / Time measurement	X20CP1382	X20CP1381	X20CP1301
Possible measurements	Period measurement, gate measurement, differential time measurement, edge counter, edge times		
Measurements per module	Each function up to 2x		
Counter size	32-bit		
Timestamp	1 μs resolution		
Signal form	Square wave pulse		
Analog inputs	X20CP1382	X20CP1381	X20CP1301
Quantity	2 ⁷⁾		
Input	$\pm 10 \text{ V}$ or 0 to 20 mA / 4 to 20 mA, via different terminal connections		
Input type	Differential input		
Digital converter resolution			
Voltage	± 12 -bit		
Current	12-bit		
Conversion time	1 channel enabled: 100 μs 2 channels enabled: 200 μs		
Output format			
Data type	INT		
Input impedance in signal range			
Voltage	20 M Ω		
Current	-		
Load			
Voltage	-		
Current	<300 Ω		

X20CP1382, X20CP1381, X20CP1301

Input protection	Protection against wiring with supply voltage		
Max. error at 25°C			
Voltage			
Gain	0.18% (Rev. <C0: 0.37%) ⁸⁾		
Offset	0.04% (Rev. <C0: 0.25%) ⁹⁾		
Current			
Gain	0 to 20 mA = 0.15% (Rev. <C0: 0.52%) / 4 to 20 mA = 0.25% ⁸⁾		
Offset	0 to 20 mA = 0.1% (Rev. <C0: 0.4%) / 4 to 20 mA = 0.15% ¹⁰⁾		
Temperature inputs resistance measurement	X20CP1382	X20CP1381	X20CP1301
Quantity	1		
Input	Resistance measurement with constant current supply for 2-wire connections		
Digital converter resolution	13-bit		
Conversion time	Only temperature input enabled: 200 µs Temperature and analog input enabled: 400 µs		
Output format	INT or UINT for resistance measurement		
Sensor			
PT1000	-200 to 850°C		
Resistance measurement range	0.1 to 4000 Ω		
Max. error at 25°C			
Gain	0.3% (Rev. <C0: 1.93%) ¹¹⁾		
Offset	0.15% (Rev. <C0: 0.32%) ¹²⁾		
Digital outputs	X20CP1382	X20CP1381	X20CP1301
Design	Standard outputs and mixed channels: FET positive switching High-speed outputs: Push-Pull		
Quantity	4 standard outputs, 4 high-speed outputs and 4 mixed channels, configurable as inputs or outputs using software		
Nominal voltage	24 VDC		
Nominal output current	Standard outputs and mixed channels: 0.5 A High-speed outputs: 0.2 A		
Total nominal current	Standard outputs and mixed channels: 4 A High-speed outputs: 0.8 A		
Connection type	1-wire connections		
Output circuit	Standard outputs and mixed channels: Source High-speed outputs: Sink or source		
Output protection ¹³⁾	Thermal cutoff if overcurrent or short circuit occurs (see value "Peak short circuit current") Internal inverse diode for switching inductive loads (see section "Switching inductive loads")		
Pulse width modulation ¹⁴⁾			
Period duration	5 to 65535 µs corresponds to 200 kHz to 15 Hz		
Pulse duration	0.0 to 100.0%, minimum 2.5 µs		
Resolution for pulse duration	0.1% of the configured frequency		
Environmental conditions	X20CP1382	X20CP1381	X20CP1301
Temperature			
Operation			
Horizontal installation	-25 to 60°C (Rev. <D0: -25 to 55°C)	-25 to 60°C	-25 to 60°C
Vertical installation		-25 to 50°C	
Mechanical characteristics	X20CP1382	X20CP1381	X20CP1301
Note	X20 locking plate (right) included in delivery 3 X20 terminal blocks (16-pin) included in delivery Interface module slot cover included in delivery		
Dimensions			
Width	164 mm		
Height	99 mm		
Depth	75 mm		

X20CP1382, X20CP1381, X20CP1301

- ¹⁾ The specified values are maximum values. The exact calculation is available with the other module documentation for download from the B&R website.
- ²⁾ Ta min.: 0°C
Ta max.: See environmental conditions
- ³⁾ When operated in parallel, the nominal power of 2 W is not permitted to be added to the total power.
- ⁴⁾ Up to 2 W bus load.
- ⁵⁾ Can be set in Automation Studio.
- ⁶⁾ See the POWERLINK section of the AS help system under „Communication, POWERLINK, General information, Hardware - IF/LS“.
- ⁷⁾ To reduce power dissipation, B&R recommends bridging unused inputs on the terminals or configuring them as current signals.
- ⁸⁾ Based on the current measured value.
- ⁹⁾ Based on the 20 V measurement range.
- ¹⁰⁾ Based on the 20 mA measurement range.
- ¹¹⁾ Based on the current resistance value.
- ¹²⁾ Based on the entire resistance measurement range.
- ¹³⁾ For high-speed digital outputs, derating must be applied at switching frequencies >50 kHz (see section "Switching frequency derating for high-speed digital outputs"). Overtemperature protection is not provided.
- ¹⁴⁾ The high-speed digital outputs can be used for pulse width modulation.

Compact CPUs

X20CP0292, X20CP0291, X20CP0201



Short description	X20CP0292	X20CP0291	X20CP0201
Interfaces	1x Ethernet onboard	1x Ethernet onboard	-
System module		CPU	
General information	X20CP0292	X20CP0291	X20CP0201
Power consumption	3 W	2.7 W	2.2 W
Certification			
CE		Yes	
cULus		Yes	
cCSAus HazLoc Class 1 Division 2		Yes	
ATEX Zone 2 ¹⁾		Yes	
KC		Yes	
GL		Yes	
GOST-R		Yes	
Controller	X20CP0292	X20CP0291	X20CP0201
Real-time clock ²⁾		Yes, 1 s resolution, -18 to 28 ppm accuracy at 25°C	
Processor			
Type	Embedded µP 25	Embedded µP 16	Embedded µP 16
Backup battery		No	
Shortest task class cycle time	2 ms	4 ms	4 ms
Typical instruction cycle time	0.5 µs	0.8 µs	0.8 µs
Permanent variables			
Buffer duration		>10 years	
Memory		2.75 kB FRAM ³⁾	
Standard memory			
User PROM	3 MB FlashPROM	1 MB FlashPROM	1 MB FlashPROM
User RAM	750 kB SRAM ⁴⁾	100 kB SRAM ⁴⁾	100 kB SRAM ⁴⁾
Interfaces	X20CP0292	X20CP0291	X20CP0201
IF2 interface			
Signal	Ethernet	Ethernet	-
Design	1x RJ45 shielded	1x RJ45 shielded	-
Cable length	Max. 100 m between 2 stations (segment length)	Max. 100 m between 2 stations (segment length)	-
Transfer rate	100 Mbit/s	100 Mbit/s	-
Transmission			
Physical layer	100BASE-TX	100BASE-TX	-
Half-duplex	Yes	Yes	-
Full-duplex	No	No	-
Autonegotiation	No	No	-
Auto-MDI / MDIX	Yes	Yes	-
On base module			
X20BB22 ⁵⁾		Compact CPU base module with integrated RS232 interface	
X20BB27 ⁶⁾		Compact CPU base module with integrated RS232 and CAN interfaces	

Compact CPUs

X20CP0292, X20CP0291, X20CP0201

Environmental conditions	X20CP0292	X20CP0291	X20CP0201
Temperature			
Operation			
Horizontal installation		-25 to 60°C	
Vertical installation		-25 to 50°C	
Mechanical characteristics	X20CP0292	X20CP0291	X20CP0201
Note		Order 1x X20TB12 terminal block separately Order 1x X20PS9500 or X20PS9502 power supply module separately Order 1x X20BB22 or X20BB27 compact CPU base separately	

¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

²⁾ The real-time clock is buffered for approx. 1000 hours by a gold foil capacitor. The gold foil capacitor is completely charged after 18 continuous hours of operation.

³⁾ This FRAM stores its contents ferroelectrically. Therefore, no backup battery is needed.

⁴⁾ Not buffered.

⁵⁾ For technical data, see the data sheet for the X20PS9500 power supply module.

⁶⁾ For technical data, see the data sheet for the X20PS9502 power supply module.

System modules for compact CPUs

X20BB22, X20BB27



Short description	X20BB22	X20BB27
Bus module	X20 compact CPU base - backplane for compact CPU and compact CPU supply module	
Interfaces	1x RS232 connection	1x RS232 connection, 1x CAN bus connection
General information	X20BB22	X20BB27
Power consumption		
Bus	0.32 W	0.53 W
Internal I/O		-
Certification		
CE		Yes
cULus		Yes
cCSAus HazLoc Class 1 Division 2		Yes
ATEX Zone 2 ¹⁾		Yes
KC		Yes
GL		Yes
LR		Yes
GOST-R		Yes
I/O supply	X20BB22	X20BB27
Nominal voltage		24 VDC
Permitted contact load		10 A
Environmental conditions	X20BB22	X20BB27
Temperature		
Operation		
Horizontal installation		-25 to 60°C
Vertical installation		-25 to 50°C
Mechanical characteristics	X20BB22	X20BB27
Note	Left and right X20 locking plates included in delivery	
¹⁾ Ta min.: 0°C Ta max.: See environmental conditions		

System modules for compact CPUs

X20PS9500, X20PS9502



Short description	X20PS9500	X20PS9502
Power supply module	24 VDC supply module for compact or fieldbus CPU, X2X Link supply and I/O	
Interfaces	1x RS232, 1x CAN bus ¹⁾	1x RS232, 1x CAN bus ²⁾
General information	X20PS9500	X20PS9502
Power consumption ³⁾		
Bus	1.42 W	1.44 W
Internal I/O		0.6 W
Electrical isolation		
CPU/X2X Link feed - CPU/X2X Link supply	Yes	No
I/O feed - I/O supply		No
Certification		
CE		Yes
cULus		Yes
cCSAus HazLoc Class 1 Division 2		Yes
ATEX Zone 2 ⁴⁾		Yes
KC		Yes
GL	Yes	-
LR	Yes	-
GOST-R		Yes
CPU / X2X Link supply input	X20PS9500	X20PS9502
Input voltage		24 VDC -15% / +20%
Input current		Max. 0.7 A
Fuse		Integrated, cannot be replaced
Reverse polarity protection		Yes
CPU / X2X Link supply output	X20PS9500	X20PS9502
Nominal output power	7 W	-
Nominal output power		
Horizontal installation	-	7 W at 45°C and 5 W at 55°C
Vertical installation	-	7 W at 40°C and 5 W at 50°C
Parallel operation	Yes ⁵⁾	No
Redundant operation	Yes	No
Input I/O supply	X20PS9500	X20PS9502
Input voltage		24 VDC -15% / +20%
Fuse		Required line fuse: Max. 10 A, slow-blow
Output I/O supply	X20PS9500	X20PS9502
Nominal output voltage		24 VDC
Permitted contact load		10 A
Interfaces	X20PS9500	X20PS9502
IF1 interface		
Signal		RS232
Design		Connection made using 12-pin X20TB12 terminal block
Transfer rate		Max. 115.2 kbit/s
IF3 interface ¹⁾		
Signal		CAN bus
Design		Connection made using 12-pin X20TB12 terminal block
Transfer rate		Max. 1 Mbit/s
Environmental conditions	X20PS9500	X20PS9502
Temperature		
Operation		
Horizontal installation		-25 to 60°C
Vertical installation		-25 to 50°C

X20PS9500, X20PS9502

Mechanical characteristics	X20PS9500	X20PS9502
Note	Order 1x X20TB12 terminal block separately Order 1x X20BB22 or X20BB27 compact CPU base separately Order 1x X20BB3x/4x fieldbus CPU base separately	Order 1x X20TB12 terminal block separately Order 1x X20BB22 or X20BB27 compact CPU base separately Order 1x X20BB32 or X20BB37 fieldbus CPU base separately
¹⁾ CAN bus only when used with the X20BB27, X20BB37 or X20BB47 bus module.		
²⁾ CAN bus only when used with the X20BB27 or X20BB37 bus module.		
³⁾ The specified values are maximum values. The calculation is also available for download as a data sheet with the other module documentation on the B&R website.		
⁴⁾ Ta min.: 0°C Ta max.: See environmental conditions		
⁵⁾ In parallel operation, only 75% of the nominal power can be assumed. It is important to make sure that all power supplies operated in parallel are switched on and off at the same time.		

Fieldbus CPUs

X20XC0292, X20XC0202, X20XC0201



Short description	X20XC0292	X20XC0202	X20XC0201
Interfaces	1x Ethernet onboard	-	-
System module		CPU	
General information	X20XC0292	X20XC0202	X20XC0201
Power consumption	2.8 W	2.2 W	2 W
Certification			
CE		Yes	
cULus		Yes	
cCSAus HazLoc Class 1 Division 2		Yes	
ATEX Zone 2 ¹⁾		Yes	
KC		Yes	
GL		Yes	
GOST-R		Yes	
Controller	X20XC0292	X20XC0202	X20XC0201
Real-time clock ²⁾		Yes, 1 s resolution, -18 to 28 ppm accuracy at 25°C	
Processor			
Type	Embedded µP 25	Embedded µP 25	Embedded µP 16
Backup battery		No	
Shortest task class cycle time	2 ms	2 ms	4 ms
Typical instruction cycle time	0.5 µs	0.5 µs	0.8 µs
Permanent variables			
Buffer duration		>10 years	
Memory		2.75 kB FRAM ³⁾	
Standard memory			
User PROM	3 MB FlashPROM	3 MB FlashPROM	1 MB FlashPROM
User RAM	750 kB SRAM ⁴⁾	750 kB SRAM ⁴⁾	100 kB SRAM ⁴⁾
Slots for fieldbus modules			
X20BB3x		1	
X20BB4x		2	
Interfaces	X20XC0292	X20XC0202	X20XC0201
IF2 interface			
Signal	Ethernet	-	-
Design	1x RJ45 shielded	-	-
Cable length	Max. 100 m between 2 stations (segment length)	-	-
Transfer rate	100 Mbit/s	-	-
Transmission			
Physical layer	100BASE-TX	-	-
Half-duplex	Yes	-	-
Full-duplex	No	-	-
Autonegotiation	No	-	-
Auto-MDI / MDIX	Yes	-	-

X20XC0292, X20XC0202, X20XC0201

On base module

X20BB32 and X20BB42 ⁵⁾

X20BB37 and X20BB47 ⁶⁾

Fieldbus CPU base module with integrated RS232 interface

Fieldbus CPU base module with integrated RS232 and CAN interfaces

Environmental conditions	X20XC0292	X20XC0202	X20XC0201
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Temperature

Operation

Horizontal installation

-25 to 60°C

Vertical installation

-25 to 50°C

Mechanical characteristics	X20XC0292	X20XC0202	X20XC0201
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Note		Order 1x X20TB12 terminal block separately Order 1x X20PS9500 or X20PS9502 power supply module separately Order 1x X20BB3x/4x fieldbus CPU base separately	
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¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

²⁾ The real-time clock is buffered for approx. 1000 hours by a gold foil capacitor. The gold foil capacitor is completely charged after 18 continuous hours of operation.

³⁾ This FRAM stores its contents ferroelectrically. Therefore, no backup battery is needed.

⁴⁾ Not buffered.

⁵⁾ For technical data, see the data sheet for the X20PS9500 power supply module.

⁶⁾ For technical data, see the data sheet for the X20PS9502 power supply module.

System modules for fieldbus CPUs

X20BB32, X20BB37, X20BB42, X20BB47



Short description	X20BB32	X20BB37	X20BB42	X20BB47
Bus module	X20 fieldbus CPU base, backplane for fieldbus CPU, fieldbus CPU supply module and interface module	X20 fieldbus CPU base, backplane for fieldbus CPU, fieldbus CPU supply module and interface module	X20 fieldbus CPU base, backplane for fieldbus CPU, fieldbus CPU supply module and two interface modules	X20 fieldbus CPU base, backplane for fieldbus CPU, fieldbus CPU supply module and two interface modules
Interfaces	1x RS232 connection	1x RS232 connection, 1x CAN bus connection	1x RS232 connection	1x RS232 connection, 1x CAN bus connection
General information	X20BB32	X20BB37	X20BB42	X20BB47
Power consumption				
Bus	0.35 W	0.56 W	0.35 W	0.56 W
Internal I/O			-	
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2			Yes	
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL	-	-	Yes	Yes
LR	-	-	Yes	Yes
GOST-R			Yes	
I/O supply	X20BB32	X20BB37	X20BB42	X20BB47
Nominal voltage			24 VDC	
Permitted contact load			10 A	
Environmental conditions	X20BB32	X20BB37	X20BB42	X20BB47
Temperature				
Operation				
Horizontal installation	0 to 55°C	0 to 55°C	-25 to 60°C	-25 to 60°C
Vertical installation	0 to 50°C	0 to 50°C	-25 to 50°C	-25 to 50°C
Mechanical characteristics	X20BB32	X20BB37	X20BB42	X20BB47

Note Left and right X20 locking plates included in delivery

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20IF1074



Short description

Communication module	1x CAN bus
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General information

Power consumption	0.69 W
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Certification

CE	Yes
cULus	Yes
cCSAus HazLoc Class 1 Division 2	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	Yes
LR	Yes
GOST-R	Yes

Interfaces

IF1 interface

Signal	CAN bus
Design	5-pin male multipoint connector
Max. distance	1000 m
Transfer rate	Max. 1 Mbit/s

Environmental conditions

Temperature

Operation

Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Note	Order 1x TB2105 terminal block separately
Slot	In X20 fieldbus CPU

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Bus controllers

X20BC0043, X20BC0043-10, X20BC0143-10



Short description	X20BC0043	X20BC0043-10	X20BC0143-10
Bus controller		CANopen slave	
General information	X20BC0043	X20BC0043-10	X20BC0143-10
Power consumption			
Bus	1.5 W	2 W	2 W
Certification			
CE		Yes	
cULus		Yes	
cCSAus HazLoc Class 1 Division 2		Yes	
ATEX Zone 2 ¹⁾		Yes	
KC	Yes	-	-
GL		Yes	
LR		Yes	
GOST-R		Yes	
Interfaces	X20BC0043	X20BC0043-10	X20BC0143-10
Fieldbus		CANopen slave	
Design	5-pin male multipoint connector	5-pin male multipoint connector	9-pin male DSUB connector
Max. distance		1000 m	
Transfer rate		Max. 1 Mbit/s	
Default transfer rate		Automatic transfer rate detection or fixed rate setting	
Terminating resistor	Integrated in the module	Integrated in the module	-
Environmental conditions	X20BC0043	X20BC0043-10	X20BC0143-10
Temperature			
Operation			
Horizontal installation	0 to 55°C	-25 to 60°C	-25 to 60°C
Vertical installation	0 to 50°C	-25 to 50°C	-25 to 50°C
Mechanical characteristics	X20BC0043	X20BC0043-10	X20BC0143-10
Note	Order 1x TB2105 terminal block separately Order 1x X20TB12 terminal block separately Order 1x X20PS9400 or X20PS9402 power supply module separately Order 1x X20BB80 bus base separately	Order 1x TB2105 terminal block separately Order 1x X20TB12 terminal block separately Order 1x X20PS9400 or X20PS9402 power supply module separately Order 1x X20BB80 bus base separately	Order 1x X20TB12 terminal block separately Order 1x X20PS9400 or X20PS9402 power supply module separately Order 1x X20BB80 bus base separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ The minimum cycle time defines how far the bus cycle can be reduced without communication errors occurring.

X20BC0053, X20BC0063, X20BC0073



Short description	X20BC0053	X20BC0063	X20BC0073
Bus controller	DeviceNet adapter (slave)	PROFIBUS DP V0 slave	CAN I/O slave
General information	X20BC0053	X20BC0063	X20BC0073
Power consumption			
Bus	1.5 W	2.3 W	1.5 W
Certification			
CE		Yes	
cULus		Yes	
cCSAus HazLoc Class 1 Division 2		Yes	
ATEX Zone 2 ¹⁾		Yes	
KC		Yes	
GL	Yes	-	-
LR	Yes	-	-
GOST-R		Yes	
Interfaces	X20BC0053	X20BC0063	X20BC0073
Fieldbus	DeviceNet adapter (slave)	PROFIBUS DP V0 slave	CAN I/O slave
Design	5-pin male multipoint connector	9-pin female DSUB connector	5-pin male multipoint connector
Max. distance	500 m	1200 m	1000 m
Transfer rate	Max. 500 kbit/s	Max. 12 Mbit/s	Max. 1 Mbit/s
Default transfer rate	Automatic transfer rate detection	Automatic transfer rate detection	Automatic transfer rate detection or fixed rate setting
Terminating resistor	Integrated in the module	-	Integrated in the module
Environmental conditions	X20BC0053	X20BC0063	X20BC0073
Temperature			
Operation			
Horizontal installation	0 to 55°C	-25 to 60°C	-25 to 60°C
Vertical installation	0 to 50°C	-25 to 50°C	-25 to 50°C
Mechanical characteristics	X20BC0053	X20BC0063	X20BC0073
Note	Order 1x TB2105 terminal block separately Order 1x X20TB12 terminal block separately Order 1x X20PS9400 or X20PS9402 power supply module separately Order 1x X20BB80 bus base separately	Order 1x X20TB12 terminal block separately Order 1x X20PS9400 or X20PS9402 power supply module separately Order 1x X20BB80 bus base separately	Order 1x TB2105 terminal block separately Order 1x X20TB12 terminal block separately Order 1x X20PS9400 or X20PS9402 power supply module separately Order 1x X20BB80 bus base separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ The minimum cycle time defines how far the bus cycle can be reduced without communication errors occurring.

Bus controllers

X20BC0083, X20BC0087, X20BC0088, X20BC00E3, X20BC00G3



Short description	X20BC0083	X20BC0087	X20BC0088	X20BC00E3	X20BC00G3
Bus controller	POWERLINK (V1/V2) controlled node	Modbus TCP/UDP slave	EtherNet/IP adapter (slave)	PROFINET RT slave	EtherCAT slave
General information	X20BC0083	X20BC0087	X20BC0088	X20BC00E3	X20BC00G3
Power consumption					
Bus	2 W	2 W	2 W	2.5 W	1.68 W
Certification					
CE			Yes		
cULus			Yes		
cCSAus HazLoc Class 1 Division 2	Yes	Yes	Yes	-	Yes
ATEX Zone 2 ¹⁾				Yes	
KC	Yes	Yes	Yes	-	Yes
GL	Yes	Yes	-	-	-
LR	Yes	Yes	-	-	-
GOST-R				Yes	
Interfaces	X20BC0083	X20BC0087	X20BC0088	X20BC00E3	X20BC00G3
Fieldbus	POWERLINK (V1/V2) controlled node	Modbus TCP/UDP slave	EtherNet/IP adapter (slave)	PROFINET RT slave	EtherCAT slave
Design	2x shielded RJ45 (hub)	2x shielded RJ45 (switch)	2x shielded RJ45 (switch)	2x shielded RJ45 (switch)	2x shielded RJ45
Cable length	Max. 100 m between 2 stations (segment length)				
Transfer rate	100 Mbit/s	10/100 Mbit/s	10/100 Mbit/s	100 Mbit/s	100 Mbit/s
Transmission					
Physical layer	100BASE-TX	10BASE-T/100BASE-TX	10BASE-T/100BASE-TX	100BASE-TX	100BASE-TX
Half-duplex			Yes		
Full-duplex	No	Yes	Yes	Yes	Yes
Autonegotiation			Yes		
Auto-MDI / MDIX			Yes		
Environmental conditions	X20BC0083	X20BC0087	X20BC0088	X20BC00E3	X20BC00G3
Temperature					
Operation					
Horizontal installation	-25 to 60°C	-25 to 60°C	-25 to 60°C	-25 to 60°C	0 to 55°C
Vertical installation	-25 to 50°C	-25 to 50°C	-25 to 50°C	-25 to 50°C	0 to 50°C
Mechanical characteristics	X20BC0083	X20BC0087	X20BC0088	X20BC00E3	X20BC00G3
Note	Order 1x X20TB12 terminal block separately Order 1x X20PS9400 or X20PS9402 power supply module separately Order 1x X20BB80 bus base separately				

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ The minimum cycle time defines how far the bus cycle can be reduced without communication errors occurring.

System modules for bus controllers

X20BB80



Short description

Bus module	Bus base - Backplane for bus controller fieldbus interface and bus controller power supply module
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General information

Power consumption	
Bus	0.35 W
Internal I/O	-
Certification	
CE	Yes
cULus	Yes
cCSAus HazLoc Class 1 Division 2	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	Yes
LR	Yes
GOST-R	Yes

I/O supply

Nominal voltage	24 VDC
Permitted contact load	10 A

Environmental conditions

Temperature	
Operation	
Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Note	Left and right X20 locking plates included in delivery
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¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

System modules for bus controllers

X20PS9400, X20PS9402



Short description	X20PS9400	X20PS9402
Power supply module	24 VDC supply module for bus controller, X2X Link supply and I/O	
Interfaces	1x RS232 service interface	-
General information	X20PS9400	X20PS9402
Power consumption ¹⁾		
Bus	1.42 W	1.44 W
Internal I/O		0.6 W
Electrical isolation		
I/O feed - I/O supply		No
BC/X2X Link feed - BC/X2X Link supply	Yes	No
Certification		
CE		Yes
cULus		Yes
cCSAus HazLoc Class 1 Division 2		Yes
ATEX Zone 2 ²⁾		Yes
KC		Yes
GL	Yes	-
LR	Yes	-
GOST-R		Yes
Bus controller / X2X Link supply input	X20PS9400	X20PS9402
Input voltage	24 VDC -15% / +20%	
Input current	Max. 0.7 A	
Fuse	Integrated, cannot be replaced	
Reverse polarity protection	Yes	
Bus controller / X2X Link supply output	X20PS9400	X20PS9402
Nominal output power	7 W	-
Nominal output power		
Horizontal installation	-	7 W at 45°C and 5 W at 55°C
Vertical installation	-	7 W at 40°C and 5 W at 50°C
Parallel operation	Yes ³⁾	No
Redundant operation	Yes	No
Input I/O supply	X20PS9400	X20PS9402
Input voltage	24 VDC -15% / +20%	
Fuse	Required line fuse: Max. 10 A, slow-blow	
Output I/O supply	X20PS9400	X20PS9402
Nominal output voltage	24 VDC	
Permitted contact load	10 A	
Interfaces	X20PS9400	X20PS9402
Service interface		
Signal	RS232	-
Design	Connection made using 12-pin X20TB12 terminal block	-
Max. transfer rate	115.2 kbit/s	-
Environmental conditions	X20PS9400	X20PS9402
Temperature		
Operation		
Horizontal installation		-25 to 60°C
Vertical installation		-25 to 50°C

X20PS9400, X20PS9402

Mechanical characteristics	X20PS9400	X20PS9402
Note		Order 1x X20TB12 terminal block separately Order 1x X20BB8x bus base separately
¹⁾ The specified values are maximum values. The exact calculation is also available for download as a data sheet with the other module documentation on the B&R website.		
²⁾ Ta min.: 0°C Ta max.: See environmental conditions		
³⁾ In parallel operation, only 75% of the nominal power can be assumed. It is important to make sure that all power supplies operated in parallel are switched on and off at the same time.		

Expandable bus controllers

X20BC1083, X20BC8083, X20BC8084



Short description	X20BC1083	X20BC8083	X20BC8084
Bus controller	POWERLINK (V1/V2) controlled node with up to 2 slots for interface modules	POWERLINK (V1/V2) controlled node with up to 2 slots for hub expansion modules	POWERLINK (V1/V2) controlled node with compact link selector
General information	X20BC1083	X20BC8083	X20BC8084
Power consumption			
Bus		2 W	
Certification			
CE		Yes	
cULus		Yes	
cCSAus HazLoc Class 1 Division 2		Yes	
ATEX Zone 2 ¹⁾		Yes	
KC		Yes	
GL		Yes	
LR		Yes	
GOST-R		Yes	
Interfaces	X20BC1083	X20BC8083	X20BC8084
Fieldbus		POWERLINK (V1/V2) controlled node	
Design	2x shielded RJ45 (hub)	2x shielded RJ45 (hub)	2x shielded RJ45
Cable length		Max. 100 m between 2 stations (segment length)	
Transfer rate		100 Mbit/s	
Transmission			
Physical layer		100BASE-TX	
Half-duplex		Yes	
Full-duplex		No	
Autonegotiation		Yes	
Auto-MDI / MDIX		Yes	
Environmental conditions	X20BC1083	X20BC8083	X20BC8084
Temperature			
Operation			
Horizontal installation	0 to 55°C	-25 to 60°C	-25 to 60°C
Vertical installation	0 to 50°C	-25 to 50°C	-25 to 50°C
Mechanical characteristics	X20BC1083	X20BC8083	X20BC8084
Note	Order 1x X20TB12 terminal block separately Order 1x X20PS9400 or X20PS9402 power supply module separately Order 1x X20BB81 or X20BB82 bus base separately	Order 1x X20TB12 terminal block separately Order 1x X20PS9400 or X20PS9402 power supply module separately Order 1x X20BB8x bus base separately	Order 1x X20TB12 terminal block separately Order 1x X20PS9400 or X20PS9402 power supply module separately Order 1x X20BB80 or X20BB82 bus base separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ The minimum cycle time defines how far the bus cycle can be reduced without communication errors occurring.

System modules for expandable bus controllers

X20BB81, X20BB82



Short description	X20BB81	X20BB82
Bus module	Bus base with one expansion slot	Bus base with 2 expansion slots
General information	X20BB81	X20BB82
Power consumption		
Bus		0.35 W
Internal I/O		-
Certification		
CE		Yes
cULus		Yes
cCSAus HazLoc Class 1 Division 2		Yes
ATEX Zone 2 ¹⁾		Yes
KC		Yes
GL	-	Yes
LR	-	Yes
GOST-R		Yes
I/O supply	X20BB81	X20BB82
Nominal voltage		24 VDC
Permitted contact load		10 A
Environmental conditions	X20BB81	X20BB82
Temperature		
Operation		
Horizontal installation		-25 to 60°C
Vertical installation		-25 to 50°C
Mechanical characteristics	X20BB81	X20BB82
Note	Left and right X20 locking plates included in delivery	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

System modules for expandable bus controllers

X20IF1091-1



Short description

Communication module	1x X2X Link master
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General information

Power consumption	1.29 W
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Certification

CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GOST-R	Yes

Interfaces

IF1 interface

Fieldbus	X2X Link master
Design	4-pin male multipoint connector
Distance between 2 stations	Max. 100 m

Environmental conditions

Temperature

Operation

Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Note	Order 1x TB704 terminal block separately
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Slot	In the X20BC1083-1 expandable bus controller
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¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Interface modules

X20IF1020, X20IF1030



Short description	X20IF1020	X20IF1030
Communication module	1x RS232	1x RS485/RS422
General information	X20IF1020	X20IF1030
Power consumption	0.33 W	0.4 W
Certification		
CE		Yes
cULus		Yes
cCSAus HazLoc Class 1 Division 2		Yes
ATEX Zone 2 ¹⁾		Yes
KC		Yes
GL		Yes
LR		Yes
GOST-R		Yes
Interfaces	X20IF1020	X20IF1030
IF1 interface		
Signal	RS232	RS485/RS422
Design	9-pin male DSUB connector	9-pin female DSUB connector
Max. distance	900 m	1200 m
Transfer rate		Max. 115.2 kbit/s
Environmental conditions	X20IF1020	X20IF1030
Temperature		
Operation		
Horizontal installation		-25 to 60°C
Vertical installation		-25 to 50°C
Mechanical characteristics	X20IF1020	X20IF1030
Slot		In X20 CPU

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Interface modules

X20IF1061, X20IF1063, X20IF1065



Short description	X20IF1061	X20IF1063	X20IF1065
Communication module	PROFIBUS DP V0/V1 master	1x PROFIBUS DP V0 slave	1x PROFIBUS DP V0/V1 slave
General information	X20IF1061	X20IF1063	X20IF1065
Power consumption	1.4 W	0.87 W	1.4 W
Certification			
CE		Yes	
cULus		Yes	
cCSAus HazLoc Class 1 Division 2		Yes	
ATEX Zone 2 ¹⁾		Yes	
KC		Yes	
GOST-R		Yes	
Interfaces	X20IF1061	X20IF1063	X20IF1065
IF1 interface			
Fieldbus	PROFIBUS DP V0/V1 master	PROFIBUS DP V0 slave	PROFIBUS DP V0/V1 slave
Design		9-pin female DSUB connector	
Max. distance		1200 m	
Transfer rate		Max. 12 Mbit/s	
Environmental conditions	X20IF1061	X20IF1063	X20IF1065
Temperature			
Operation			
Horizontal installation	-25 to 60°C	-25 to 60°C	0 to 55°C
Vertical installation	-25 to 50°C	-25 to 50°C	0 to 50°C
Mechanical characteristics	X20IF1061	X20IF1063	X20IF1065
Slot		In X20 CPU	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20IF1072, X20IF2772, X20IF1091, X20IF2792



Short description	X20IF1072	X20IF2772	X20IF1091	X20IF2792
Communication module	1x CAN bus	2x CAN bus	1x X2X Link master	1x X2X Link master, 1x CAN bus
General information	X20IF1072	X20IF2772	X20IF1091	X20IF2792
Power consumption	0.79 W	1.2 W	0.97 W	1.51 W
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2			Yes	
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL	Yes	Yes	-	-
LR	Yes	Yes	-	-
GOST-R			Yes	
Interfaces	X20IF1072	X20IF2772	X20IF1091	X20IF2792
IF1 interface				
Fieldbus	-	-	X2X Link master	X2X Link master
Signal	CAN bus ²⁾	CAN bus ²⁾	-	-
Design	5-pin male multipoint connector	5-pin male multipoint connector	4-pin male multipoint connector	4-pin male multipoint connector
Distance between 2 stations	-	-	Max. 100 m	Max. 100 m
Max. distance	1000 m	1000 m	-	-
Transfer rate	Max. 1 Mbit/s	Max. 1 Mbit/s	-	-
IF2 interface				
Signal	-	CAN bus ²⁾	-	CAN bus ²⁾
Design	-	5-pin male multipoint connector	-	5-pin male multipoint connector
Max. distance	-	1000 m	-	1000 m
Transfer rate	-	Max. 1 Mbit/s	-	Max. 1 Mbit/s
Environmental conditions	X20IF1072	X20IF2772	X20IF1091	X20IF2792
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20IF1072	X20IF2772	X20IF1091	X20IF2792
Note	Order 1x TB2105 terminal block separately	Order 2x TB2105 terminal blocks separately	Order 1x TB704 terminal block separately	Order 1x TB704 and 1x TB2105 terminal block separately
Slot			In X20 CPU	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ This CAN bus interface can be configured as a CANopen master in Automation Studio 3.0 and higher.

Interface modules

X20IF1082, X20IF1082-2, X20IF1086-2, X20IF2181-2



Short description	X20IF1082	X20IF1082-2	X20IF1086-2	X20IF2181-2
Communication module	1x POWERLINK (V1/V2) managing or controlled node	1x POWERLINK (V1/V2) managing or controlled node	1x POWERLINK (V1/V2) managing or controlled node	1x POWERLINK managing or controlled node
General information	X20IF1082	X20IF1082-2	X20IF1086-2	X20IF2181-2
POWERLINK cable redundancy system	-	-	-	Configurable
Controller redundancy	-	-	-	Configurable
Power consumption	2 W	2 W	1.8 W (Rev. <D0: 2 W)	2 W
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2	Yes	-	-	-
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL	Yes	Yes	-	Yes
LR	Yes	Yes	-	Yes
GOST-R			Yes	
Interfaces	X20IF1082	X20IF1082-2	X20IF1086-2	X20IF2181-2
Fieldbus	POWERLINK (V1/V2) managing or controlled node	POWERLINK (V1/V2) managing or controlled node	POWERLINK (V1/V2) managing or controlled node	POWERLINK managing or controlled node
Type	Type 3 ²⁾	Type 4 ²⁾	Type 4 ²⁾	Type 5 ²⁾
Design	2x shielded RJ45 (hub)	2x shielded RJ45 (hub)	1x duplex LC	2x shielded RJ45
Cable length	Max. 100 m between 2 stations (segment length)	Max. 100 m between 2 stations (segment length)	-	Max. 100 m between 2 stations (segment length)
Transfer rate	100 Mbit/s			
Transmission				
Physical layer	100BASE-TX	100BASE-TX	100BASE-FX	100BASE-TX
Half-duplex			Yes	
Full-duplex	No	No	POWERLINK mode: No / Ethernet mode: Yes	No
Autonegotiation	Yes	Yes	No	Yes
Auto-MDI / MDIX	Yes	Yes	No	Yes
Cable fiber type	-	-	Multimode fiber with 62.5/125 µm or 50/125 µm core diameter LC connector on both sides	-
Cable length				
Ethernet TCP/IP	-	-	Max. 400 m between 2 stations (segment length)	-
POWERLINK	-	-	Max. 2 km between 2 stations (segment length)	-

X20IF1082, X20IF1082-2, X20IF1086-2, X20IF2181-2

Environmental conditions	X20IF1082	X20IF1082-2	X20IF1086-2	X20IF2181-2
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20IF1082	X20IF1082-2	X20IF1086-2	X20IF2181-2
Slot			In X20 CPU	

¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

²⁾ See the POWERLINK section of the AS help system under „Communication, POWERLINK, General information, Hardware - IF/LS“.

Interface modules

X20IF1041-1, X20IF1043-1, X20IF1051-1, X20IF1053-1



Short description	X20IF1041-1	X20IF1043-1	X20IF1051-1	X20IF1053-1
Communication module	CANopen master	CANopen slave	DeviceNet scanner (master)	DeviceNet adapter (slave)
General information	X20IF1041-1	X20IF1043-1	X20IF1051-1	X20IF1053-1
Power consumption			1.1 W	
Certification				
CE			Yes	
cULus			Yes	
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL			Yes	
LR			Yes	
GOST-R			Yes	
Interfaces	X20IF1041-1	X20IF1043-1	X20IF1051-1	X20IF1053-1
IF1 interface				
Fieldbus	CANopen master	CANopen slave	DeviceNet scanner (master)	DeviceNet adapter (slave)
Design		5-pin male multipoint connector		
Max. distance	1000 m	1000 m	500 m	500 m
Transfer rate	Max. 1 Mbit/s	Max. 1 Mbit/s	Max. 500 kbit/s	Max. 500 kbit/s
Environmental conditions	X20IF1041-1	X20IF1043-1	X20IF1051-1	X20IF1053-1
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20IF1041-1	X20IF1043-1	X20IF1051-1	X20IF1053-1
Note	Order 1x TB2105 terminal block separately			
Slot	In the X20 CPU and in the X20BC1083 expandable bus controller			

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20IF1061-1, X20IF1063-1, X20IF10E1-1, X20IF10E3-1



Short description	X20IF1061-1	X20IF1063-1	X20IF10E1-1	X20IF10E3-1
Communication module	1x PROFIBUS DP V0/V1 master	1x PROFIBUS DP V0/V1 slave	PROFINET RT controller (master)	PROFINET RT device (slave)
General information	X20IF1061-1	X20IF1063-1	X20IF10E1-1	X20IF10E3-1
Power consumption	1.8 W	1.8 W	2 W	2 W
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2 - ATEX Zone 2 ¹⁾		Yes	-	-
KC			Yes	
GL	Yes	Yes	-	-
LR	Yes	Yes	-	-
GOST-R			Yes	
Interfaces	X20IF1061-1	X20IF1063-1	X20IF10E1-1	X20IF10E3-1
Fieldbus	-	-	PROFINET RT controller (master)	PROFINET RT device (slave)
Design	-	-	2x shielded RJ45 (switch)	2x shielded RJ45 (switch)
Cable length	-	-	Max. 100 m between 2 stations (segment length)	Max. 100 m between 2 stations (segment length)
Transfer rate	-	-	100 Mbit/s	100 Mbit/s
Transmission				
Physical layer	-	-	100BASE-TX	100BASE-TX
Half-duplex	-	-	Yes	Yes
Full-duplex	-	-	Yes	Yes
Autonegotiation	-	-	Yes	Yes
Auto-MDI / MDIX	-	-	Yes	Yes
IF1 interface				
Fieldbus	PROFIBUS DP V0/V1 master	PROFIBUS DP V0/V1 slave	-	-
Design	9-pin female DSUB connector	9-pin female DSUB connector	-	-
Max. distance	1200 m	1200 m	-	-
Transfer rate	Max. 12 Mbit/s	Max. 12 Mbit/s	-	-
Environmental conditions	X20IF1061-1	X20IF1063-1	X20IF10E1-1	X20IF10E3-1
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20IF1061-1	X20IF1063-1	X20IF10E1-1	X20IF10E3-1
Slot			In the X20 CPU and in the X20BC1083 expandable bus controller	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Interface modules

X20IF10D1-1, X20IF10D3-1, X20IF10A1-1, X20IF10G3-1



Short description	X20IF10D1-1	X20IF10D3-1	X20IF10A1-1	X20IF10G3-1
Communication module	EtherNet/IP scanner (master)	EtherNet/IP Adapter (slave)	AS interface master	EtherCAT slave
General information	X20IF10D1-1	X20IF10D3-1	X20IF10A1-1	X20IF10G3-1
Power consumption	2 W	2 W	-	2 W
Power consumption				
Bus	-	-	1.1 W	-
Fieldbus	-	-	0.85 W	-
Certification				
CE			Yes	
cULus			Yes	
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GOST-R			Yes	
Interfaces	X20IF10D1-1	X20IF10D3-1	X20IF10A1-1	X20IF10G3-1
Fieldbus	EtherNet/IP scanner (master)	EtherNet/IP Adapter (slave)	-	EtherCAT (slave)
Design	2x shielded RJ45 (switch)	2x shielded RJ45 (switch)	-	2x shielded RJ45
Cable length	Max. 100 m between 2 stations (segment length)	Max. 100 m between 2 stations (segment length)	-	Max. 100 m between 2 stations (segment length)
Transfer rate	10/100 Mbit/s	10/100 Mbit/s	-	100 Mbit/s
Transmission				
Physical layer	10BASE-T/100BASE-TX	10BASE-T/100BASE-TX	-	100BASE-TX
Half-duplex	Yes	Yes	-	No
Full-duplex	Yes	Yes	-	Yes
Autonegotiation	Yes	Yes	-	Yes
Auto-MDI / MDIX	Yes	Yes	-	Yes
IF1 interface				
Fieldbus	-	-	AS interface master	-
Design	-	-	4-pin male multipoint connector	-
Max. number of slaves	-	-	62	-
Max. distance				
Standard	-	-	100 m	-
With additional components	-	-	500 m	-
Max. cycle time	-	-	5 ms	-
Response time	-	-	Typ. 3 ms	-
Environmental conditions	X20IF10D1-1	X20IF10D3-1	X20IF10A1-1	X20IF10G3-1
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20IF10D1-1	X20IF10D3-1	X20IF10A1-1	X20IF10G3-1
Note	-	-	Order 1x TB704 terminal block separately	-
Slot	In the X20 CPU and in the X20BC1083 expandable bus controller			

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20CS1011, X20CS1012, X20CS1020, X20CS1030, X20CS1070, X20CS2770



Short description	X20CS1011	X20CS1012	X20CS1020	X20CS1030	X20CS1070	X20CS2770
Communication module	1 SmartWire master for controlling up to 16 slaves	1 M-Bus master for controlling up to 64 slaves	1x RS232	1x RS485/RS422	1x CAN bus	2x CAN bus
General information	X20CS1011	X20CS1012	X20CS1020	X20CS1030	X20CS1070	X20CS2770
Power output						
Internal I/O	6.8 W for supplying external slaves (equal to 16 slaves each with 0.425 W)	-	-	-	-	-
Power consumption						
Bus	0.01 W	0.2 W	0.01 W	0.01 W	0.01 W	0.01 W
Internal I/O	1.5 W	0.35 W + (number of slaves * 0.08 W)	1.44 W	1.44 W	1.44 W	1.5 W
Module power dissipation	-	0.55 W + (number of slaves * 0.006 W)	-	-	-	-
Certification						
CE				Yes		
cULus				Yes		
cCSAus HazLoc Class 1 Division 2	Yes	-	Yes	Yes	Yes	Yes
ATEX Zone 2 ¹⁾				Yes		
KC	Yes	-	Yes	Yes	Yes	Yes
GL	-	-	Yes	Yes	Yes	-
LR	-	-	Yes	Yes	Yes	-
GOST-R				Yes		
Interfaces	X20CS1011	X20CS1012	X20CS1020	X20CS1030	X20CS1070	X20CS2770
Interface						
Type	SmartWire (LIN bus)	M-Bus master	-	-	-	-
Design	Connection made using 12-pin X20TB12 terminal block	Connection made using 12-pin X20TB12 terminal block	-	-	-	-
Transfer rate	19200 bit/s	300, 2400 or 9600 bit/s	-	-	-	-
Max. distance	-	See section "M-Bus"	-	-	-	-
Number of slaves	-	Max. 64	-	-	-	-
Bus voltage mark at 0 mA	-	I/O supply voltage (+ 11.5 to 13.5 V)	-	-	-	-
IF1 interface						
Signal	-	-	RS232	RS485/RS422	CAN bus	CAN bus
Design	-	-	Connection made using 12-pin X20TB12 terminal block	Connection made using 12-pin X20TB12 terminal block	Connection made using 12-pin X20TB12 terminal block	Connection made using 12-pin X20TB12 terminal block
Max. distance	-	-	900 m	1200 m	1000 m	1000 m
Transfer rate	-	-	Max. 115.2 kbit/s	Max. 115.2 kbit/s	Max. 1 Mbit/s	Max. 1 Mbit/s

Interface modules

X20CS1011, X20CS1012, X20CS1020, X20CS1030, X20CS1070, X20CS2770

IF2 interface						
Signal	-	-	-	-	-	CAN bus
Design	-	-	-	-	-	Connection made using 12-pin X20TB12 terminal block
Max. distance	-	-	-	-	-	1000 m
Transfer rate	-	-	-	-	-	Max. 1 Mbit/s
Environmental conditions	X20CS1011	X20CS1012	X20CS1020	X20CS1030	X20CS1070	X20CS2770
Temperature						
Operation						
Horizontal installation	0 to 55°C	-25 to 60°C	-25 to 60°C	-25 to 60°C	-25 to 60°C	-25 to 60°C
Vertical installation	0 to 50°C	-25 to 50°C	-25 to 50°C	-25 to 50°C	-25 to 50°C	-25 to 50°C
Mechanical characteristics	X20CS1011	X20CS1012	X20CS1020	X20CS1030	X20CS1070	X20CS2770
Note	Order SmartWire attachment cable X20CA4S00.00xx separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Bus receivers/transmitters

X20BR9300, X20BT9100, X20BT9400



Short description	X20BR9300	X20BT9100	X20BT9400
Bus receiver	X2X Link bus receiver with supply for I/O and bus	-	-
Bus transmitter	-	X2X Link bus transmitter with supply for I/O	X2X Link bus transmitter with supply for I/O and integrated supply for the X67 system
General information	X20BR9300	X20BT9100	X20BT9400
Power consumption ¹⁾			
Bus	1.62 W	0.5 W	0.5 W
Internal I/O	0.6 W	-	-
Internal X67 X2X Link	-	-	1.38 W
Internal I/O			
As bus transmitter	-	0.1 W	0.1 W
Additionally as supply module	-	0.6 W	0.6 W
Electrical isolation			
I/O feed - I/O supply	No	-	-
X2X Link feed - X2X Link supply	Yes	-	-
Certification			
CE			Yes
cULus			Yes
cCSAus HazLoc Class 1 Division 2			Yes
ATEX Zone 2 ²⁾			Yes
KC			Yes
GOST-R			Yes
X67 X2X Link supply input	X20BR9300	X20BT9100	X20BT9400
Input voltage	-	-	24 VDC -15% / +20%
Input current	-	-	Max. 0.5 A
Fuse	-	-	Integrated, cannot be replaced
Reverse polarity protection	-	-	Yes
X67 X2X Link supply output	X20BR9300	X20BT9100	X20BT9400
Parallel connection with X67PS1300	-	-	Yes ³⁾
X67 modules supplied by BT9400			
Horizontal installation	-	-	Max. 8 (Nominal output power: 6 W)
Vertical installation	-	-	Max. 6 (Nominal output power: 4.5 W)
X2X Link input supply	X20BR9300	X20BT9100	X20BT9400
Input voltage	24 VDC -15% / +20%	-	-
Input current	Max. 0.7 A	-	-
Fuse	Integrated, cannot be replaced	-	-
Reverse polarity protection	Yes	-	-
X2X Link supply output	X20BR9300	X20BT9100	X20BT9400
Nominal output power	7 W	-	-
Parallel operation	Yes ⁴⁾	-	-
Redundant operation	Yes	-	-
Overload behavior	Short circuit / temporary overload protection	-	-
Input I/O supply	X20BR9300	X20BT9100	X20BT9400
Input voltage	24 VDC -15% / +20%	24 VDC -15% / +20%	24 VDC -15% / +20%
Fuse			Required line fuse: Max. 10 A, slow-blow

Bus receivers/transmitters

X20BR9300, X20BT9100, X20BT9400

Output I/O supply	X20BR9300	X20BT9100	X20BT9400
Nominal output voltage		24 VDC -15% / +20%	
Permitted contact load		10 A	
Environmental conditions	X20BR9300	X20BT9100	X20BT9400
Temperature			
Operation			
Horizontal installation		-25 to 60°C	
Vertical installation		-25 to 50°C	
Mechanical characteristics	X20BR9300	X20BT9100	X20BT9400
Note	Order 1x X20TB12 terminal block separately Order 1x X20BM01 supply bus module separately Left and right X20 locking plates included in delivery	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 or X20BM15 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 or 1x X20BM15 bus module separately

¹⁾ The specified values are maximum values. The exact calculation is also available for download as a data sheet with the other module documentation on the B&R website.

²⁾ Ta min.: 0°C
Ta max.: See environmental conditions

³⁾ Only the PS1300 can be used for calculating the total number of X67 modules.

⁴⁾ In parallel operation, only 75% of the nominal power can be assumed. It is important to make sure that all power supplies operated in parallel are switched on and off at the same time.

Power supply modules

X20PS2100, X20PS2110, X20PS3300, X20PS3310



Short description	X20PS2100	X20PS2110	X20PS3300	X20PS3310
Power supply module	24 VDC supply module for internal I/O supply	24 VDC supply module for internal I/O supply	24 VDC supply module for I/O and bus	24 VDC supply module for I/O and bus
General information	X20PS2100	X20PS2110	X20PS3300	X20PS3310
Power consumption ¹⁾				
Bus	0.2 W	0.2 W	1.31 W	1.31 W
Internal I/O	0.6 W	0.82 W	0.6 W	0.82 W
Electrical isolation				
I/O feed - I/O supply			No	
X2X Link feed - X2X Link supply	-	-	Yes	Yes
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2			Yes	
ATEX Zone 2 ²⁾			Yes	
KC			Yes	
GL	Yes	-	Yes	-
LR	Yes	-	Yes	-
GOST-R			Yes	
X2X Link input supply	X20PS2100	X20PS2110	X20PS3300	X20PS3310
Input voltage	-	-	24 VDC -15% / +20%	24 VDC -15% / +20%
Input current	-	-	Max. 0.7 A	Max. 0.7 A
Fuse	-	-	Integrated, cannot be replaced	Integrated, cannot be replaced
Reverse polarity protection	-	-	Yes	Yes
X2X Link supply output	X20PS2100	X20PS2110	X20PS3300	X20PS3310
Nominal output power	-	-	7 W	7 W
Parallel operation	-	-	Yes ³⁾	Yes ³⁾
Redundant operation	-	-	Yes	Yes
Overload behavior	-	-	Short circuit / temporary overload protection	Short circuit / temporary overload protection
Input I/O supply	X20PS2100	X20PS2110	X20PS3300	X20PS3310
Input voltage			24 VDC -15% / +20%	
Input current	-	Max. 6 A	-	Max. 6 A
Fuse	Required line fuse: Max. 10 A, slow-blow	Integrated 6.3 A, slow-blow, can be replaced	Required line fuse: Max. 10 A, slow-blow	Integrated 6.3 A, slow-blow, can be replaced
Output I/O supply	X20PS2100	X20PS2110	X20PS3300	X20PS3310
Nominal output voltage			24 VDC	
Permitted contact load	10 A	6 A	10 A	6 A
Environmental conditions	X20PS2100	X20PS2110	X20PS3300	X20PS3310
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20PS2100	X20PS2110	X20PS3300	X20PS3310
Note			Order 1x X20TB12 terminal block separately Order 1x X20BM01 supply bus module separately	

¹⁾ The specified values are maximum values. The exact calculation is also available for download as a data sheet with the other module documentation on the B&R website.

²⁾ Ta min.: 0°C
Ta max.: See environmental conditions

³⁾ In parallel operation, only 75% of the nominal power can be assumed. It is important to make sure that all power supplies operated in parallel are switched on and off at the same time.

Dummy modules

X20ZF0000, X20ZF000F



Short description	X20ZF0000	X20ZF000F
Accessories		Non-functional dummy module
General information	X20ZF0000	X20ZF000F
Certification		
CE		Yes
cULus		Yes
ATEX Zone 2 ¹⁾		Yes
GL	Yes	-
Environmental conditions	X20ZF0000	X20ZF000F
Temperature		
Operation		
Horizontal installation		-25 to 60°C
Vertical installation		-25 to 50°C
Mechanical characteristics	X20ZF0000	X20ZF000F
Note	Order 1x X20TB06 or 1x X20TB12 terminal block separately Order 1x X20BM11 bus module or 1x X20BM01 supply bus module separately	Order 1x X20TB1E or 1x X20TB1F terminal block separately Order 1x X20BM11 bus module or 1x X20BM01 supply bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20IF0000



Short description

Accessories Non-functional dummy module

General information

Certification

CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
GL	Yes
LR	Yes

Environmental conditions

Temperature

Operation

Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Slot In X20 CPU, X20BB3x and X20BB8x

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Modules for the X20 hub system

X20HB8880, X20HB8815, X20ET8819



Short description	X20HB8880	X20HB8815	X20ET8819
Hub	Modular X20 hub with up to 2 slots for hub expansion modules:	-	-
Gateway	-	POWERLINK controlled node with up to 2 slots for hub expansion modules	-
Ethernet analysis tool	-	-	Ethernet analysis tool with up to 2 slots for hub expansion modules
General information	X20HB8880	X20HB8815	X20ET8819
Power consumption		2 W	
Certification			
CE		Yes	
cULus		Yes	
cCSAus HazLoc Class 1 Division 2	Yes	-	-
ATEX Zone 2 ¹⁾		Yes	
KC		Yes	
GL	Yes	-	-
LR	Yes	-	-
GOST-R		Yes	
Interfaces	X20HB8880	X20HB8815	X20ET8819
Type	Hub base module	POWERLINK gateway	Ethernet analysis tool
Design		2x shielded RJ45	
Cable length		Max. 100 m between 2 stations (segment length)	
Transfer rate	100 Mbit/s	-	100 Mbit/s
Transfer rate			
POWERLINK	-	100 Mbit/s	-
TCP/IP	-	10/100 Mbit/s	-
Transmission			
Physical layer	100BASE-TX	-	100BASE-TX
Half-duplex	Yes	-	Yes
Full-duplex	No	-	Yes
Autonegotiation	Yes	-	Yes
Auto-MDI / MDIX	Yes	-	Yes
POWERLINK			
Physical layer	-	100BASE-TX	-
Half-duplex	-	Yes	-
Full-duplex	-	No	-
Autonegotiation	-	Yes	-
Auto-MDI / MDIX	-	Yes	-
TCP/IP			
Physical layer	-	10BASE-T/100BASE-TX	-
Half-duplex	-	Yes	-
Full-duplex	-	Yes	-
Autonegotiation	-	Yes	-
Auto-MDI / MDIX	-	Yes	-
Environmental conditions	X20HB8880	X20HB8815	X20ET8819
Temperature			
Operation			
Horizontal installation		-25 to 60°C	
Vertical installation		-25 to 50°C	

X20HB8880, X20HB8815, X20ET8819

Mechanical characteristics	X20HB8880	X20HB8815	X20ET8819
Note	Order 1x X20TB12 terminal block separately Order 1x X20PS8002 power supply module separately Order 1x X20BB8x bus base separately	Order 1x X20TB12 terminal block separately Order 1x X20PS8002 power supply module separately Order 1x X20BB8x bus base separately	Order 1x X20TB12 terminal block separately Order 1x X20PS9400 power supply module separately Order 1x X20BB8x bus base separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

System modules for the X20 hub system

X20PS8002



Short description

Power supply module 24 VDC supply module for X20 standalone devices

General information

Power consumption ¹⁾ 1.34 W

Electrical isolation

I/O supply - Device supply No

Certification

CE Yes

cULus Yes

cCSAus HazLoc Class 1 Division 2 Yes

ATEX Zone 2 ²⁾ Yes

KC Yes

GOST-R Yes

Input supply

Input voltage 24 VDC -15% / +20%

Input current Max. 0.7 A

Fuse Integrated, cannot be replaced

Reverse polarity protection Yes

Output supply

Nominal output power

Horizontal installation 7 W at 45°C and 5 W at 55°C

Vertical installation 7 W at 40°C and 5 W at 50°C

Environmental conditions

Temperature

Operation

Horizontal installation -25 to 60°C

Vertical installation -25 to 50°C

Mechanical characteristics

Note Order 1x X20TB12 terminal block separately

¹⁾ The specified values are maximum values. The exact calculation is included as a data sheet in the module documentation and can be downloaded from the B&R website.

²⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20HB2880, X20HB1881, X20HB2881



Short description	X20HB2880	X20HB1881	X20HB2881
Hub	2 Fast Ethernet hubs for hub expansion	1 Fast Ethernet interface for fiber optic cable for hub expansion	2 Fast Ethernet interfaces for fiber optic cable for hub expansion
General information	X20HB2880	X20HB1881	X20HB2881
Power consumption	1.17 W	1.45 W (Rev. <D0: 1.65 W)	2.3 W (Rev. <E0: 2.8 W)
Certification			
CE			Yes
cULus			Yes
cCSAus HazLoc Class 1 Division 2	Yes	-	-
ATEX Zone 2 ¹⁾			Yes
KC			Yes
GL	Yes	-	-
LR	Yes	-	-
GOST-R			Yes
Interfaces	X20HB2880	X20HB1881	X20HB2881
Type		Hub expansion module	
Design	2x shielded RJ45	1x duplex LC female	2x duplex LC female
Cable length	Max. 100 m between 2 stations (segment length)	-	-
Transfer rate		100 Mbit/s	
Transmission			
Physical layer	100BASE-TX	100BASE-FX	100BASE-FX
Half-duplex			Yes
Full-duplex			No
Autonegotiation	Yes	No	No
Auto-MDI / MDIX	Yes	No	No
Cable fiber type	-	Multimode fiber with 62.5/125 µm or 50/125 µm core diameter On both sides: Duplex LC male connector	Multimode fiber with 62.5/125 µm or 50/125 µm core diameter On both sides: Duplex LC male connector
Cable length			
Half-duplex	-	Max. 400 m between 2 stations (segment length)	Max. 400 m between 2 stations (segment length)
POWERLINK	-	Max. 2 km between 2 stations (segment length)	Max. 2 km between 2 stations (segment length)
Environmental conditions	X20HB2880	X20HB1881	X20HB2881
Temperature			
Operation			
Horizontal installation	-25 to 60°C	-25 to 60°C	-
Horizontal installation (with 1 hub)	-	-	-25 to 55°C (Rev. <E0: 0 to 45°C)
Horizontal installation (with ≥2 hubs)	-	-	-25 to 50°C (Rev. <E0: 0 to 40°C)
Vertical installation	-25 to 50°C	-25 to 50°C	-
Vertical installation (with 1 hub)	-	-	-25 to 40°C (Rev. <E0: 0 to 40°C)
Vertical installation (with ≥2 hubs)	-	-	-25 to 35°C (Rev. <E0: 0 to 35°C)

System modules for the X20 hub system

X20HB2880, X20HB1881, X20HB2881

Mechanical characteristics

	X20HB2880	X20HB1881	X20HB2881
Slot	Hub expansion for X20BC8083 and X20HB8880	Hub expansion for X20BC8083, X20BC8084 and X20HB8880 ²⁾	Hub expansion for X20BC8083 and X20HB8880 ³⁾

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ The hardware revision of X20BC8083 and X20HB8880 must be ≥F0 and the hardware revision of X20BC8084 must be ≥D0.

³⁾ The hardware revision of X20BC8083 and X20HB8880 must be ≥F0.

Modules for the X20 redundancy system

X20HB8884



Short description

POWERLINK compact link selector	Connects POWERLINK devices to a redundant POWERLINK network
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General information

Power consumption	2 W
Certification	
CE	Yes
cULus	Yes
cCSAus HazLoc Class 1 Division 2	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	Yes
LR	Yes
GOST-R	Yes

Interfaces

Type	POWERLINK compact link selector
Design	2x shielded RJ45
Cable length	Max. 100 m between 2 stations (segment length)
Transfer rate	100 Mbit/s
Transmission	
Physical layer	100BASE-TX
Half-duplex	Yes
Full-duplex	No
Autonegotiation	Yes
Auto-MDI / MDIX	Yes

Environmental conditions

Temperature	
Operation	
Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20PS8002 power supply module separately Order 1x X20HB2880 or 2x X20HB2885 hub expansion module separately Order 1x X20BB81 or X20BB82 bus base separately
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¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

System modules for the X20 redundancy system

X20HB2885, X20HB2886



Short description	X20HB2885	X20HB2886
Hub	2 Fast Ethernet hubs for redundant wiring	2 Fast Ethernet interfaces for fiber optic cable for redundant wiring
General information	X20HB2885	X20HB2886
Power consumption	1.17 W	2.3 W (Rev. <D0: 2.8 W)
Certification		
CE		Yes
cULus		Yes
cCSAus HazLoc Class 1 Division 2	Yes	-
ATEX Zone 2 ¹⁾		Yes
KC		Yes
GOST-R		Yes
Interfaces	X20HB2885	X20HB2886
Type		Active hub expansion module
Design	2x shielded RJ45	2x duplex LC female
Cable length	Max. 100 m between 2 stations (segment length)	-
Transfer rate		100 Mbit/s
Transmission		
Physical layer	100BASE-TX	100BASE-FX
Half-duplex		Yes
Full-duplex		No
Autonegotiation	Yes	No
Auto-MDI / MDIX	Yes	No
Hub runtime		0.96 to 1 µs
Cable fiber type	-	Multimode fiber with 62.5/125 µm or 50/125 µm core diameter On both sides: Duplex LC male connector
Cable length		
Half-duplex	-	Max. 400 m between 2 stations (segment length)
POWERLINK	-	Max. 2 km between 2 stations (segment length)
Environmental conditions	X20HB2885	X20HB2886
Temperature		
Operation		
Horizontal installation	-25 to 60°C	-
Horizontal installation (with ≥2 hubs)	-	-25 to 50°C (Rev. <D0: 0 to 40°C)
Vertical installation	-25 to 50°C	-
Vertical installation (with ≥2 hubs)	-	-25 to 35°C (Rev. <D0: 0 to 35°C)
Mechanical characteristics	X20HB2885	X20HB2886
Slot	Hub expansion for X20BC8084 and X20HB8884	Hub expansion for X20BC8084 and X20HB8884 ²⁾

¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

²⁾ The hardware revision of X20BC8084 and X20HB8884 must be ≥E0.

Digital input modules

X20DI2371, X20DI2372, X20DI4371, X20DI4372, X20DI4375



Short description	X20DI2371	X20DI2372	X20DI4371	X20DI4372	X20DI4375
I/O module	2 digital inputs 24 VDC for 3-wire connections	2 digital inputs 24 VDC for 3-wire connections	4 digital inputs 24 VDC for 3-wire connections	4 digital inputs 24 VDC for 3-wire connections	4 digital inputs 24 VDC for 3-wire connections, open line and short circuit detection, detection can be switched off individually for each channel
General information	X20DI2371	X20DI2372	X20DI4371	X20DI4372	X20DI4375
Power consumption					
Bus	0.12 W	0.12 W	0.14 W	0.14 W	0.01 W
Internal I/O	0.29 W	0.29 W	0.59 W	0.59 W	1.1 W
Certification					
CE			Yes		
cULus			Yes		
cCSAus HazLoc Class 1 Division 2	Yes	Yes	Yes	Yes	-
ATEX Zone 2 ¹⁾			Yes		
KC			Yes		
GL			Yes		
LR			Yes		
GOST-R			Yes		
Digital inputs	X20DI2371	X20DI2372	X20DI4371	X20DI4372	X20DI4375
Nominal voltage	24 VDC				
Input filter					
Hardware	≤100 μs	≤100 μs	≤100 μs	≤100 μs	0.8 ms
Software	Default 1 ms, configurable between 0 and 25 ms in 0.2 ms intervals				
Connection type	3-wire connections				
Input circuit	Sink	Source	Sink	Source	Sink
Open circuit and short circuit detection	-	-	-	-	Yes, can be switched off individually for each channel
Event counter	X20DI2371	X20DI2372	X20DI4371	X20DI4372	X20DI4375
Quantity	-	-	4	-	-
Signal form	-	-	Square wave pulse	-	-
Evaluation	-	-	Configurable edge event, cyclic counter	-	-
Input frequency	-	-	Max. 1 kHz	-	-
Counter size	-	-	16-bit	-	-
Environmental conditions	X20DI2371	X20DI2372	X20DI4371	X20DI4372	X20DI4375
Temperature					
Operation					
Horizontal installation			-25 to 60°C		
Vertical installation			-25 to 50°C		
Mechanical characteristics	X20DI2371	X20DI2372	X20DI4371	X20DI4372	X20DI4375
Note	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Digital input modules

X20DI6371, X20DI6372, X20DI6373, X20DID371



Short description	X20DI6371	X20DI6372	X20DI6373	X20DID371
I/O module	6 digital inputs 24 VDC for 1- or 2-wire connections	6 digital inputs 24 VDC for 1- or 2-wire connections	6 digital floating inputs - 24 VDC	8 digital inputs 24 VDC for 1- or 2-wire connections
General information	X20DI6371	X20DI6372	X20DI6373	X20DID371
Power consumption				
Bus	0.15 W	0.15 W	0.15 W	0.13 W
Internal I/O	0.88 W	0.88 W	0.88 W	1.2 W
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2	Yes	Yes	-	-
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL			Yes	
LR			Yes	
GOST-R			Yes	
Digital inputs	X20DI6371	X20DI6372	X20DI6373	X20DID371
Nominal voltage			24 VDC	
Input filter				
Hardware			≤100 μs	
Software			Default 1 ms, configurable between 0 and 25 ms in 0.2 ms intervals	
Connection type	1- or 2-wire connections	1- or 2-wire connections	-	1- or 2-wire connections
Input circuit	Sink	Source	Sink or source	Sink
Environmental conditions	X20DI6371	X20DI6372	X20DI6373	X20DID371
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20DI6371	X20DI6372	X20DI6373	X20DID371
Note	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB1F terminal block separately Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20DI8371, X20DI9371, X20DI9372, X20DIF371



Short description	X20DI8371	X20DI9371	X20DI9372	X20DIF371
I/O module	8 digital inputs 24 VDC for 1-wire connections	12 digital inputs 24 VDC for 1-wire connections	12 digital inputs 24 VDC for 1-wire connections	16 digital inputs 24 VDC for 1-wire connections
General information	X20DI8371	X20DI9371	X20DI9372	X20DIF371
Power consumption				
Bus			0.18 W	
Internal I/O	-	-	1.75 W	-
External I/O	1.2 W	1.75 W	-	1.47 W
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2	Yes	Yes	Yes	-
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL			Yes	
LR			Yes	
GOST-R			Yes	
Digital inputs	X20DI8371	X20DI9371	X20DI9372	X20DIF371
Nominal voltage			24 VDC	
Input filter				
Hardware			≤100 μs	
Software			Default 1 ms, configurable between 0 and 25 ms in 0.2 ms intervals	
Connection type			1-wire connections	
Input circuit	Sink	Sink	Source	Sink
Simultaneity				
With 24 V I/O supply	-	-	-	100% ²⁾
With 28.8 V I/O supply	-	-	-	75% ²⁾
Environmental conditions	X20DI8371	X20DI9371	X20DI9372	X20DIF371
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20DI8371	X20DI9371	X20DI9372	X20DIF371
Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB1F terminal block separately Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions
²⁾ Derating must be taken into consideration.

Digital input modules

X20DI2377



Short description

I/O module 2 digital inputs 24 VDC for 3-wire connections, special functions

General information

Power consumption

Bus	0.15 W
Internal I/O	0.82 W

Certification

CE	Yes
cULus	Yes
cCSAus HazLoc Class 1 Division 2	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	Yes
LR	Yes
GOST-R	Yes

Digital inputs

Nominal voltage 24 VDC

Input filter

Hardware	≤10 μs
Software	Default 0 ms, configurable between 0 and 25 ms in 0.2 ms intervals

Connection type 3-wire connections

Input circuit Sink

Additional functions 50 kHz event counting, gate measurement

Event counter

Quantity	2
Signal form	Square wave pulse
Evaluation	Every rising edge, cyclic counter
Input frequency	Max. 50 kHz
Counter size	16-bit

Gate measurement

Signal form	Square wave pulse
Evaluation	Rising edge - falling edge
Counter frequency	
Internal	48 MHz, 24 MHz, 12 MHz, 6 MHz, 3 MHz, 1.5 MHz, 750 kHz, 375 kHz, 187.5 kHz
Counter size	16-bit

Environmental conditions

Temperature

Operation	
Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Note Order 1x X20TB06 or X20TB12 terminal block separately
Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20DI4760



Short description

I/O module	4 NAMUR inputs, special function
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General information

Power consumption	
Bus	0.01 W
Internal I/O	1.5 W

Certification	
CE	Yes
cULus	Yes
cCSAus HazLoc Class 1 Division 2	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	Yes
LR	Yes
GOST-R	Yes

Event counter

Quantity	4
Signal form	Symmetrical square wave pulse or corresponding minimum pulse duration ²⁾
Evaluation	Every rising edge, cyclic counter
Counter size	8-bit
Input frequency	
1 input active	Max. 1600 Hz
2 inputs active	Max. 1100 Hz
3 inputs active	Max. 870 Hz
4 inputs active	Max. 680 Hz

NAMUR inputs

Input circuit	For NAMUR encoders in accordance with EN 60947-5-6
No load voltage	8.05 V ±0.33%
Input delay	
1 input active	≤310 µs
2 inputs active	≤450 µs
3 inputs active	≤570 µs
4 inputs active	≤735 µs

Environmental conditions

Temperature	
Operation	
Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately
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¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Minimum pulse duration: $t[s] \geq 1/(2 \times f_{max}[Hz])$

Digital input modules

X20DI2653, X20DI4653, X20DI6553



Short description	X20DI2653	X20DI4653	X20DI6553
I/O module	2 digital inputs 100 to 240 VAC for 3-wire connections	4 digital inputs 100 to 240 VAC for 2-wire connections	6 digital inputs 100 to 120 VAC for 1-wire connections
General information	X20DI2653	X20DI4653	X20DI6553
Power consumption			
Bus	0.14 W	0.17 W	0.21 W
Internal I/O		-	
External I/O	0.55 W	0.91 W	0.68 W
Certification			
CE		Yes	
cULus		Yes	
cCSAus HazLoc Class 1 Division 2		Yes	
ATEX Zone 2 ¹⁾		Yes	
KC		Yes	
GOST-R		Yes	
Digital inputs	X20DI2653	X20DI4653	X20DI6553
Nominal voltage	100 to 240 VAC	100 to 240 VAC	100 to 120 VAC
Input filter			
Software	Default 1 ms, configurable between 0 and 25 ms in 0.2 ms intervals		
Hardware			
1 -> 0		≤30 ms	
0 -> 1	≤40 ms	≤40 ms	≤15 ms
Connection type	3-wire connections	2-wire connections	1-wire connections
Nominal frequency		47 to 63 Hz	
Environmental conditions	X20DI2653	X20DI4653	X20DI6553
Temperature			
Operation			
Horizontal installation		-25 to 60°C	
Vertical installation		-25 to 50°C	
Mechanical characteristics	X20DI2653	X20DI4653	X20DI6553
Note		Order 1x X20TB32 terminal block separately Order 1x X20BM12 bus module separately	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Digital output modules

X20DO2321, X20DO2322, X20DO4321, X20DO4322



Short description	X20DO2321	X20DO2322	X20DO4321	X20DO4322
I/O module	2 digital outputs 24 VDC for 3-wire connections	2 digital outputs 24 VDC for 3-wire connections	4 digital outputs 24 VDC for 3-wire connections	4 digital outputs 24 VDC for 3-wire connections
General information	X20DO2321	X20DO2322	X20DO4321	X20DO4322
Power consumption				
Bus	0.13 W	0.13 W	0.16 W	0.16 W
Internal I/O	0.3 W	0.33 W	0.49 W	0.49 W
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2			Yes	
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL	-	Yes	-	Yes
LR	-	Yes	-	Yes
GOST-R			Yes	
Digital outputs	X20DO2321	X20DO2322	X20DO4321	X20DO4322
Design	FET negative switching	FET positive switching	FET negative switching	FET positive switching
Nominal voltage	24 VDC			
Nominal output current	0.5 A			
Total nominal current	1 A	1 A	2 A	2 A
Connection type	3-wire connections			
Output circuit	Sink	Source	Sink	Source
Output protection	Thermal cutoff if overcurrent or short circuit occurs (see value "Peak short circuit current") Internal inverse diode for switching inductive loads (see section "Switching inductive loads")			
Actuator supply	0.5 A in total for output-independent actuator supply			
Environmental conditions	X20DO2321	X20DO2322	X20DO4321	X20DO4322
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20DO2321	X20DO2322	X20DO4321	X20DO4322
Note	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Digital output modules

X20DO4331, X20DO4332, X20DO6321, X20DO6322, X20DO6325, X20DOD322



Short description	X20DO4331	X20DO4332	X20DO6321	X20DO6322	X20DO6325	X20DOD322
I/O module	4 digital outputs 24 VDC for 3-wire connections	4 digital outputs 24 VDC for 3-wire connections	6 digital outputs 24 VDC for 1- or 2-wire connections	6 digital outputs 24 VDC for 1- or 2-wire connections	6 digital outputs 24 VDC for 1- or 2-wire con- nections with a diagnostics function	8 digital outputs 24 VDC for 1- or 2-wire connections
General information	X20DO4331	X20DO4332	X20DO6321	X20DO6322	X20DO6325	X20DOD322
Power consumption						
Bus	0.16 W	0.16 W	0.2 W	0.18 W	0.15 W	0.19 W
Internal I/O	0.49 W	0.49 W	0.59 W	0.71 W	0.4 W	0.8 W
Certification						
CE				Yes		
cULus				Yes		
cCSAus HazLoc Class 1 Division 2	Yes	Yes	Yes	Yes	-	-
ATEX Zone 2 ¹⁾				Yes		
KC	Yes	Yes	Yes	Yes	-	Yes
GL	-	-	-	Yes	-	Yes
LR	-	-	-	Yes	-	Yes
GOST-R				Yes		
Digital outputs	X20DO4331	X20DO4332	X20DO6321	X20DO6322	X20DO6325	X20DOD322
Design	FET negative switching	FET positive switching	FET negative switching	FET positive switching	FET positive switching	FET positive switching
Nominal voltage	24 VDC					
Nominal output current	2 A	2 A	0.5 A	0.5 A	0.5 A	0.5 A
Total nominal current	8 A	8 A (Rev. <H0: 4 A)	3 A	3 A	3 A	4 A
Connection type	3-wire connections	3-wire connections	1- or 2-wire connections	1- or 2-wire connections	1- or 2-wire connections	1- or 2-wire connections
Output circuit	Sink	Source	Sink	Source	Source	Source
Output protection	Thermal cutoff if overcurrent or short circuit occurs (see value "Peak short circuit current") Internal inverse diode for switching inductive loads (see section "Switching inductive loads")					
Actuator supply	0.5 A in total for output-independ- ent actuator supply	0.5 A in total for output-independ- ent actuator supply	-	-	-	-
Environmental conditions	X20DO4331	X20DO4332	X20DO6321	X20DO6322	X20DO6325	X20DOD322
Temperature						
Operation						
Horizontal installation				-25 to 60°C		
Vertical installation				-25 to 50°C		
Mechanical characteristics	X20DO4331	X20DO4332	X20DO6321	X20DO6322	X20DO6325	X20DOD322
Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module sepa- rately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module sepa- rately	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module sepa- rately	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module sepa- rately	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module sepa- rately	Order 1x X20TB1F terminal block separately Order 1x X20BM11 bus module sepa- rately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20DO8322, X20DO8323, X20DO8331, X20DO8332



Short description	X20DO8322	X20DO8323	X20DO8331	X20DO8332
I/O module	8 digital outputs 24 VDC for 1-wire connections	8 digital outputs 11.5 to 30 V for 1-wire connections	8 digital outputs 24 VDC for 1-wire connections	8 digital outputs 24 VDC for 1-wire connections
General information	X20DO8322	X20DO8323	X20DO8331	X20DO8332
Power consumption				
Bus	0.26 W	160 mW	0.22 W	0.22 W
Internal I/O	0.8 W	200 mW (without load)	-	-
External I/O	-	-	0.9 W	0.92 W
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2	Yes	-	Yes	Yes
ATEX Zone 2 ¹⁾			Yes	
KC	Yes	-	Yes	Yes
GL	Yes	-	-	Yes
LR	Yes	-	-	Yes
GOST-R			Yes	
Digital outputs	X20DO8322	X20DO8323	X20DO8331	X20DO8332
Design	FET positive switching	FET push/pull (high resistance)	FET negative switching	FET positive switching
Number of output groups	-	-	-	2
Nominal voltage	24 VDC	11.5 to 30 V	24 VDC	24 VDC
Nominal output current	0.5 A	0.5 A	2 A	2 A
Total nominal current	4 A	4 A	8 A	-
Total nominal current				
Per group	-	-	-	4 A
Per module	-	-	-	8 A ²⁾
Connection type	1-wire connections			
Output circuit	Source	Sink / source	Sink	Source
Output protection	Thermal cutoff if overcurrent or short circuit occurs (see value "Peak short circuit current") Internal inverse diode for switching inductive loads (see section "Switching inductive loads")	-	Thermal cutoff if overcurrent or short circuit occurs (see value "Peak short circuit current") Internal inverse diode for switching inductive loads (see section "Switching inductive loads") Reverse polarity protection for supply voltage	Thermal cutoff if overcurrent or short circuit occurs (see value "Peak short circuit current") Internal inverse diode for switching inductive loads (see section "Switching inductive loads") Reverse polarity protection for supply voltage
Actuator supply				
Supply	-	-	External	External
Fuse	-	-	Required line fuse: Max. 10 A, slow-blow	Required line fuse: Max. 10 A, slow-blow
Environmental conditions	X20DO8322	X20DO8323	X20DO8331	X20DO8332
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20DO8322	X20DO8323	X20DO8331	X20DO8332
Note			Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Derating may be necessary with more than 6 A summation current.

Digital output modules

X20DO9321, X20DO9322, X20DOF322



Short description	X20DO9321	X20DO9322	X20DOF322
I/O module	12 digital outputs 24 VDC for 1-wire connections	12 digital outputs 24 VDC for 1-wire connections	16 digital outputs 24 VDC for 1-wire connections
General information	X20DO9321	X20DO9322	X20DOF322
Power consumption			
Bus	0.26 W	0.26 W	0.28 W
Internal I/O	0.99 W	1.15 W	0.95 W
Certification			
CE		Yes	
cULus		Yes	
cCSAus HazLoc Class 1 Division 2	Yes	Yes	-
ATEX Zone 2 ¹⁾		Yes	
KC		Yes	
GL	-	Yes	Yes
LR	-	Yes	Yes
GOST-R		Yes	
Digital outputs	X20DO9321	X20DO9322	X20DOF322
Design	FET negative switching	FET positive switching	FET positive switching
Nominal voltage	24 VDC		
Nominal output current	0.5 A		
Total nominal current	6 A	6 A	8 A
Connection type	1-wire connections		
Output circuit	Sink	Source	Source
Output protection	Thermal cutoff if overcurrent or short circuit occurs (see value "Peak short circuit current") Internal inverse diode for switching inductive loads (see section "Switching inductive loads")		
Environmental conditions	X20DO9321	X20DO9322	X20DOF322
Temperature			
Operation			
Horizontal installation		-25 to 60°C	
Vertical installation		-25 to 50°C	
Mechanical characteristics	X20DO9321	X20DO9322	X20DOF322
Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB1F terminal block separately Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20DO2649, X20DO4529, X20DO4649, X20DO6529

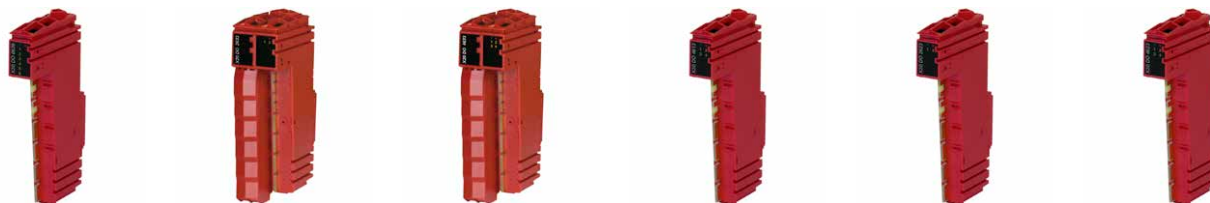


Short description	X20DO2649	X20DO4529	X20DO4649	X20DO6529
I/O module	2 digital outputs 30 VDC / 240 VAC, outputs are single-channel isolated	4 digital outputs 30 VDC / 115 VAC, outputs are single-channel isolated	4 digital outputs 30 VDC / 240 VAC, outputs are single-channel isolated	6 digital outputs 30 VDC / 115 VAC, outputs are single-channel isolated
General information	X20DO2649	X20DO4529	X20DO4649	X20DO6529
Power consumption				
Bus	0.45 W	0.8 W	0.8 W	1.1 W
Internal I/O			-	
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2			Yes	
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL			Yes	
LR	Yes	Yes	-	Yes
GOST-R			Yes	
Digital outputs	X20DO2649	X20DO4529	X20DO4649	X20DO6529
Design	Relay / Changeover contact Channels are single-channel isolated	Relay / Changeover contact Channels are single-channel isolated	Relay / Normally open contact Channels are single-channel isolated	Relay / Normally open contact Channels are single-channel isolated
Nominal voltage	30 VDC / 240 VAC	30 VDC / 115 VAC	30 VDC / 240 VAC	30 VDC / 115 VAC
Nominal frequency	DC / 45 to 63 Hz			
Nominal output current	5 A at 30 VDC / 5 A at 240 VAC	1 A at 30 VDC / 0.5 A at 115 VAC	5 A at 30 VDC / 5 A at 240 VAC	1 A at 30 VDC / 0.5 A at 115 VAC
Total nominal current	10 A at 30 VDC / 10 A at 240 VAC	4 A at 30 VDC / 2 A at 115 VAC	10 A at 30 VDC / 10 A at 240 VAC	6 A at 30 VDC / 3 A at 115 VAC
Actuator supply	External			
Switching capacity				
Minimum	10 mA / 5 VDC	0.01 mA / 10 mV DC	0.05 W / 2.4 VA	0.01 mA / 10 mV DC
Maximum	180 W / 1500 VA	30 W / 62.5 VA	150 W / 1250 VA	30 W / 62.5 VA
Environmental conditions	X20DO2649	X20DO4529	X20DO4649	X20DO6529
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20DO2649	X20DO4529	X20DO4649	X20DO6529
Note		Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately		

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Digital output modules

X2DO6639, X2DO2633, X2DO4633, X2DO4613, X2DO2623, X2DO4623



Short description	X2DO6639	X2DO2633	X2DO4633	X2DO4613	X2DO2623	X2DO4623
I/O module	6 digital outputs 30 VDC / 240 VAC, outputs are single-channel isolated	2 digital outputs 12 to 240 VAC for 3-wire connections	4 digital outputs 12 to 240 VAC for 2-wire connections	4 digital outputs for controlling external power triacs or non-parallel thyristors	2 digital SSR outputs 100 to 240 VAC for 3-wire connections	4 digital SSR outputs 100 to 240 VAC for 2-wire connections
General information	X2DO6639	X2DO2633	X2DO4633	X2DO4613	X2DO2623	X2DO4623
Power consumption						
Bus	1 W	0.6 W	0.6 W	0.8 W	0.35 W	0.52 W
Internal I/O	-	-	-	-	-	-
External I/O	-	-	-	-	0.38 W	0.38 W
Certification						
CE	-	-	-	Yes	-	-
cULus	-	-	-	Yes	-	-
cCSAus HazLoc Class 1 Division 2	-	-	-	-	Yes	Yes
ATEX Zone 2 ¹⁾	-	-	-	Yes	-	-
KC	-	Yes	Yes	Yes	Yes	Yes
GL	Yes	-	-	-	-	-
GOST-R	-	-	-	Yes	-	-
Digital outputs	X2DO6639	X2DO2633	X2DO4633	X2DO4613	X2DO2623	X2DO4623
Design	Relay / Normally open contact Channels are single-channel isolated	Triac	Triac	Opto-triac	SSR	SSR
Wiring	-	L switching	L switching	N.O. contact	L switching	L switching
Nominal voltage	30 VDC / 240 VAC	12 to 240 VAC	12 to 240 VAC	48 to 240 VAC	100 to 240 VAC	100 to 240 VAC
Nominal frequency	DC / 45 to 63 Hz	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz
Nominal current at 25°C						
Nominal output current	-	-	-	80 mA	-	-
Total nominal current	-	-	-	320 mA	-	-
Current over entire temperature range						
Output current	-	-	-	50 mA	-	-
Summation current	-	-	-	200 mA	-	-
Nominal output current	2 A at 30 VDC / 2 A at 240 VAC	2 A	1 A	-	1 A	0.5 A
Total nominal current	10 A at 30 VDC / 10 A at 240 VAC	4 A	4 A	-	1 A	1 A
Maximum current						
Output current	-	2.5 A	1.25 A	-	-	-
Summation current	-	5 A	5 A	-	-	-
Surge current	-	-	-	-	40 A (20 ms), 10 A (1 s)	7 A (20 ms), 2 A (1 s)
Connection type	-	3-wire connections	2-wire connections	2-wire connections	3-wire connections	2-wire connections
Actuator supply	External	-	-	-	-	-
Zero crossing switches	-	-	-	-	Yes	Yes
Zero-crossing detection	-	Yes	Yes	Yes	-	-

X20DO6639, X20DO2633, X20DO4633, X20DO4613, X20DO2623, X20DO4623

Switching capacity						
Minimum	0.05 W DC / 2.4 W AC	-	-	-	-	-
Maximum	60 W DC / 480 W AC	-	-	-	-	-
Total power of all channels						
AC	3000 W	-	-	-	-	-
DC	360 W	-	-	-	-	-
Environmental conditions	X20DO6639	X20DO2633	X20DO4633	X20DO4613	X20DO2623	X20DO4623
Temperature						
Operation						
Horizontal installation				-25 to 60°C		
Vertical installation				-25 to 50°C		
Mechanical characteristics	X20DO6639	X20DO2633	X20DO4633	X20DO4613	X20DO2623	X20DO4623
Note	Order 1x X20TB32 terminal block separately Order 1x X20BM12 bus module separately	Order 1x X20TB32 terminal block separately Order 1x X20BM32 bus module separately	Order 1x X20TB32 terminal block separately Order 1x X20BM32 bus module separately	Order 1x X20TB32 terminal block separately Order 1x X20BM12 bus module separately	Order 1x X20TB32 terminal block separately Order 1x X20BM12 bus module separately	Order 1x X20TB32 terminal block separately Order 1x X20BM12 bus module separately

¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

Digital mixed modules

X20DM9324



Short description

I/O module	8 digital inputs 24 VDC for 1-wire connections, 4 digital outputs 24 VDC for 1-wire connections
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General information

Nominal voltage	24 VDC
-----------------	--------

Power consumption

Bus	0.21 W
Internal I/O	0.5 W
External I/O	1.17 W

Certification

CE	Yes
cULus	Yes
cCSAus HazLoc Class 1 Division 2	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GOST-R	Yes

Digital inputs

Input filter	
Hardware	≤100 μs
Software	Default 1 ms, configurable between 0 and 25 ms in 0.2 ms intervals
Connection type	1-wire connections
Input circuit	Sink

Digital outputs

Design	FET positive switching
Nominal output current	0.5 A
Total nominal current	2 A
Connection type	1-wire connections
Output circuit	Source
Output protection	Thermal cutoff if overcurrent or short circuit occurs (see value "Peak short circuit current") Internal inverse diode for switching inductive loads (see section "Switching inductive loads")

Environmental conditions

Temperature	
Operation	
Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately
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¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Analog input modules

X20AI2222, X20AI4222, X20AI8221, X20AI2322, X20AI4322, X20AI8321



Short description	X20AI2222	X20AI4222	X20AI8221	X20AI2322	X20AI4322	X20AI8321
I/O module	2 analog inputs ±10 V	4 analog inputs ±10 V	8 analog inputs ±10 V	2 analog inputs 0 to 20 mA / 4 to 20 mA	4 analog inputs 0 to 20 mA / 4 to 20 mA	8 analog inputs 0 to 20 mA / 4 to 20 mA
General information	X20AI2222	X20AI4222	X20AI8221	X20AI2322	X20AI4322	X20AI8321
Power consumption						
Bus				0.01 W		
Internal I/O	0.8 W ¹⁾	1.1 W ¹⁾	1.04 W ¹⁾	0.8 W	1.1 W	1.37 W (Rev. ≥ D0), 1.24 W (Rev. < D0)
Certification						
CE				Yes		
cULus				Yes		
ATEX Zone 2 ²⁾				Yes		
GL				Yes		
LR				Yes		
GOST-R				Yes		
Analog inputs	X20AI2222	X20AI4222	X20AI8221	X20AI2322	X20AI4322	X20AI8321
Input	±10 V	±10 V	±10 V	0 to 20 mA/4 to 20 mA	0 to 20 mA/4 to 20 mA	0 to 20 mA/4 to 20 mA
Input type				Differential input		
Digital converter resolution	±12-bit	±12-bit	±12-bit	12-bit	12-bit	12-bit
Conversion time	300 µs for all inputs	400 µs for all inputs	1 ms for all inputs	300 µs for all inputs	400 µs for all inputs	1 ms for all inputs
Output format				INT		
Data type				INT		
Input impedance in signal range	20 MΩ	20 MΩ	20 MΩ	-	-	-
Load	-	-	-	<400 Ω	<400 Ω	<300 Ω
Input protection				Protection against wiring with supply voltage		
Open line detection	-	-	Yes, using software	-	-	-
Reverse polarity protection	-	-	Yes	-	-	Yes
Max. error at 25°C						
Gain	0.08% ³⁾	0.08% ³⁾	0.08% ³⁾	-	-	-
Offset	0.015% ⁴⁾	0.015% ⁴⁾	0.015% ⁴⁾	-	-	-
Gain						
0 to 20 mA	-	-	-	0.08% ³⁾	0.08% ³⁾	0.08% ³⁾
4 to 20 mA	-	-	-	0.1% ³⁾	0.1% ³⁾	0.1% ³⁾
Offset						
0 to 20 mA	-	-	-	0.03% ⁵⁾	0.03% ⁵⁾	0.03% ⁵⁾
4 to 20 mA	-	-	-	0.16% ⁵⁾	0.16% ⁵⁾	0.16% ⁵⁾
Environmental conditions	X20AI2222	X20AI4222	X20AI8221	X20AI2322	X20AI4322	X20AI8321
Temperature						
Operation						
Horizontal installation				-25 to 60°C		
Vertical installation				-25 to 50°C		

Analog input modules

X20AI2222, X20AI4222, X20AI8221, X20AI2322, X20AI4322, X20AI8321

Mechanical characteristics	X20AI2222	X20AI4222	X20AI8221	X20AI2322	X20AI4322	X20AI8321
Note	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module sepa- rately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module sepa- rately	Order 1x X20TB1F terminal block separately Order 1x X20BM11 bus module sepa- rately	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module sepa- rately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module sepa- rately	Order 1x X20TB1F terminal block separately Order 1x X20BM11 bus module sepa- rately

¹⁾ To reduce power dissipation, B&R recommends bridging unused inputs on the terminals.

²⁾ Ta min.: 0°C
Ta max.: See environmental conditions

³⁾ Based on the current measured value.

⁴⁾ Based on the 20 V measurement range.

⁵⁾ Based on the 20 mA measurement range.

X20AI2622, X20AI2632, X20AI2632-1, X20AI2636



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Short description	X20AI2622	X20AI2632	X20AI2632-1	X20AI2636
I/O module	2 analog inputs ± 10 V or 0 to 20 mA / 4 to 20 mA	2 analog inputs ± 10 V or 0 to 20 mA	2 analog inputs ± 11 V or 0 to 22 mA	2 analog inputs ± 10 V or 0 to 20 mA
General information	X20AI2622	X20AI2632	X20AI2632-1	X20AI2636
Power consumption				
Bus			0.01 W	
Internal I/O	0.8 W ¹⁾	1.2 W ¹⁾	1.2 W ¹⁾	1.2 W ²⁾
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2	Yes	Yes	-	-
ATEX Zone 2 ³⁾			Yes	
KC			Yes	
GL			Yes	
LR	Yes	Yes	-	Yes
GOST-R			Yes	
Analog inputs	X20AI2622	X20AI2632	X20AI2632-1	X20AI2636
Input	± 10 V or 0 to 20 mA / 4 to 20 mA, via different terminal connections	± 10 V or 0 to 20 mA, via different terminal connections	± 11 V or 0 to 22 mA, via different terminal connections	± 10 V or 0 to 20 mA, via different terminal connections
Input type			Differential input	
Digital converter resolution				
Voltage	± 12 -bit	± 15 -bit	± 15 -bit	± 15 -bit
Current	12-bit	15-bit	15-bit	15-bit
Conversion time	300 μ s for all inputs	50 μ s for all inputs	50 μ s for all inputs	40 μ s for all inputs
Output format			INT	
Input impedance in signal range				
Voltage			20 M Ω	
Current			-	
Load				
Voltage			-	
Current			<400 Ω	
Input protection			Protection against wiring with supply voltage	
Max. error at 25°C				
Voltage				
Gain			0.08% ⁴⁾	
Offset	0.015% ⁵⁾	0.01% ⁵⁾	0.01% ⁶⁾	0.01% ⁵⁾
Current				
Gain	0 to 20 mA = 0.08% / 4 to 20 mA = 0.1% ⁴⁾	0.08% ⁴⁾	0.08% ⁴⁾	0.08% ⁴⁾
Offset	0 to 20 mA = 0.03% / 4 to 20 mA = 0.16% ⁷⁾	0.02% ⁷⁾	0.02% ⁸⁾	0.02% ⁷⁾
Environmental conditions	X20AI2622	X20AI2632	X20AI2632-1	X20AI2636
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	

Analog input modules

X20AI2622, X20AI2632, X20AI2632-1, X20AI2636

Mechanical characteristics	X20AI2622	X20AI2632	X20AI2632-1	X20AI2636
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Note

Order 1x X20TB06 or X20TB12 terminal block separately
Order 1x X20BM11 bus module separately

- ¹⁾ To reduce power dissipation, B&R recommends bridging unused inputs on the terminals or configuring them as current signals.
- ²⁾ To reduce power dissipation, B&R recommends bridging unused inputs on the terminals.
- ³⁾ Ta min.: 0°C
Ta max.: See environmental conditions
- ⁴⁾ Based on the current measured value.
- ⁵⁾ Based on the 20 V measurement range.
- ⁶⁾ Based on the 22 V measurement range.
- ⁷⁾ Based on the 20 mA measurement range.
- ⁸⁾ Based on the 22 mA measurement range.

X20AI4622, X20AI4632, X20AI4632-1, X20AI4636



Short description	X20AI4622	X20AI4632	X20AI4632-1	X20AI4636
I/O module	4 analog inputs ± 10 V or 0 to 20 mA / 4 to 20 mA	4 analog inputs ± 10 V or 0 to 20 mA	4 analog inputs ± 11 V or 0 to 22 mA	4 analog inputs ± 10 V or 0 to 20 mA
General information	X20AI4622	X20AI4632	X20AI4632-1	X20AI4636
Power consumption				
Bus			0.01 W	
Internal I/O	1.1 W ¹⁾	1.5 W ¹⁾	1.5 W ¹⁾	1.5 W ²⁾
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2	Yes	Yes	-	-
ATEX Zone 2 ³⁾			Yes	
KC			Yes	
GL			Yes	
LR	-	Yes	-	Yes
GOST-R			Yes	
Analog inputs	X20AI4622	X20AI4632	X20AI4632-1	X20AI4636
Input	± 10 V or 0 to 20 mA / 4 to 20 mA, via different terminal connections	± 10 V or 0 to 20 mA, via different terminal connections	± 11 V or 0 to 22 mA, via different terminal connections	± 10 V or 0 to 20 mA, via different terminal connections
Input type	Differential input			
Digital converter resolution				
Voltage	± 12 -bit	± 15 -bit	± 15 -bit	± 15 -bit
Current	12-bit	15-bit	15-bit	15-bit
Conversion time	400 μ s for all inputs	50 μ s for all inputs	50 μ s for all inputs	40 μ s for all inputs
Output format	INT			
Input impedance in signal range				
Voltage			20 M Ω	
Current			-	
Load				
Voltage			-	
Current			<400 Ω	
Input protection	Protection against wiring with supply voltage			
Max. error at 25°C				
Voltage				
Gain			0.08% ⁴⁾	
Offset	0.015% ⁵⁾	0.01% ⁵⁾	0.01% ⁶⁾	0.01% ⁵⁾
Current				
Gain	0 to 20 mA = 0.08% / 4 to 20 mA = 0.1% ⁴⁾	0.08% ⁴⁾	0.08% ⁴⁾	0.08% ⁴⁾
Offset	0 to 20 mA = 0.03% / 4 to 20 mA = 0.16% ⁷⁾	0.02% ⁷⁾	0.02% ⁸⁾	0.02% ⁷⁾
Environmental conditions	X20AI4622	X20AI4632	X20AI4632-1	X20AI4636
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	

Analog input modules

X20AI4622, X20AI4632, X20AI4632-1, X20AI4636

Mechanical characteristics	X20AI4622	X20AI4632	X20AI4632-1	X20AI4636
Note			Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	
¹⁾ To reduce power dissipation, B&R recommends bridging unused inputs on the terminals or configuring them as current signals.				
²⁾ To reduce power dissipation, B&R recommends bridging unused inputs on the terminals.				
³⁾ Ta min.: 0°C Ta max.: See environmental conditions				
⁴⁾ Based on the current measured value.				
⁵⁾ Based on the 20 V measurement range.				
⁶⁾ Based on the 22 V measurement range.				
⁷⁾ Based on the 20 mA measurement range.				
⁸⁾ Based on the 22 mA measurement range.				

X20AI2237, X20AI2437, X20AI2438



Short description	X20AI2237	X20AI2437	X20AI2438
I/O module	2 analog inputs ± 10 V	2 analog inputs 4 to 20 mA or 0 to 25 mA	2 analog inputs 4 to 20 mA or 0 to 25 mA
General information	X20AI2237	X20AI2437	X20AI2438
Power consumption			
Bus		0.05 W	
Internal I/O	1.15 W ¹⁾	1.15 W ²⁾	1.15 W ²⁾
External I/O		1.5 W ³⁾	
Certification			
CE		Yes	
cULus		Yes	
ATEX Zone 2 ⁴⁾		Yes	
KC	-	Yes	Yes
GL	-	Yes	Yes
LR	-	Yes	Yes
GOST-R		Yes	
Analog inputs	X20AI2237	X20AI2437	X20AI2438
Input	± 10 V	4 to 20 mA or 0 to 25 mA, configurable using software	4 to 20 mA or 0 to 25 mA, configurable using software
Input type		Differential input	
Digital converter resolution	± 15 -bit	15-bit	15-bit
Data output rate	10,000 samples per second	4.7 to 960 samples per second, configurable using software	-
Data output rate			
With HART	-	-	4.7 to 10 samples per second, configurable using software
Analog	-	-	4.7 to 100 samples per second, configurable using software
Output format		INT	
Input impedance in signal range	20 M Ω	-	-
Load	-	<300 Ω	<300 Ω
Input protection	Up to 30 VDC, reverse polarity protection	Up to 30 VDC, reverse polarity protection (max. 0.1 A)	Up to 30 VDC, reverse polarity protection (max. 0.1 A)
Open line detection		Yes, using software	
Max. error at 25°C			
Gain	0.013% ⁵⁾	-	-
Offset	0.0035% ⁶⁾	-	-
Gain			
0 to 25 mA	-	<0.046% ⁵⁾	<0.046% ⁵⁾
4 to 20 mA	-	<0.046% ⁵⁾	<0.046% ⁵⁾
Offset			
0 to 25 mA	-	<0.004% ⁷⁾	<0.004% ⁷⁾
4 to 20 mA	-	<0.013% ⁷⁾	<0.013% ⁷⁾
Sensor supply	X20AI2237	X20AI2437	X20AI2438
Nominal voltage		25 V $\pm 2\%$	
Nominal output current		Max. 30 mA	

Analog input modules

X20AI2237, X20AI2437, X20AI2438

HART	X20AI2237	X20AI2437	X20AI2438
Transfer rate	-	-	1200 bit/s
Operating frequencies	-	-	1200 Hz / 2200 Hz
Multi-drop operation			
Possible	-	-	Yes
Stations	-	-	5
Burst operation possible	-	-	Yes
Environmental conditions	X20AI2237	X20AI2437	X20AI2438
Temperature			
Operation			
Horizontal installation		-25 to 60°C	
Vertical installation		-25 to 50°C	
Mechanical characteristics	X20AI2237	X20AI2437	X20AI2438
Note		Order 1x X20TB12 terminal block separately	Order 1x X20BM11 bus module separately

¹⁾ To reduce power dissipation, B&R recommends bridging unused inputs.

²⁾ To reduce power dissipation, B&R recommends leaving unused inputs open.

³⁾ Sensor supply

⁴⁾ Ta min.: 0°C
Ta max.: See environmental conditions

⁵⁾ Based on the current measured value.

⁶⁾ Based on the 20 V measurement range.

⁷⁾ Based on the 25 mA measurement range.

X20AI1744, X20AI1744-3



Short description	X20AI1744	X20AI1744-3
I/O module		1 full-bridge strain gauge input
General information	X20AI1744	X20AI1744-3
Power consumption		
Bus		0.01 W
Internal I/O		1.25 W
Certification		
CE		Yes
cULus		Yes
ATEX Zone 2 ¹⁾		Yes
KC		Yes
GOST-R		Yes
Full-bridge strain gauge	X20AI1744	X20AI1744-3
Strain gauge factor		2 to 256 mV/V, configurable using software
Connection		4- or 6-wire connections ²⁾
Input type		Differential, used to evaluate a full-bridge strain gauge
Digital converter resolution		24-bit
Conversion time		Depends on the configured data output rate
Data output rate		2.5 - 7500 samples per second, configurable using software (f _{DATA})
Input filter		
Cutoff frequency	5 kHz	5 Hz
Order		3
Slope		60 dB
ADC filter characteristics		Sigma-delta, see section "Filter characteristics of the sigma-delta ADC"
Operating range / Measurement sensor		85 to 5000 Ω
Input protection		RC protection
Strain gauge supply		
Voltage		5.5 VDC / max. 65 mA ³⁾
Short circuit protection, overload protection		Yes
Environmental conditions	X20AI1744	X20AI1744-3
Temperature		
Operation		
Horizontal installation		0 to 55°C
Vertical installation		0 to 50°C
Mechanical characteristics	X20AI1744	X20AI1744-3
Note		Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ With 6-wire connections, line compensation does not function. (See section "Connection examples")

³⁾ The maximum current of 90 mA is permitted up to an operating temperature of 45°C.

Analog input modules

X20AIA744, X20AIB744



Short description	X20AIA744	X20AIB744
I/O module	2 full-bridge strain gauge inputs	4 full-bridge strain gauge inputs
General information	X20AIA744	X20AIB744
Power consumption		
Bus		0.01 W
Internal I/O	0.7 W	1 W
Certification		
CE		Yes
GOST-R		Yes
Full-bridge strain gauge	X20AIA744	X20AIB744
Strain gauge factor	2 to 256 mV/V, configurable using software	
Connection	4-wire connections	
Input type	Differential, used to evaluate a full-bridge strain gauge	
Digital converter resolution	24-bit	
Conversion time	200 μ s	
Data output rate	5000 samples per second and per channel (f_{DATA})	
Input filter		
Cutoff frequency		2.5 kHz
Order		3
Slope		60 dB
ADC filter characteristics	Sigma-delta, see section "Filter"	
Operating range / Measurement sensor	85 to 5000 Ω	
Input protection	RC protection	
Strain gauge supply		
Voltage	5.5 VDC / max. 65 mA per channel	
Short circuit protection, overload protection	Yes	
Environmental conditions	X20AIA744	X20AIB744
Temperature		
Operation		
Horizontal installation		-25 to 60°C
Vertical installation		-25 to 50°C
Mechanical characteristics	X20AIA744	X20AIB744
Note	Order 1x X20TB1F terminal block separately Order 1x X20BM11 bus module separately	

X20AP3111, X20AP3121, X20AP3131, X20AP3122, X20AP3132



Short description	X20AP3111	X20AP3121	X20AP3131	X20AP3122	X20AP3132
I/O module	3-phase power and energy metering module for current/ current transformers	3-phase power and energy metering module for current/ current transformers	3-phase power and energy metering module for current/ current transformers	3-phase power and energy metering module for current/ current transformers, can be grounded on one side	3-phase power and energy metering module for current/ current transformers, can be grounded on one side
General information	X20AP3111	X20AP3121	X20AP3131	X20AP3122	X20AP3132
Power consumption					
Bus	0.85 W	0.85 W	0.85 W	TBD	TBD
Internal I/O			-		
Additional module power dissipation [W]	40 mW ¹⁾	2 W ¹⁾	2 W ¹⁾	2 W ¹⁾	2 W ¹⁾
Certification					
CE			Yes		
cULus	Yes	Yes	Yes	-	-
ATEX Zone 2 ²⁾	Yes	Yes	Yes	-	-
GOST-R			Yes		
Voltage inputs	X20AP3111	X20AP3121	X20AP3131	X20AP3122	X20AP3132
Number of phases			3		
Nominal voltage					
Between phases			Max. 480 VAC		
Phase to N			Max. 277 VAC		
Max. overload voltage			1.25 x U _N for 10 min 2 x U _N for 1 min		
Resolution			10 mV, with voltage connected directly		
Nominal frequency			50 and 60 Hz		
Current inputs	X20AP3111	X20AP3121	X20AP3131	X20AP3122	X20AP3132
Quantity			4 AC inputs		
Nominal current					
Secondary	20 mA	1 A	5 A	1 A	5 A
Primary		65 A directly configurable, larger values through conversion in the application ³⁾			
Max. overload current	20 x I _N for 0.5 s	8 x I _N for 0.5 s	8 x I _N for 0.5 s	8 x I _N for 0.5 s	8 x I _N for 0.5 s
Max. measurement current	20 mA	1 A	5 A	1 A	5 A
Resolution			1 mA, based on the primary current ³⁾		
Load	25 Ω	500 mΩ	20 mΩ	500 mΩ	20 mΩ
Measurement precision	X20AP3111	X20AP3121	X20AP3131	X20AP3122	X20AP3132
U _{RMS} and I _{RMS}			<0.5%		
Effective, reactive and apparent power			<0.5% on average		
Frequency, power factor and phase angle			<0.5% ⁴⁾		
Calibration accuracy			<0.15%		
Environmental conditions	X20AP3111	X20AP3121	X20AP3131	X20AP3122	X20AP3132
Temperature					
Operation					
Horizontal installation			-25 to 60°C		
Vertical installation			-25 to 50°C		
Mechanical characteristics	X20AP3111	X20AP3121	X20AP3131	X20AP3122	X20AP3132
Note			Order 1x X20TB32 terminal block separately Order 1x X20BM32 bus module separately		

¹⁾ Power dissipation of current measurement shunts.

²⁾ Ta min.: 0°C
Ta max.: See environmental conditions

³⁾ For measuring higher current values, see section "Current transformer - Pinout".

⁴⁾ From 0.151 VAC to 480 VAC

Analog input modules

X20AP3161, X20AP3171



Short description	X20AP3161	X20AP3171
I/O module	3-phase power and energy metering module for current/voltage transformers	3-phase power and energy metering module for Rogowski current transformers
General information	X20AP3161	X20AP3171
Power consumption		
Bus	0.85 W	TBD
Internal I/O		-
Additional module power dissipation [W]		- ¹⁾
Certification		
CE		Yes
cULus	Yes	-
ATEX Zone 2 ²⁾	Yes	-
GOST-R		Yes
Voltage inputs	X20AP3161	X20AP3171
Number of phases		3
Nominal voltage		
Between phases		Max. 480 VAC
Phase to N		Max. 277 VAC
Max. overload voltage		1.25 x U _N for 10 min 2 x U _N for 1 min
Resolution		10 mV, with voltage connected directly
Nominal frequency		50 and 60 Hz
Current inputs	X20AP3161	X20AP3171
Quantity		4 AC inputs
Nominal current		
Secondary	333 mV	Max. 720 mV, configurable as mV/A
Primary		65 A directly configurable, larger values through conversion in the application ³⁾
Max. overload current		-
Max. measurement current	333 mV	720 mV
Resolution		1 mA, based on the primary current ³⁾
Load		-
Measurement precision	X20AP3161	X20AP3171
U _{RMS} and I _{RMS}		<0.5%
Effective, reactive and apparent power		<0.5% on average
Frequency, power factor and phase angle		<0.5% ⁴⁾
Calibration accuracy	<0.15%	TBD
Environmental conditions	X20AP3161	X20AP3171
Temperature		
Operation		
Horizontal installation		-25 to 60°C
Vertical installation		-25 to 50°C
Mechanical characteristics	X20AP3161	X20AP3171
Note		Order 1x X20TB32 terminal block separately Order 1x X20BM32 bus module separately

¹⁾ Shunts are external current transformers

²⁾ Ta min.: 0°C
Ta max.: See environmental conditions

³⁾ For measuring higher current values, see section "Current transformer - Pinout".

⁴⁾ From 0.151 VAC to 480 VAC

Analog output modules

X20AO2622, X20AO4622



Short description	X20AO2622	X20AO4622
I/O module	2 analog outputs ± 10 V or 0 to 20 mA / 4 to 20 mA ¹⁾	4 analog outputs ± 10 V or 0 to 20 mA / 4 to 20 mA ¹⁾
General information	X20AO2622	X20AO4622
Power consumption		
Bus		0.01 W
Internal I/O	1.1 W	1.8 W (Rev. \geq J0), 2.2 W (Rev. < J0)
Certification		
CE		Yes
cULus		Yes
cCSAus HazLoc Class 1 Division 2		Yes
ATEX Zone 2 ²⁾		Yes
KC		Yes
GL		Yes
LR		Yes
GOST-R		Yes
Analog outputs	X20AO2622	X20AO4622
Output	± 10 V or 0 to 20 mA / 4 to 20 mA, via different terminal connections ¹⁾	
Digital converter resolution		
Voltage		± 12 -bit
Current		12-bit
Conversion time	200 μ s for all outputs	300 μ s for all outputs
Power on/off behavior		Internal enable relay for booting
Max. error at 25°C		
Voltage		
Gain	0.15% ³⁾	0.08% ³⁾
Offset		0.05% ⁴⁾
Current		
Gain	0.15% ³⁾	0.09% ³⁾
Offset		0.05% ⁴⁾
Output protection		Short circuit protection
Environmental conditions	X20AO2622	X20AO4622
Temperature		
Operation		
Horizontal installation	-25 to 60°C	-25 to 60°C (Rev. \geq J0); 0 to 55°C (Rev. < J0)
Vertical installation	-25 to 50°C	-25 to 50°C (Rev. \geq J0); 0 to 50°C (Rev. < J0)
Mechanical characteristics	X20AO2622	X20AO4622
Note	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately

¹⁾ 4 to 20 mA: From upgrade version 1.0.2.0 or hardware revision "I0"

²⁾ Ta min.: 0°C
Ta max.: See environmental conditions

³⁾ Based on the current output value.

⁴⁾ Based on the entire output range.

Analog output modules

X20AO2632, X20AO2632-1, X20AO4632, X20AO4632-1, X20AO4635



Short description	X20AO2632	X20AO2632-1	X20AO4632	X20AO4632-1	X20AO4635
I/O module	2 analog outputs ±10 V or 0 to 20 mA	2 analog outputs ±11 V or 0 to 22 mA	4 analog outputs ±10 V or 0 to 20 mA	4 analog outputs ±11 V or 0 to 22 mA	4 analog outputs, ±10 V or 0 to 20 mA, low temperature drift
General information	X20AO2632	X20AO2632-1	X20AO4632	X20AO4632-1	X20AO4635
Power consumption					
Bus			0.01 W		
Internal I/O	1.1 W	1.25 W	1.8 W (Rev. ≥ J0), 2.2 W (Rev. < J0)	2.15 W	1.5 W
Certification					
CE			Yes		
cULus			Yes		
cCSAus HazLoc Class 1 Division 2	Yes	-	Yes	-	Yes
ATEX Zone 2 ¹⁾			Yes		
KC			Yes		
GL			Yes		
LR			Yes		
GOST-R			Yes		
Analog outputs	X20AO2632	X20AO2632-1	X20AO4632	X20AO4632-1	X20AO4635
Output	±10 V or 0 to 20 mA, via different terminal connections	±11 V or 0 to 22 mA, via different terminal connections	±10 V or 0 to 20 mA, via different terminal connections	±11 V or 0 to 22 mA, via different terminal connections	±10 V or 0 to 20 mA, via different terminal connections
Digital converter resolution					
Voltage			±15-bit		
Current			15-bit		
Conversion time					
			50 µs for all outputs		
Power on/off behavior					
			Internal enable relay for booting		
Max. error at 25°C					
Gain	-	-	-	-	0.04% ²⁾
Offset	-	-	-	-	0.022% ³⁾
Voltage					
Gain	0.045% ²⁾	0.05% ²⁾	0.04% ²⁾	0.05% ²⁾	-
Offset	0.025% ³⁾	0.015% ³⁾	0.022% ³⁾	0.015% ³⁾	-
Current					
Gain	0.09% ²⁾	0.08% ²⁾	0.09% ²⁾	0.08% ²⁾	-
Offset	0.045% ³⁾	0.05% ³⁾	0.045% ³⁾	0.05% ³⁾	-
Output protection					
			Short circuit protection		
Environmental conditions	X20AO2632	X20AO2632-1	X20AO4632	X20AO4632-1	X20AO4635
Temperature					
Operation					
Horizontal installation	-25 to 60°C	-25 to 60°C	-25 to 60°C (Rev. ≥ J0); 0 to 55°C (Rev. < J0)	-25 to 60°C	-25 to 55°C
Vertical installation	-25 to 50°C	-25 to 50°C	-25 to 50°C (Rev. ≥ J0); 0 to 50°C (Rev. < J0)	-25 to 50°C	-25 to 50°C

X20AO2632, X20AO2632-1, X20AO4632, X20AO4632-1, X20AO4635

Mechanical characteristics	X20AO2632	X20AO2632-1	X20AO4632	X20AO4632-1	X20AO4635
Note	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Based on the current output value.

³⁾ Based on the entire output range.

Analog output modules

X20AO2437, X20AO2438



Short description	X20AO2437	X20AO2438
I/O module		2 analog outputs 4 to 20 mA, 0 to 20 mA or 0 to 24 mA
General information	X20AO2437	X20AO2438
Power consumption		
Bus		0.05 W
Internal I/O	1.6 W	1.65 W
Certification		
CE		Yes
cULus		Yes
ATEX Zone 2 ¹⁾		Yes
KC		Yes
GL		Yes
LR		Yes
GOST-R		Yes
Analog outputs	X20AO2437	X20AO2438
Output		4 to 20 mA, 0 to 20 mA or 0 to 24 mA, configurable using software
Digital converter resolution		16-bit
Data output rate	1 ms without ramp	-
Data output rate		
With HART	-	210 ms (default)
Analog	-	1 ms without ramp
Max. error at 25°C		
Gain		
4 to 20 mA		0.025% ²⁾
0 to 20 mA		0.022% ²⁾
0 to 24 mA		0.02% ²⁾
Offset		
4 to 20 mA		0.025% ³⁾
0 to 20 mA		0.022% ³⁾
0 to 24 mA		0.02% ³⁾
Output protection		Short circuit protection, overvoltage protection (up to 30 VDC)
Open line detection		Yes, using hardware and software
HART	X20AO2437	X20AO2438
Transfer rate	-	1200 bit/s
Operating frequencies	-	1200 Hz / 2200 Hz
Burst operation possible	-	Yes
Multi-drop operation		
Possible	-	Yes
Stations	-	Up to 15
Environmental conditions	X20AO2437	X20AO2438
Temperature		
Operation		
Horizontal installation		-25 to 60°C
Vertical installation		-25 to 50°C
Mechanical characteristics	X20AO2437	X20AO2438
Note		Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Based on the current output value.

³⁾ Based on the respective output range

Temperature modules

X20AT2222, X20AT2311, X20AT4222, X20ATA312, X20ATB312



Short description	X20AT2222	X20AT2311	X20AT4222	X20ATA312	X20ATB312
I/O module	2 inputs for PT100 or PT1000 resistance temperature measurement	2 inputs for PT100 resistance temperature measurement	4 inputs for PT100 or PT1000 resistance temperature measurement	2 inputs for PT100 resistance temperature measurement	4 inputs for PT100 resistance temperature measurement
General information	X20AT2222	X20AT2311	X20AT4222	X20ATA312	X20ATB312
Power consumption					
Bus	0.01 W	0.35 W	0.01 W	0.01 W	0.01 W
Internal I/O	1.1 W	0.85 W	1.1 W	0.4 W	0.6 W
Certification					
CE			Yes		
cULus			Yes		
cCSAus HazLoc Class 1 Division 2	Yes	Yes	Yes	-	-
ATEX Zone 2 ¹⁾			Yes		
KC	Yes	Yes	Yes	-	-
GL	Yes	-	Yes	-	-
LR	Yes	-	Yes	-	-
GOST-R	Yes	Yes	Yes	-	-
Temperature inputs resistance measurement	X20AT2222	X20AT2311	X20AT4222	X20ATA312	X20ATB312
Input	Resistance measurement with constant current supply for 2- or 3-wire connections	Resistance measurement with constant current supply for 4-wire connections	Resistance measurement with constant current supply for 2- or 3-wire connections	Resistance measurement with constant current supply for 4-wire connections	Resistance measurement with constant current supply for 4-wire connections
Digital converter resolution	16-bit	24-bit	16-bit	24-bit	24-bit
Filter time	Configurable between 1 ms and 66.7 ms	Configurable between 1 ms and 400 ms	Configurable between 1 ms and 66.7 ms	1 to 200 ms	1 to 200 ms
Conversion time					
1 channel	20 ms with 50 Hz filter	-	20 ms with 50 Hz filter	20 ms with 50 Hz filter	20 ms with 50 Hz filter
1000 Hz filter	-	1 ms for all inputs	-	-	-
2 - 4 channels	-	-	40 ms per channel with 50 Hz filter	-	-
2 channels	80 ms with 50 Hz filter	-	-	40 ms per channel with 50 Hz filter	40 ms per channel with 50 Hz filter ⁴⁾
50 Hz filter	-	20 ms for all inputs	-	-	-
Output format	INT or UINT for resistance measurement	DINT or UDINT for resistance measurement	INT or UINT for resistance measurement	DINT or UDINT for resistance measurement	DINT or UDINT for resistance measurement
Sensor					
Sensor type	Configurable per channel	-	Configurable per channel	-	-
PT100	-200 to 850°C	-	-200 to 850°C	-	-
PT1000	-200 to 850°C	-	-200 to 850°C	-	-
Resistance measurement range	0.1 to 4500 Ω / 0.05 to 2250 Ω	0.5 to 390 Ω	0.1 to 4500 Ω / 0.05 to 2250 Ω	0.5 to 390 Ω	0.5 to 390 Ω
Temperature measurement range	-	-200 to 850°C	-	-200 to 850°C	-200 to 850°C
Max. error at 25°C					
Gain	0.037% ²⁾	0.0059% ²⁾	0.037% ²⁾	0.0059% ²⁾	0.0059% ²⁾
Offset			0.0015% ³⁾		

Temperature modules

X20AT2222, X20AT2311, X20AT4222, X20ATA312, X20ATB312

Environmental conditions	X20AT2222	X20AT2311	X20AT4222	X20ATA312	X20ATB312
Temperature					
Operation					
Horizontal installation			-25 to 60°C		
Vertical installation			-25 to 50°C		
Mechanical characteristics	X20AT2222	X20AT2311	X20AT4222	X20ATA312	X20ATB312
Note	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 or X20TB1F terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 or X20TB1F terminal block separately Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

²⁾ Based on the current resistance value.

³⁾ Based on the entire resistance measurement range.

⁴⁾ The module is equipped with two independent converters (sensor 1 and 2, sensor 3 and 4). The conversion time is based on the number of channels connected to the respective converter.

X20AT2402, X20AT6402, X20ATA492, X20ATC402



Short description	X20AT2402	X20AT6402	X20ATA492	X20ATC402
I/O module	2 inputs for thermocouples	6 inputs for thermocouples	2 inputs for thermocouples	6 inputs for thermocouples
General information	X20AT2402	X20AT6402	X20ATA492	X20ATC402
Power consumption				
Bus	0.01 W	0.01 W	0.35 W	0.01 W
Internal I/O	0.72 W	0.91 W	0.5 W	0.85 W
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2	Yes	Yes	-	-
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL	Yes	Yes	-	-
LR	Yes	Yes	-	-
GOST-R			Yes	
Thermocouple temperature inputs	X20AT2402	X20AT6402	X20ATA492	X20ATC402
Input	Thermocouple			
Digital converter resolution	16-bit			
Filter time	Configurable between 1 ms and 66.7 ms	Configurable between 1 ms and 66.7 ms	Configurable between 1 ms and 66.7 ms	Configurable between 1 and 200 ms
Conversion time				
1 channel	80.4 ms with 50 Hz filter	80.4 ms with 50 Hz filter	-	-
2 channels	120.6 ms with 50 Hz filter	-	-	-
n channels	-	(n + 1) x 40.2 ms at 50 Hz filter	-	-
Internal terminal temperature comp.				
n channels	-	-	-	(n + 2) * 4 * x ms ²⁾
Internal terminal temperature comp.	-	-	2 * 4 * x ms ²⁾	-
External terminal temperature comp.				
1 channel	-	-	-	x ms ²⁾
n channels	-	-	-	n * 4 * x ms ²⁾
External terminal temperature comp.	-	-	x ms ²⁾	-
Remote temperature comp.	-	-	2 * 4 * x ms ²⁾	-
Remote temperature comp.				
n channels	-	-	-	(n + 2) * 4 * x ms ²⁾
Output format	INT			
Measurement range				
Sensor temperature				
Type J: Fe-CuNi			-210 to 1200°C	
Type K: NiCr-Ni			-270 to 1372°C	
Type N: NiCrSi-NiSi	-270 to 1300°C (Rev. ≥D0)	-270 to 1300°C (Rev. ≥D0)	-270 to 1298°C	-270 to 1298°C
Type S: PtRh10-Pt			-50 to 1768°C	
Type B: PtRh30-PtRh6			0 to 1820°C	
Type R: PtRh13-Pt	-50 to 1664°C	-50 to 1664°C	-50 to 1760°C	-50 to 1760°C
Type E: NiCr-CuNi	-	-	-270 to 997°C	-270 to 997°C
Type C: WRe5-WRe26	-	-	0 to 2310°C	0 to 2310°C
Type T: Cu-CuNi	-	-	-270 to 400°C	-270 to 400°C
Terminal temperature	-25 to 85°C	-25 to 85°C	-40 to 130°C	-40 to 130°C
Raw value	±65.534 mV	±65.534 mV	-	-
Voltage	-	-	±65.534 mV	±65.534 mV

Temperature modules

X20AT2402, X20AT6402, X20ATA492, X20ATC402

Terminal temperature compensation	Internal	Internal	-	-
Terminal temperature compensation				
Operating modes	-	-	Internal/remote or external	Internal/remote or external
Environmental conditions	X20AT2402	X20AT6402	X20ATA492	X20ATC402
Temperature				
Operation				
Horizontal installation	0 to 55°C	0 to 55°C	-25 to 60°C	-25 to 60°C
Vertical installation	0 to 50°C	0 to 50°C	-25 to 50°C	-25 to 50°C
Mechanical characteristics	X20AT2402	X20AT6402	X20ATA492	X20ATC402
Note	Order 1x X20TB06 or X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB1E terminal block for internal/remote terminal temperature compensation separately Order 1x X20TB1F terminal block for external terminal temperature compensation separately Order 1x X20BM11 bus module separately	Order 1x X20TB1E terminal block for internal/remote terminal temperature compensation separately Order 1x X20TB1F terminal block for external terminal temperature compensation separately Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ With a 50 Hz filter, x = 20 ms (1 / 50 Hz = 20 ms)

Motor modules

X20MM3332, X20MM4331, X20MM2436, X20MM4456



Short description	X20MM3332	X20MM4331	X20MM2436	X20MM4456
I/O module	3 full-bridge outputs	4 half-bridge outputs	2-channel PWM motor bridge, 2 AB incremental encoders	4-channel PWM motor bridge, 4 AB incremental encoders
General information	X20MM3332	X20MM4331	X20MM2436	X20MM4456
Power consumption				
Bus			0.01 W	
Internal I/O	0.8 W	0.8 W	-	2.4 W
External I/O				
24 VDC	-	-	2.45 W	-
48 VDC	-	-	3.15 W	-
External I/O 50 kHz				
24 VDC	-	-	-	3.3 W / channel
48 VDC	-	-	-	4.7 W / channel
60 VDC	-	-	-	5.4 W / channel
External I/O 10 kHz				
24 VDC	-	-	-	2.1 W / channel
48 VDC	-	-	-	2.4 W / channel
60 VDC	-	-	-	2.6 W / channel
External I/O 5 kHz				
24 VDC	-	-	-	2 W / channel
48 VDC	-	-	-	2.1 W / channel
60 VDC	-	-	-	2.2 W / channel
Certification				
CE			Yes	
cULus	Yes	Yes	-	-
cULus	-	-	Yes	Yes
ATEX Zone 2 ¹⁾	Yes	Yes	Yes	-
KC			Yes	
GOST-R			Yes	
Motor bridge - Power unit	X20MM3332	X20MM4331	X20MM2436	X20MM4456
Quantity	3	4	-	-
Design	H bridge	-	-	-
Type	Full bridge High-side driver Low-side driver	Half bridge High-side driver Low-side driver	-	-
Nominal voltage	24 VDC	24 VDC	-	-
Nominal current	3 A	3 A	-	-
Maximum current	5 A (250 ms)	5 A (250 ms)	-	-
Total nominal current	10 A	10 A	-	-
Current value measurement				
Resolution	100 mA	100 mA	-	-
Data collection	In the driver	On the high-side branch	-	-

Motor modules

X20MM3332, X20MM4331, X20MM2436, X20MM4456

Output protection	Thermal cutoff for overcurrent and short circuit	Thermal cutoff for overcurrent and short circuit	-	-
Supply voltage	No reverse polarity protection	No reverse polarity protection	-	-
Digital inputs	X20MM3332	X20MM4331	X20MM2436	X20MM4456
Quantity	-	-	4	16
Nominal voltage	-	-	24 VDC	24 VDC
Input filter				
Hardware	-	-	<5 µs	<5 µs
Software	-	-	-	-
Connection type	-	-	1-wire connections	1-wire connections
Input circuit	-	-	Sink	Sink
Additional functions	-	-	2x AB incremental encoder, 1x ABR counter, 2x event counter, 2x period duration/gate measurement	4x ABR incremental encoder
AB incremental encoder	X20MM3332	X20MM4331	X20MM2436	X20MM4456
Quantity	-	-	2	-
Encoder inputs	-	-	24 V, asymmetrical	-
Counter size	-	-	16-bit	-
Input frequency	-	-	Max. 50 kHz	-
Evaluation	-	-	4x	-
ABR incremental encoder	X20MM3332	X20MM4331	X20MM2436	X20MM4456
Quantity	-	-	-	4
Encoder inputs	-	-	-	24 V, asymmetrical
Counter size	-	-	-	16-bit
Input frequency	-	-	-	Max. 50 kHz
Evaluation	-	-	-	4x
Digital outputs	X20MM3332	X20MM4331	X20MM2436	X20MM4456
Quantity	-	4	-	-
Nominal voltage	-	24 VDC	-	-
Output protection	-	Thermal cutoff for overcurrent and short circuit	-	-
Type	-	Half bridge High-side driver (Source) Low-side driver (Sink)	-	-
Max. continuous current per output	-	3 A	-	-
Max. module current	-	10 A	-	-
Recording the current value on the high branch				
Resolution	-	100 mA	-	-
PWM output	X20MM3332	X20MM4331	X20MM2436	X20MM4456
Quantity	-	-	2	4
Nominal voltage	-	-	24 to 39 VDC ±25%	24 to 48 VDC ±25%
Nominal current	-	-	3 A	6 A
Maximum current	-	-	3.5 A (2 s)	10 A (2 s)
PWM frequency	-	-	-	15 Hz to 50 kHz
PWM frequency				
Standard operating mode (PWM/ current)	-	-	15 Hz to 50 kHz	-
Frequency operating mode	-	-	1 Hz to 6553.5 Hz	-
Actuator supply				
Supply	-	-	External	External
Fuse	-	-	Required line fuse: Max. 10 A, slow-blow	Required line fuse: Max. 32 A slow-blow (see "Overcurrent protection")

X20MM3332, X20MM4331, X20MM2436, X20MM4456

Output protection	-	-	Thermal cutoff for overcurrent and short circuit	Thermal cutoff for overcurrent and short circuit
Period duration resolution (PWM/ current operating mode)	-	-	16-bit, min. 20 µs	-
Frequency resolution (frequency operating mode)				
0.1 Hz scaling	-	-	<3000 Hz: 0.1 Hz; 3000 to 6553.5 Hz: 0.1 to 0.4 Hz	-
0.01 Hz scaling	-	-	<300 Hz: 0.01 Hz; 300 to 655.35 Hz: 0.01 to 0.04 Hz	-
Frequency mode	-	-	15-bit + sign ≥10 ns	-
Environmental conditions	X20MM3332	X20MM4331	X20MM2436	X20MM4456
Temperature				
Operation				
Horizontal installation			0 to 50°C	
Vertical installation			Not permitted	
Mechanical characteristics	X20MM3332	X20MM4331	X20MM2436	X20MM4456
Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM31 bus module separately	Order 2x X20TB12 terminal block separately Order 1x 0TB3103-7020 terminal block separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Motor modules

X20SM1426, X20SM1436



Short description	X20SM1426	X20SM1436
I/O module		1 full bridge for controlling stepper motors
General information	X20SM1426	X20SM1436
Power consumption		
Bus		0.01 W
Internal I/O	1.8 W	-
External I/O		
24 VDC	-	2.45 W
48 VDC	-	3.15 W
Certification		
CE		Yes
cULus		Yes
ATEX Zone 2 ¹⁾		Yes
KC		Yes
GOST-R		Yes
Motor bridge - Power unit	X20SM1426	X20SM1436
Quantity		1
Type		2-phase bipolar stepper motor (full bridge)
Nominal voltage	24 VDC	24 to 39 VDC ±25%
Nominal current	1 A	3 A
Maximum current	1,2 A for 2 s (after a recovery time of at least 10 s at maximal 1 A)	3,5 A for 2 s (after a recovery time of at least 10 s at maximal 3 A)
Controller frequency		38.4 kHz
DC bus capacitance	57 µF	100 µF
Step resolution		Max. 256 microsteps per step
Module supply		
Supply	-	External
Fuse	-	Required line fuse: Max. 16 A, slow-blow
Output protection	-	No reverse polarity protection for supply voltage
Digital inputs	X20SM1426	X20SM1436
Quantity		4
Nominal voltage		24 VDC
Input filter		
Hardware		<5 µs
Software		-
Connection type		1-wire connections
Input circuit		Sink
Additional functions		1x ABR incremental encoder
ABR incremental encoder	X20SM1426	X20SM1436
Quantity		1
Encoder inputs		24 V, asymmetrical
Counter size		16-bit
Input frequency		Max. 50 kHz
Evaluation		4x

X20SM1426, X20SM1436

Environmental conditions	X20SM1426	X20SM1436
Temperature		
Operation		
Horizontal installation		0 to 50°C
Vertical installation		Not allowed
Mechanical characteristics	X20SM1426	X20SM1436
Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM31 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Additional module types

X20CM0985-1



Short description

I/O module	X20 energy measurement and synchronization module
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General information

Overvoltage category	II ¹⁾
Measurable frequency	15.2 Hz to 2x nominal frequency ²⁾
Power consumption	
Bus	1.05 W
Internal I/O	4 W
Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ³⁾	Yes
KC	Yes
GOST-R	Yes

Digital outputs

Design	FET positive switching
Quantity	5
Nominal voltage	24 VDC
Nominal output current	0.1 A
Total nominal current	0.5 A
Connection type	1-wire connections
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit

Relay outputs

Quantity	1
Design	Relay / Changeover contact
Nominal voltage	30 VDC / 240 VAC
Nominal frequency	DC / 45 to 63 Hz
Switching capacity	
Min.	10 mA / 5 VDC
Max.	30 W / 240 VAC
Nominal output current	1 A at 30 VDC / 1 A at 240 VAC
Actuator supply	External

Analog input voltage

Channels	8
Input	120 VAC / 480 VAC
Input type	Single-ended
Digital converter resolution	±15-bit
Conversion time	
50 Hz	10 ms
60 Hz	8.33 ms
Output format	INT
Input impedance in signal range	Approx. 3 MΩ
Max. error at 25°C	
Gain	0.09% ⁴⁾
Offset	0.03% ⁵⁾
Input protection	Overvoltage protection

X20CM0985-1

Analog input current

Channels	3
Input	1 A / 5 A AC
Input type	Isolated current transformer according to the compensation principle with a magnetic sensor, for connecting an external transformer
Digital converter resolution	±15-bit
Conversion time	
50 Hz	10 ms
60 Hz	8.33 ms
Output format	INT
Max. error at 25°C	
Gain	0.2% ⁴⁾
Offset	0.05% ⁶⁾
Thermal overcurrent ⁷⁾	15 x I _{Nom} for 0.2 s ⁸⁾
Monitored overcurrent	4 x I _{Nom} ⁸⁾
Input impedance ⁹⁾	
Measurement range 1 A	Max. 30 mΩ
Measurement range 5 A	Max. 10 mΩ

Environmental conditions

Temperature	
Operation	
Horizontal installation	-25 to 55°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Note	Order 2x X20TB12 terminal block separately Order 2x TB3102 and 2x TB3104 screw clamps separately
------	---

¹⁾ IEC 61131-2.

²⁾ Nominal frequency: 48 to 62 Hz. Synchronization is only possible at the nominal frequency.

³⁾ Ta min.: 0°C
Ta max.: See environmental conditions

⁴⁾ Based on the current measured value.

⁵⁾ Based on the measurement range 240 VAC / 960 VAC.

⁶⁾ Based on the measurement range 2 A / 10 A.

⁷⁾ This can result in the measurement hysteresis being offset in relation to the overcurrent.

⁸⁾ Based on the measurement range 1 A / 5 A.

⁹⁾ Including current transformer, circuit path and X20TB12 terminal block (5 mΩ)

Additional module types

X20CM4810



Short description

I/O module	X20 4-channel analog input module for vibration measurement and analysis for condition monitoring
------------	---

General information

Nominal voltage	24 VDC \pm 20%
Power consumption	
Bus	0.01 W
Internal I/O	2.5 W
Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
GOST-R	Yes

Analog inputs

Quantity	4
Input type	IEPE sensor: Acceleration
Digital converter resolution	24-bit
Type	Vibration input
Sampling frequency	51.5625 kHz
Input high pass cutoff frequency	34 mHz
Input low pass cutoff frequency	19.75 kHz
Downsampling	200 Hz, 500 Hz, 1 kHz, 2 kHz, 5 kHz, 10 kHz (configurable)
Frequency resolution of the spectrums	0.0629 Hz, 0.1574 Hz, 0.3147 Hz, 0.6294 Hz, 1.5736 Hz, 3.1471 Hz
Sensor supply	IEPE, 5 mA constant current source (4.9 - 5.5 mA), can be switched off for each channel

Environmental conditions

Temperature	
Operation	
Horizontal installation	-25 to 50°C
Vertical installation	-25 to 45°C

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20BM31 bus module separately
------	--

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20CM6209



Short description

I/O module	6 diodes, 24 VDC
------------	------------------

General information

Power consumption

Bus	-
Internal I/O	-
External I/O	2.5 W

Certification

CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GOST-R	Yes

Diode array

Nominal voltage	24 VDC
Nominal input current	1 A

Environmental conditions

Temperature

Operation

Horizontal installation	0 to 55°C
Vertical installation	0 to 50°C

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module or 1x X20BM01 supply bus module separately
------	--

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Additional module types

X20CM8281



Short description

I/O module 4 digital inputs, 2 digital outputs, 1 analog input, 1 analog output, special functions

General information

Power consumption

Bus	0.01 W
Internal I/O	1.75 W

Certification

CE	Yes
cULus	Yes
cCSAus HazLoc Class 1 Division 2	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	Yes
LR	Yes
GOST-R	Yes

Digital inputs

Quantity	4
Nominal voltage	24 VDC
Input filter	
Hardware	≤2 μs
Software	Default 1 ms, configurable between 0 and 25 ms in 0.2 ms intervals
Connection type	1-wire connections
Input circuit	Sink
Additional functions	20 kHz event counting, gate measurement

Event counter

Quantity	2
Signal form	Square wave pulse
Evaluation	Each falling edge, cyclic counter
Input frequency	Max. 20 kHz
Counter size	16-bit

Gate measurement

Quantity	1
Signal form	Square wave pulse
Evaluation	Rising edge - falling edge
Counter frequency	
Internal	48 MHz, 24 MHz, 12 MHz, 6 MHz, 3 MHz, 1.5 MHz, 750 kHz, 375 kHz, 187.5 kHz
Counter size	16-bit

Analog inputs

Quantity	1
Input	±10 V or 0 to 20 mA / 4 to 20 mA, via different terminal connections
Input type	Single ended
Digital converter resolution	
Voltage	±12-bit
Current	12-bit
Conversion time	400 μs, conversion runs asynchronously to the X2X Link cycle
Output format	INT
Input impedance in signal range	
Voltage	>1 MΩ
Current	-
Load	
Voltage	-
Current	<300 Ω

X20CM8281

Input protection	Protection against wiring with supply voltage
Max. error at 25°C	
Voltage	
Gain	0.08% ²⁾
Offset	0.02% ³⁾
Current	
Gain	0 to 20 mA = 0.08% / 4 to 20 mA = 0.1% ²⁾
Offset	0 to 20 mA = 0.03% / 4 to 20 mA = 0.16% ⁴⁾

Digital outputs

Design	FET positive switching
Quantity	2
Nominal voltage	24 VDC
Nominal output current	0.5 A
Total nominal current	1 A
Connection type	1-wire connections
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection

Analog outputs

Quantity	1
Output	±10 V or 0 to 20 mA, via different terminal connections
Digital converter resolution	12-bit
Conversion time	300 µs, conversion runs asynchronously to the X2X Link cycle
Power on/off behavior	Internal enable relay for booting and errors
Max. error at 25°C	
Voltage	
Gain	0.04% ⁵⁾
Offset	0.0225% ⁶⁾
Current	
Gain	0.05% ⁵⁾
Offset	0.125% ⁶⁾
Output protection	Short circuit protection

Environmental conditions

Temperature	
Operation	
Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately
------	--

- ¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions
- ²⁾ Based on the current measured value.
- ³⁾ Based on the 20 V measurement range.
- ⁴⁾ Based on the 20 mA measurement range.
- ⁵⁾ Based on the current output value.
- ⁶⁾ Based on the entire output range.

Additional module types

X20CM8323



Short description

I/O module	8 digital outputs for switching electromechanical loads, current monitoring, switching time detection, pulse width modulation
------------	---

General information

Power consumption	
Bus	0.01 W
Internal I/O	1 W (Rev. \geq G0), 1.5 W (Rev. $<$ G0)

Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GOST-R	Yes

Digital outputs

Nominal voltage	24 VDC
Nominal output current	0.6 A
Total nominal current	4.8 A
Connection type	1-wire connections
Output circuit	Sink
Output protection	Thermal cutoff if overcurrent or short circuit occurs, integrated protection for switching inductances
Pulse width modulation	
Period duration	1 ms (1 kHz) or 20 μ s (50 kHz)
Pulse duration	0 to 100%
Resolution for pulse duration	1%

Environmental conditions

Temperature	
Operation	
Horizontal installation	0 to 60°C (Rev. \geq G0); 0 to 55°C (Rev. $<$ G0) ²⁾
Vertical installation	0 to 50°C ³⁾

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately
------	--

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Rev. G0 and higher: Up to a maximum of 6 channels only are permitted to be switched on simultaneously over 55°C.

³⁾ Rev. G0 and higher: Up to a maximum of 6 channels only are permitted to be switched on simultaneously over 45°C.

X20PD0011, X20PD0012, X20PD0016, X20PD2113



Short description	X20PD0011	X20PD0012	X20PD0016	X20PD2113
Potential distributor module	12x ground on the terminal connections	12x 24 VDC on the terminal connections	5x 24 VDC on the terminal connections, 5x ground on the terminal connections	-
Potential distributor module with feed	-	-	-	6x 24 VDC on the terminal connections, 6x ground on the terminal connections
General information	X20PD0011	X20PD0012	X20PD0016	X20PD2113
Power consumption ¹⁾				
Bus			0.12 W	
Internal I/O	-	1 W	-	-
External I/O	1 W	-	1.15 W	1.15 W
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2			Yes	
ATEX Zone 2 ²⁾			Yes	
KC			Yes	
GL			Yes	
GOST-R			Yes	
Input supply	X20PD0011	X20PD0012	X20PD0016	X20PD2113
Nominal input voltage	-	-	24 VDC -15% / +20% external, external ground	-
Fuse	-	-	Integrated 6.3 A, slow-blow, can be replaced	-
Output supply	X20PD0011	X20PD0012	X20PD0016	X20PD2113
Nominal output voltage	-	-	24 VDC, ground	-
Permitted contact load	-	-	10 A	-
Input supply with feed	X20PD0011	X20PD0012	X20PD0016	X20PD2113
Nominal input voltage	-	-	-	24 VDC -15% / +20% external, external ground
Input current	-	-	-	Max. 6 A
Fuse	-	-	-	Integrated 6.3 A, slow-blow, can be replaced
Output I/O supply	X20PD0011	X20PD0012	X20PD0016	X20PD2113
Nominal output voltage	Ground from the internal I/O supply	24 VDC from the internal I/O supply	-	24 VDC, ground
Fuse	Integrated 6.3 A, slow-blow, can be replaced	Integrated 6.3 A, slow-blow, can be replaced	-	-
Permitted contact load	10 A	10 A	-	6 A
Environmental conditions	X20PD0011	X20PD0012	X20PD0016	X20PD2113
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20PD0011	X20PD0012	X20PD0016	X20PD2113
Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 1x X20TB12 terminal block separately Order 1x X20BM01 or X20BM11 bus module separately

¹⁾ The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R website.

²⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Additional module types

X20PS4951



Short description

System module Supplies 4 potentiometers with ± 10 V

General information

Power consumption

Bus	0.01 W
Internal I/O	1.8 W

Certification

CE	Yes
cULus	Yes
cCSAus HazLoc Class 1 Division 2	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	Yes
LR	Yes
GOST-R	Yes

Potentiometer supply

Number of supplies	4
Voltage	± 10 V
Potentiometer resistance	1 k Ω to 10 k Ω
Load	Max. 20 mA per supply channel
Short circuit protection	Yes
Basic accuracy	
+10 V	$\pm 0.12\%$ at 25°C
-10 V	$\pm 0.21\%$ at 25°C

Environmental conditions

Temperature

Operation	
Horizontal installation	0 to 55°C
Vertical installation	0 to 50°C

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately
------	--

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Counter modules

X20DC1178, X20DC1198, X20DC1398, X20DC2398



Short description	X20DC1178	X20DC1198	X20DC1398	X20DC2398
I/O module	1 SSI absolute encoder 5 V	1 SSI absolute encoder 5 V	1 SSI absolute encoder 24 V	2 SSI absolute encoders 24 V
General information	X20DC1178	X20DC1198	X20DC1398	X20DC2398
Power consumption				
Bus			0.01 W	
Internal I/O	1.1 W	1.5 W	1.3 W	1.4 W
Channel - Encoder	-	No	No	No
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2	-	Yes	Yes	Yes
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL			Yes	
LR			Yes	
GOST-R			Yes	
Digital inputs	X20DC1178	X20DC1198	X20DC1398	X20DC2398
Quantity	2	2	1	2
Nominal voltage			24 VDC	
Input filter				
Hardware			≤2 µs	
Software			-	
Connection type			3-wire connections	
Input circuit			Sink	
SSI absolute encoder	X20DC1178	X20DC1198	X20DC1398	X20DC2398
Encoder inputs	-	5 V, symmetrical	24 V, asymmetrical	24 V, asymmetrical
Counter size	Encoder-dependent up to 32-bit	32-bit	32-bit	32-bit
Max. transfer rate	1 Mbit/s	1 Mbit/s	125 kbit/s	125 kbit/s
Encoder supply	-	-	Module-internal, max. 600 mA	Module-internal, max. 600 mA
Encoder signal	5 V, symmetrical	-	-	-
Encoder supply				
5 VDC	±5%, module-internal, max. 300 mA	±5%, module-internal, max. 300 mA	-	-
24 VDC	Module-internal, max. 300 mA	Module-internal, max. 300 mA	-	-
Environmental conditions	X20DC1178	X20DC1198	X20DC1398	X20DC2398
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20DC1178	X20DC1198	X20DC1398	X20DC2398
Note			Order 1x X20TB12 terminal block separately	Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Counter modules

X20DC1176, X20DC1196, X20DC1976, X20DC11A6



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Short description	X20DC1176	X20DC1196	X20DC1976	X20DC11A6
I/O module			1 ABR incremental encoder 5 V	
General information	X20DC1176	X20DC1196	X20DC1976	X20DC11A6
Power consumption				
Bus			0.01 W	
Internal I/O	1 W	1.5 W	1.2 W	1 W
Channel - Encoder	-	No	-	-
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2	-	Yes	-	-
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL			Yes	
LR			Yes	
GOST-R			Yes	
Digital inputs	X20DC1176	X20DC1196	X20DC1976	X20DC11A6
Quantity			2	
Nominal voltage			24 VDC	
Input filter				
Hardware	≤2 μs	≤2 μs	<2 μs	≤30 ns
Software			-	
Connection type			3-wire connections	
Input circuit			Sink	
Additional functions	Latch input	Home enable switch	Latch input	Latch input
ABR incremental encoder	X20DC1176	X20DC1196	X20DC1976	X20DC11A6
Encoder inputs	5 V, symmetrical	5 V, symmetrical	5 V, asymmetrical (single-ended)	5 V, symmetrical
Counter size			16/32-bit	
Input frequency	Max. 600 kHz	Max. 600 kHz	Max. 250 kHz	Max. 5 MHz
Evaluation			4x	
Encoder supply				
5 VDC		±5%, module-internal, max. 300 mA		
24 VDC		Module-internal, max. 300 mA		
Environmental conditions	X20DC1176	X20DC1196	X20DC1976	X20DC11A6
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20DC1176	X20DC1196	X20DC1976	X20DC11A6
Note		Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately		

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20DC1376, X20DC1396, X20DC137A, X20DC2396



	NetTime TECHNOLOGY		NetTime TECHNOLOGY	
Short description	X20DC1376	X20DC1396	X20DC137A	X20DC2396
I/O module	1 ABR incremental encoder 24 V	1 ABR incremental encoder 24 V	1 ABR incremental encoder 24 V, differential	2 ABR incremental encoders 24 V
General information	X20DC1376	X20DC1396	X20DC137A	X20DC2396
Power consumption				
Bus			0.01 W	
Internal I/O	1.3 W	1.4 W	1.2 W	1.5 W
Reference enable switch - Bus	-	Yes	-	Yes
Reference enable switch - Encoder	-	No	-	No
Reference switch - Reference switch	-	-	-	No
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2	-	Yes	-	Yes
ATEX Zone 2 ¹⁾			Yes	
KC	Yes	Yes	-	Yes
GL			Yes	
LR			Yes	
GOST-R			Yes	
Home enable switch	X20DC1376	X20DC1396	X20DC137A	X20DC2396
Quantity	-	1	-	2
Nominal voltage	-	24 VDC	-	24 VDC
Input filter				
Hardware	-	≤2 µs	-	≤2 µs
Software			-	
Connection type	-	3-wire connections	-	3-wire connections
Input circuit	-	Sink	-	Sink
Digital inputs	X20DC1376	X20DC1396	X20DC137A	X20DC2396
Quantity	2	-	2	-
Nominal voltage	24 VDC	-	24 VDC	-
Input filter				
Hardware	≤2 µs	-	≤2 µs	-
Software			-	
Connection type	3-wire connections	-	3-wire connections	-
Input circuit	Sink	-	Sink	-
Additional functions	Latch input	-	Latch input	-
ABR incremental encoder	X20DC1376	X20DC1396	X20DC137A	X20DC2396
Encoder inputs	24 V, asymmetrical (single-ended)	24 V, asymmetrical	24 V, differential	24 V, asymmetrical
Counter size			16/32-bit	
Input frequency	Max. 100 kHz	Max. 100 kHz	Max. 300 kHz	Max. 100 kHz
Evaluation			4x	
Encoder supply			Module-internal, max. 600 mA	
Environmental conditions	X20DC1376	X20DC1396	X20DC137A	X20DC2396
Temperature				
Operation				
Horizontal installation			-25 to 60°C	
Vertical installation			-25 to 50°C	
Mechanical characteristics	X20DC1376	X20DC1396	X20DC137A	X20DC2396
Note			Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Counter modules

X20DC2395, X20DC4395



Short description	X20DC2395	X20DC4395
I/O module	1 SSI absolute encoder, 24 V, 1 ABR incremental encoder, 24 V, 2 AB incremental encoders, 24 V, 4x event counters or 2x pulse width modulation, time measurement, relative timestamp	2 SSI absolute encoders, 24 V, 2 ABR incremental encoders, 24 V, 4 AB incremental encoders, 24 V, 8x event counters or 4x pulse width modulation, time measurement, relative timestamp
General information	X20DC2395	X20DC4395
Power consumption		
Bus		0.01 W
Internal I/O	1.4 W	1.5 W
Certification		
CE		Yes
cULus		Yes
cCSAus HazLoc Class 1 Division 2		Yes
ATEX Zone 2 ¹⁾		Yes
KC		Yes
GL		Yes
LR		Yes
GOST-R		Yes
Incremental encoder	X20DC2395	X20DC4395
Quantity	2	4
Encoder inputs		24 V, asymmetrical
Counter size		16/32-bit
Input frequency		Max. 100 kHz
Evaluation		4x
Encoder supply		Module-internal, max. 600 mA
SSI absolute encoder	X20DC2395	X20DC4395
Quantity	1	2
Encoder inputs		24 V, asymmetrical
Counter size		32-bit
Max. transfer rate		125 kbit/s
Encoder supply		Module-internal, max. 600 mA
Event counter	X20DC2395	X20DC4395
Quantity	4	8
Nominal voltage		24 VDC
Signal form		Square wave pulse
Evaluation		Each edge, cyclic counter
Input frequency		Max. 100 kHz
Counter size		16/32-bit
Edge detection / Time measurement	X20DC2395	X20DC4395
Possible measurements		Gate time, period duration, edge offset for various channels
Measurements per module		Up to 9
Measurements per channel		Up to 2
Counter size		16-bit
Counter frequency		
Internal	8 MHz, 4 MHz, 2 MHz, 1 MHz, 500 kHz, 250 kHz, 125 kHz, 62.5 kHz	
Signal form		Square wave pulse
Measurement type		Continuous or triggered

X20DC2395, X20DC4395

Digital outputs	X20DC2395	X20DC4395
Design		Push / Pull / Push-Pull
Quantity	2	4
Nominal voltage		24 VDC
Nominal output current		0.1 A
Total nominal current	0.2 A	0.4 A
Output circuit		Sink or source
Output protection	Thermal cutoff if overcurrent or short circuit occurs, integrated protection for switching inductances	
Pulse width modulation ²⁾		
Period duration		41.6 µs to 1.36 s
Factor for period duration		n/48000 s, n = 2 to 65535
Pulse duration		0 to 100%
Resolution for pulse duration		0.1%
Actuator supply		Module-internal, max. 600 mA
Environmental conditions	X20DC2395	X20DC4395
Temperature		
Operation		
Horizontal installation		-25 to 60°C
Vertical installation		-25 to 50°C
Mechanical characteristics	X20DC2395	X20DC4395
Note		Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Dead time when switching between push and pull: max. 1.5 µs.

Counter modules

X20CM1941



Short description

I/O module	1 resolver input, 1 ABR output
------------	--------------------------------

General information

Power consumption	
Bus	0.01 W
Internal I/O	1.5 W
Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GOST-R	Yes

Resolver inputs

Resolver transformation ratio	0.5 ($\pm 10\%$)
Reference output	
Frequency	10 kHz
Type	Differential
Angular position resolution	14-bit
Short circuit protection (reference output)	Yes

ABR output

Encoder signal	RS422
Type	ABR differential
ABR output (starting with firmware version 5)	
8-bit to 12-bit	3500 rpm
ABR output (up to firmware version 4) ²⁾	
8-bit	Max. 2343 rpm
9-bit	Max. 1171 rpm
10-bit	Max. 585 rpm
Short circuit protection	Yes (reference output)

Environmental conditions

Temperature	
Operation	
Horizontal installation	0 to 55°C
Vertical installation	0 to 50°C

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately
------	--

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Configurable

X20DC2190



Short description

I/O module	Ultrasonic transducer module, 2 transducer rods, 4 position detection, speed measurement
------------	--

General information

Power consumption	
Bus	0.01 W
Internal I/O	1.1 W
Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GOST-R	Yes

Channels for path and speed measurements

Quantity	2
Supported encoder types	Start/Stop interface EP start/stop interface DPI/IP interface
Encoder supply	
Voltage	24 VDC, module-internal, max. 150 mA
Monitoring	Configurable overvoltage/undervoltage monitoring ($\pm 10\%$, $\pm 15\%$, $\pm 20\%$, $\pm 25\%$)
Short circuit protection	Rev. D0 and higher
Input and output level	RS422 differential level
Multi-magnet measurement	Yes, in combination per rod, max. 4 magnets total
Outputs	1.6 μ s durational initialization pulse
Inputs	
Path measurement	Resolution = 0.01 mm, measurement range = ± 5.2 m
Speed measurement	Resolution = 0.1 mm/s, measurement range = ± 3.2 m/s
Precision	± 50 ppm ± 5 ppm/year
Short circuit protection	No

Environmental conditions

Temperature	
Operation	
Horizontal installation	0 to 55°C
Vertical installation	0 to 50°C

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately
------	--

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Modules for digital signal processing and preparation

X20CM1201



Short description

I/O module	1 AB incremental encoder, 24 V, 4 digital inputs, 4 channels configurable as inputs or outputs
------------	--

General information

Power consumption	
Bus	0.01 W
Internal I/O	1.5 W

Certification	
CE	Yes
cULus	Yes
cCSAus HazLoc Class 1 Division 2	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GOST-R	Yes

Digital inputs

Quantity	4 + 4 additional channels, configurable as inputs or outputs
Nominal voltage	24 VDC
Input filter	
Hardware	≤2 μs
Software	-
Connection type	1-wire connections
Input circuit	Sink

AB incremental encoder

Quantity	1
Encoder inputs	24 V, asymmetrical
Counter size	32-bit
Input frequency	Max. 100 kHz
Evaluation	4x
Encoder supply	Module-internal, max. 600 mA

Digital outputs

Design	Push / Pull / Push-Pull
Quantity	Up to 4, configurable as inputs or outputs using software
Nominal voltage	24 VDC
Nominal output current	0.1 A
Total nominal current	0.4 A
Connection type	1-wire connections
Output circuit	Sink or source
Output protection	Thermal cutoff if overcurrent or short circuit occurs, integrated protection for switching inductances
Actuator supply	Module-internal, max. 600 mA

Environmental conditions

Temperature	
Operation	
Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately
------	--

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20DS4389



NetTime
TECHNOLOGY

Short description

I/O module	4 digital input channels, 4 digital channels configurable as inputs or outputs, 4 edge detection units with timestamp function (each can be used to measure pulse duration or differential time, 4 history elements per unit), 4x edge generation with μs precision (up to 4 edges per unit), 4x oversampling (input and output signal)
------------	--

General information

Power consumption	
Bus	0.01 W
Internal I/O	1.5 W
Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	Yes
LR	Yes
GOST-R	Yes

Digital inputs

Quantity	4 + 4, configurable as inputs or outputs using software
Nominal voltage	24 VDC
Input circuit	Sink
Additional functions	4 edge detection units with timestamp function, 4x input oversampling
Input frequency	40 kHz

Digital outputs

Design	Push / Pull / Push-Pull
Quantity	Up to 4, configurable as inputs or outputs using software
Nominal voltage	24 VDC
Nominal output current	0.1 A
Total nominal current	0.4 A
Output circuit	Sink and/or source
Output protection	Thermal cutoff if overcurrent or short circuit occurs, integrated protection for switching inductances

Edge detection units

Quantity	4
Operating mode	4 pulse duration measurements, relative or absolute times of input edges in μs resolution, 4 history elements per unit
Counter size	16/32-bit
Input frequency (max.)	40 kHz
Resolution	125 ns timestamp function
Signal form	Square wave pulse
Sensor supply	Module-internal, max. 600 mA

Edge generation units

Quantity	4
Edge generation	
Absolute	Absolute to NetTime
Relative	Relative to other edges
Offset at relative edge generation	
Range of values	16 or 32 bit value
Resolution	1 μs
Actuator supply	Module-internal, max. 600 mA

Modules for digital signal processing and preparation

X20DS4389

Oversampling

Quantity	4
Sample time	25 to 255 μ s
Data volume	Up to 64-bit per X2X Link cycle in input and output direction

Environmental conditions

Temperature

Operation

Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately
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¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20DS1119



NetTime
TECHNOLOGY

Short description

I/O module	3 digital 5 V (symmetrical) channels configurable as inputs or outputs, 2 digital 24 V (asymmetrical) input channels, 1 universal counter pair (2 event counters, AB counter or up/down counter), linear movement generator (A/B; direction/frequency) with one reference pulse, SSI absolute encoder, relative or absolute times of input edges in μ s resolution, time-triggered I/O, I/O oversampling
------------	--

General information

Power consumption	
Bus	0.01 W
Internal I/O	1.5 W
Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	Yes
LR	Yes
GOST-R	Yes

Linear movement generator

Quantity	1
Encoder outputs	5 V, symmetrical (A/B; direction/frequency)
Counter size	16/32-bit

SSI absolute encoder

Quantity	1
Counter size	Encoder-dependent up to 32-bit
Max. transfer rate	1 Mbit/s
Encoder signal	5 V, symmetrical
Encoder supply	
5 VDC	\pm 5%, module-internal, max. 300 mA
24 VDC	Module-internal, max. 300 mA

Digital inputs 5 VDC

Quantity	Up to 3, configurable as inputs or outputs using software
Nominal voltage	5 VDC differential signal, EIA RS485 standard
Input frequency	600 kHz
Input filter	
Hardware	\leq 200 ns
Software	-
Additional functions	SSI absolute encoder, universal counter pair

Digital inputs 24 VDC

Quantity	2
Nominal voltage	24 VDC
Input frequency	100 kHz
Input circuit	Sink
Input filter	
Hardware	\leq 2 μ s
Software	-
Additional functions	Latch function for universal counter pair

Modules for digital signal processing and preparation

X20DS1119

Universal counter pair

Quantity	1
Operating modes	2x event counters, up/down counter, AB counter
Encoder inputs	5 V, symmetrical
Counter size	16/32-bit
Input frequency	Max. 600 kHz
Evaluation	
AB counter	4x
Event counter	2x
Up/Down counter	2x
Encoder supply	
5 VDC	±5%, module-internal, max. 300 mA
24 VDC	Module-internal, max. 300 mA

Digital outputs 5 VDC

Quantity	Up to 3, configurable as inputs or outputs using software
Type	5 VDC differential signal, EIA RS485 standard
Output circuit	Sink and/or source
Output protection	Short circuit protection
Additional functions	SSI absolute encoder, linear movement generator

Environmental conditions

Temperature	
Operation	
Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately
------	--

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20DS1319



NetTime
TECHNOLOGY

Short description

I/O module	4 digital input channels, 4 digital channels configurable as inputs or outputs, 1 universal counter pair (2 event counters, AB counter or up/down counter), linear movement generator (A/B; direction/frequency) with up to two reference pulses, SSI absolute encoder, relative or absolute times of input edges in μ s resolution, time-triggered I/O, I/O oversampling
------------	---

General information

Power consumption	
Bus	0.01 W
Internal I/O	1.5 W
Certification	
CE	Yes
cULus	Yes
cCSAus HazLoc Class 1 Division 2	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	Yes
LR	Yes
GOST-R	Yes

Linear movement generator

Quantity	1
Encoder outputs	24 V, asymmetrical (A/B; direction/frequency)
Counter size	16/32-bit

Digital inputs

Quantity	4 + 4, configurable as inputs or outputs using software
Nominal voltage	24 VDC
Input filter	
Hardware	$\leq 2 \mu$ s
Software	-
Input circuit	Sink
Additional functions	SSI absolute encoder, universal counter pair, latch function for universal counter pair
Input frequency	100 kHz

SSI absolute encoder

Quantity	1
Counter size	Encoder-dependent up to 32-bit
Max. transfer rate	125 kbit/s
Encoder supply	Module-internal, max. 600 mA
Nominal voltage	24 V, asymmetrical

Universal counter pair

Quantity	1
Operating modes	2x event counters, up/down counter, AB counter
Encoder inputs	24 V, asymmetrical
Counter size	16/32-bit
Input frequency	Max. 100 kHz
Evaluation	
AB counter	4x
Event counter	2x
Up/Down counter	2x

Modules for digital signal processing and preparation

X20DS1319

Digital outputs

Design	Push / Pull / Push-Pull
Quantity	Up to 4, configurable as inputs or outputs using software
Nominal voltage	24 VDC
Nominal output current	0.1 A
Total nominal current	0.4 A
Output circuit	Sink and/or source
Output protection	Thermal cutoff if overcurrent or short circuit occurs, integrated protection for switching inductances

Environmental conditions

Temperature	
Operation	
Horizontal installation	-25 to 60°C
Vertical installation	-25 to 50°C

Mechanical characteristics

Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately
------	--

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20DC1073, X20DS1828, X20DS1928



NetTime
TECHNOLOGY

Short description	X20DC1073	X20DS1828	X20DS1928
I/O module	1x SinCos input	1x HIPERFACE interface	1x EnDat interface
General information	X20DC1073	X20DS1828	X20DS1928
Power consumption			
Bus		0.01 W	
Internal I/O		1.3 W	
Certification			
CE		Yes	
cULus		Yes	
ATEX Zone 2 ¹⁾		Yes	
KC		Yes	
GOST-R		Yes	
Encoder inputs	X20DC1073	X20DS1828	X20DS1928
Type	SinCos	-	EnDat 2.1/2.2
Angular position resolution		13-bit, with a 1 V _{SS} signal	
Encoder monitoring		Yes	
Max. encoder cable length	Max. 20 m, see "Calculation of the maximum encoder cable length"	10 m	10 m, with a line cross-section 4x 2x 0.14 mm ² and 1x 2x 0.5 mm ²
Sine/Cosine inputs			
Signal transmission		Differential signals, symmetrical	
Signal frequency	DC up to 400 kHz	DC up to 200 kHz	DC up to 400 kHz
Differential voltage		1 V _{SS}	
Common-mode voltage		Max. ±10 V	
Terminating resistor		120 Ω	
Encoder supply	X20DC1073	X20DS1828	X20DS1928
Output voltage	5 V	11 V	5 V (±5%)
Load capability	300 mA	150 mA	300 mA
Protective measures			
Overload protection		Yes	
Short circuit protection		Yes	
Parameter channel (RS485)	X20DC1073	X20DS1828	X20DS1928
Signal transmission	-	5 VDC differential signal, EiA RS485 standard	-
Transmission status	-	See HIPERFACE specification	-
Serial EnDat interface	X20DC1073	X20DS1828	X20DS1928
Signal transmission	-	-	5 VDC differential signal, EiA RS485 standard
Transmission status	-	-	See EnDat specification
Environmental conditions	X20DC1073	X20DS1828	X20DS1928
Temperature			
Operation			
Horizontal installation		-25 to 60°C	
Vertical installation		-25 to 50°C	
Mechanical characteristics	X20DC1073	X20DS1828	X20DS1928
Note		Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Modules for digital signal processing and preparation

X20DS4387, X20DS438A



Short description	X20DS4387	X20DS438A
I/O module		IO-Link master with 4 IO-Link interfaces
General information	X20DS4387	X20DS438A
Power consumption		
Bus		0.01 W
Internal I/O	1.6 W	0.71 W
Certification		
CE		Yes
cULus		Yes
cCSAus HazLoc Class 1 Division 2	Yes	-
ATEX Zone 2 ¹⁾		Yes
KC	Yes	-
GOST-R		Yes
IO-Link in master mode	X20DS4387	X20DS438A
Transfer rates		
COM1		4.8 kbaud
COM2		38.4 kbaud
COM3		230.4 kbaud
Limits for COM3		
Max. connection capacitance	47 nF (cable + IO-Link device)	22 nF (cable + IO-Link device)
Max. load	100 Ω / 0.3 A	96 Ω / 250 mA
Data format		1 start bit, 8 data bits, 1 parity bit (even), 1 stop bit
Bus level		24 VDC (active), 0 VDC (resting voltage)
IO-Link device supply	24 VDC / max. 0.3 A per interface (protected)	-
IO-Link in SIO mode "digital output"	X20DS4387	X20DS438A
Nominal voltage		24 VDC
Nominal output current	0.2 A	0.25 A
Total nominal current	0.4 A	Max. 1 A
Output circuit		Sink or source
Output protection	Thermal cutoff if overcurrent or short circuit occurs, integrated protection for switching inductances	
Actuator supply	24 VDC / max. 0.3 A per interface (protected)	-
IO-Link in SIO mode "digital input"	X20DS4387	X20DS438A
Nominal voltage		24 VDC
Input filter		
Hardware	100 ns	300 ns
Software		-
Input circuit		Sink
Sensor supply	24 VDC / max. 0.3 A per interface (protected)	-
Environmental conditions	X20DS4387	X20DS438A
Temperature		
Operation		
Horizontal installation	0 to 55°C	-25 to 60°C
Vertical installation	0 to 45°C	-25 to 50°C
Mechanical characteristics	X20DS4387	X20DS438A
Note		Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20CP1382-RT, X20CP1381-RT



Short description	X20CP1382-RT	X20CP1381-RT
Interfaces	1x RS232, 1x Ethernet, 1x POWERLINK, 2x USB, 1x X2X Link, 1x CAN bus	
System module	CPU	
General information	X20CP1382-RT	X20CP1381-RT
Cooling		Fanless
CPU redundancy possible		No
reACTION-capable I/O channels		Yes
Power consumption without interface module and USB	5.8 W	5.1 W
Internal power consumption of the X2X Link and I/O supply ¹⁾		
Bus		0.8 W
Internal I/O		0.8 W
Certification		
CE		Yes
cULus		Yes
ATEX Zone 2 ²⁾		Yes
GOST-R		Yes
CPU and X2X Link supply	X20CP1382-RT	X20CP1381-RT
Input voltage	24 VDC -15% / +20%	
Input current	Max. 1 A	
Fuse	Integrated, cannot be replaced	
Reverse polarity protection	Yes	
X2X Link supply output	X20CP1382-RT	X20CP1381-RT
Nominal output power	2 W	
Parallel operation	Yes ³⁾	
Redundant operation	Yes ⁴⁾	
Input I/O supply	X20CP1382-RT	X20CP1381-RT
Input voltage	24 VDC -15% / +20%	
Fuse	Required line fuse: Max. 10 A, slow-blow	
Output I/O supply	X20CP1382-RT	X20CP1381-RT
Nominal output voltage	24 VDC	
Permitted contact load	10 A	
Controller	X20CP1382-RT	X20CP1381-RT
Real-time clock	Buffering for at least 300 hours at 25°C, 1 s resolution, -18 to 28 ppm accuracy at 25°C	
Processor		
Type		Vx86EX
Clock frequency	400 MHz	200 MHz
L1 cache		
Data code		16 kB
Program code		16 kB

X20CP1382-RT, X20CP1381-RT

Modular interface slots		1
Remanent variables	32 kB FRAM, buffering >10 years ⁵⁾	16 kB FRAM, buffering >10 years ⁵⁾
Shortest task class cycle time	1 ms	2 ms
Typical instruction cycle time	0.0199 µs	0.0419 µs
Standard memory		
RAM	256 MB DDR3 SDRAM	128 MB DDR3 SDRAM
Program memory		
Type	2 GB eMMC flash memory	1 GB eMMC flash memory
Data retention		10 years
Guaranteed clear/write cycles		20,000
Interfaces	X20CP1382-RT	X20CP1381-RT
IF1 interface		
Signal		RS232
Design		Connection made using 16-pin X20TB1F terminal block
Max. distance		900 m
Transfer rate		Max. 115.2 kbit/s
IF2 interface		
Signal		Ethernet
Design		1x RJ45 shielded
Cable length		Max. 100 m between 2 stations (segment length)
Transfer rate		10/100 Mbit/s
Transmission		
Physical layer		10BASE-T / 100BASE-TX
Half-duplex		Yes
Full-duplex		Yes
Autonegotiation		Yes
Auto-MDI / MDIX		Yes
IF3 interface		
Fieldbus		POWERLINK managing or controlled node
Type		Type 4 ⁶⁾
Design		1x RJ45 shielded
Cable length		Max. 100 m between 2 stations (segment length)
Transfer rate		100 Mbit/s
Transmission		
Physical layer		100BASE-TX
Half-duplex		Yes
Full-duplex		No
Autonegotiation		Yes
Auto-MDI / MDIX		Yes
IF4 interface		
Type		USB 1.1/2.0
Design		Type A
Max. output current		0.5 A
IF5 interface		
Type		USB 1.1/2.0
Design		Type A
Max. output current		0.1 A
IF6 interface		
Fieldbus		X2X Link master
IF7 interface		
Signal		CAN bus
Design		Connection made using 16-pin X20TB1F terminal block
Max. distance		1000 m
Transfer rate		Max. 1 Mbit/s

X20CP1382-RT, X20CP1381-RT

Digital inputs	X20CP1382-RT	X20CP1381-RT
Quantity	14 standard inputs, 4 high-speed inputs and 4 mixed channels, configurable as inputs or outputs using software	
Nominal voltage	24 VDC	
Input filter		
Hardware	Standard inputs and mixed channels: $\leq 200 \mu\text{s}$ High-speed inputs: $\leq 2 \mu\text{s}$, when used as standard inputs: $\leq 200 \mu\text{s}$	
Software	Default 1 ms, configurable between 0 and 25 ms in 0.1 ms intervals	
Connection type	1-wire connections	
Input circuit	Sink	
Additional functions	X2 - High-speed digital inputs: 2x 250 kHz event counting, 2x AB counters, ABR incremental encoder, direction/frequency, period measurement, gate measurement, differential time measurement, edge counters, edge times	
AB incremental encoder	X20CP1382-RT	X20CP1381-RT
Quantity	2	
Encoder inputs	24 V, asymmetrical	
Counter size	32-bit	
Input frequency	Max. 100 kHz	
Evaluation	4x	
Encoder supply	Module-internal, max. 300 mA	
ABR incremental encoder	X20CP1382-RT	X20CP1381-RT
Quantity	1	
Encoder inputs	24 V, asymmetrical	
Counter size	32-bit	
Input frequency	Max. 100 kHz	
Evaluation	4x	
Encoder supply	Module-internal, max. 300 mA	
Event counter	X20CP1382-RT	X20CP1381-RT
Quantity	2	
Signal form	Square wave pulse	
Evaluation	1x	
Input frequency	Max. 250 kHz	
Counter size	32-bit	
Edge detection / Time measurement	X20CP1382-RT	X20CP1381-RT
Possible measurements	Period measurement, gate measurement, differential time measurement, edge counter, edge times	
Measurements per module	Each function up to 2x	
Counter size	32-bit	
Timestamp	1 μs resolution	
Signal form	Square wave pulse	
Analog inputs	X20CP1382-RT	X20CP1381-RT
Quantity	2 ⁷⁾	
Input	$\pm 10 \text{ V}$ or 0 to 20 mA / 4 to 20 mA, via different terminal connections	
Input type	Differential input	
Digital converter resolution		
Voltage	± 12 -bit	
Current	12-bit	
Conversion time	1 channel enabled: 100 μs 2 channels enabled: 200 μs	
Output format		
Data type	INT	
Input impedance in signal range		
Voltage	20 M Ω	
Current	-	
Load		
Voltage	-	
Current	<300 Ω	

X20CP1382-RT, X20CP1381-RT

Input protection	Protection against wiring with supply voltage	
Max. error at 25°C		
Voltage		
Gain	0.18% (Rev. <C0: 0.37%) ⁸⁾	
Offset	0.04% (Rev. <C0: 0.25%) ⁹⁾	
Current		
Gain	0 to 20 mA = 0.15% (Rev. <C0: 0.52%) / 4 to 20 mA = 0.25% ⁸⁾	
Offset	0 to 20 mA = 0.1% (Rev. <C0: 0.4%) / 4 to 20 mA = 0.15% ¹⁰⁾	
Temperature inputs resistance measurement	X20CP1382-RT	X20CP1381-RT
Quantity	1	
Input	Resistance measurement with constant current supply for 2-wire connections	
Digital converter resolution	13-bit	
Conversion time	Only temperature input enabled: 200 µs Temperature and analog input enabled: 400 µs	
Output format	INT or UINT for resistance measurement	
Sensor		
PT1000	-200 to 850°C	
Resistance measurement range	0.1 to 4000 Ω	
Max. error at 25°C		
Gain	0.3% (Rev. <C0: 1.93%) ¹¹⁾	
Offset	0.15% (Rev. <C0: 0.32%) ¹²⁾	
Digital outputs	X20CP1382-RT	X20CP1381-RT
Design	Standard outputs and mixed channels: FET positive switching High-speed outputs: Push-Pull	
Quantity	4 standard outputs, 4 high-speed outputs and 4 mixed channels, configurable as inputs or outputs using software	
Nominal voltage	24 VDC	
Nominal output current	Standard outputs and mixed channels: 0.5 A High-speed outputs: 0.2 A	
Total nominal current	Standard outputs and mixed channels: 4 A High-speed outputs: 0.8 A	
Connection type	1-wire connections	
Output circuit	Standard outputs and mixed channels: Source High-speed outputs: Sink or source	
Output protection ¹³⁾	Thermal cutoff if overcurrent or short circuit occurs (see value "Peak short circuit current") Internal inverse diode for switching inductive loads (see section "Switching inductive loads")	
Pulse width modulation ¹⁴⁾		
Period duration	5 to 65535 µs corresponds to 200 kHz to 15 Hz	
Pulse duration	0 to 100%, minimum 2.5 µs	
Resolution for pulse duration	0.1% of the configured frequency	
Environmental conditions	X20CP1382-RT	X20CP1381-RT
Temperature		
Operation		
Horizontal installation	-25 to 60°C (Rev. <D0: -25 to 55°C)	-25 to 60°C
Vertical installation		-25 to 50°C
Mechanical characteristics	X20CP1382-RT	X20CP1381-RT
Note	X20 locking plate (right) included in delivery 3 X20 terminal blocks (16-pin) included in delivery Interface module slot cover included in delivery	
Dimensions		
Width	164 mm	
Height	99 mm	
Depth	75 mm	

X20CP1382-RT, X20CP1381-RT

- ¹⁾ The specified values are maximum values. The exact calculation is available with the other module documentation for download from the B&R website.
- ²⁾ Ta min.: 0°C
Ta max.: See environmental conditions
- ³⁾ When operated in parallel, the nominal power of 2 W is not permitted to be added to the total power.
- ⁴⁾ Up to 2 W bus load.
- ⁵⁾ Can be set in Automation Studio.
- ⁶⁾ See the POWERLINK section of the AS help system under „Communication, POWERLINK, General information, Hardware - IF/LS“.
- ⁷⁾ To reduce power dissipation, B&R recommends bridging unused inputs on the terminals or configuring them as current signals.
- ⁸⁾ Based on the current measured value.
- ⁹⁾ Based on the 20 V measurement range.
- ¹⁰⁾ Based on the 20 mA measurement range.
- ¹¹⁾ Based on the current resistance value.
- ¹²⁾ Based on the entire resistance measurement range.
- ¹³⁾ For high-speed digital outputs, derating must be applied at switching frequencies >50 kHz (see section "Switching frequency derating for high-speed digital outputs"). Overtemperature protection is not provided.
- ¹⁴⁾ The high-speed digital outputs can be used for pulse width modulation.

X20RT8001, X20RT8201, X20RT8202



Short description	X20RT8001	X20RT8201	X20RT8202
I/O module	4 digital input channels, 4 digital channels configurable as inputs or outputs, reACTION technology	4 digital input channels, 4 digital channels configurable as inputs or outputs, 2 analog inputs ± 10 V, reACTION technology	4 digital input channels, 4 digital channels configurable as inputs or outputs, 2 analog outputs ± 10 V, reACTION technology
General information	X20RT8001	X20RT8201	X20RT8202
reACTION-capable I/O channels		Yes	
Power consumption			
Bus		-	
Internal I/O	1 W	1.6 W	1.6 W
Certification			
CE		Yes	
cULus	Yes	-	-
ATEX Zone 2 ¹⁾	Yes	-	-
GOST-R		Yes	
Encoder supply	X20RT8001	X20RT8201	X20RT8202
Output voltage		24 VDC -15% / +20%	
Output current ²⁾		Module-internal, max. 600 mA	
Short circuit protection, overload protection		Yes	
Digital inputs	X20RT8001	X20RT8201	X20RT8202
Quantity		4 inputs and 4 mixed channels, configurable as inputs or outputs using software	
Nominal voltage		24 VDC	
Input filter			
Hardware		<1.5 μ s	
Software		Default 200 ns, configurable between 200 ns and 5 ms in 10 ns intervals	
Connection type		1-wire connections	
Input circuit		Sink	
Analog inputs	X20RT8001	X20RT8201	X20RT8202
Quantity	-	2 ³⁾	-
Input	-	± 10 V	-
Input type	-	Differential input	-
Digital converter resolution	-	± 12 -bit	-
Output format			
Data type	-	INT	-
Input impedance in signal range	-	20 M Ω	-
Input protection	-	Protection against wiring with supply voltage	-
Max. error at 25°C			
Gain	-	0.08% ⁴⁾	-
Offset	-	0.018% ⁵⁾	-
Sampling frequency	-	500 kHz	-

X20RT8001, X20RT8201, X20RT8202

Digital outputs	X20RT8001	X20RT8201	X20RT8202
Design			Push-Pull
Quantity ²⁾		4 mixed channels, configurable as inputs or outputs using software	
Nominal voltage			24 VDC
Nominal output current			100 mA
Total nominal current			400 mA
Connection type			1-wire connections
Output circuit			Sink or source
Output protection		Thermal cutoff if overcurrent or short circuit occurs (see value "Peak short circuit current")	
Analog outputs	X20RT8001	X20RT8201	X20RT8202
Output	-	-	±10 V
Digital converter resolution	-	-	±12-bit
Power on/off behavior	-	-	Internal enable relay for booting
Max. error at 25°C			
Gain	-	-	0.15% ⁶⁾
Offset	-	-	0.05% ⁷⁾
Output protection	-	-	Short circuit protection
Environmental conditions	X20RT8001	X20RT8201	X20RT8202
Temperature			
Operation			
Horizontal installation			-25 to 60°C
Vertical installation			-25 to 50°C
Mechanical characteristics	X20RT8001	X20RT8201	X20RT8202
Note	Order 1x X20TB12 terminal block separately Order 1x X20BM11 bus module separately	Order 2x X20TB12 terminal block separately Order 1x X20BM31 bus module separately	Order 2x X20TB12 terminal block separately Order 1x X20BM31 bus module separately

¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

²⁾ See section "Derating and hardware configuration".

³⁾ To reduce power dissipation, B&R recommends bridging unused inputs on the terminals.

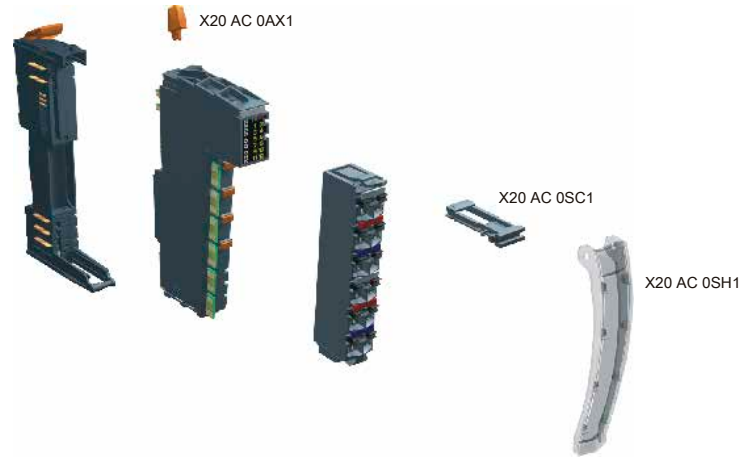
⁴⁾ Based on the current measured value.

⁵⁾ Based on the 20 V measurement range.

⁶⁾ Based on the current output value.

⁷⁾ Based on the entire output range.

Accessories



Tag holders, terminal locking clips



Model number	Short description
X20AC0SC1	X20 terminal locking clip and tag holder for plain text tag
X20AC0SC1.0100	X20 terminal locking clip and tag holder for plain text tag, 100 pcs. per package

Plain text tags



Model number	Short description
X20AC0SH1	X20 plain text tag
X20AC0SH1.0100	X20 plain text tag, 100 pcs. per package
X20AC0LB1.0100	X20 slide-in labels for X20 plain text tag, paper, white, perforated, 84 labels on A4 sheets, 100 sheets per package

Optional locking clips



Model number	Short description
X20AC0AX1	X20 optional locking clip
X20AC0AX1.0100	X20 optional locking clip, 100 pcs. per package

Locking plates



Model number	Short description
X20AC0SL1	X20 locking plate, left
X20AC0SR1	X20 locking plate, right
X20AC0SL1.0010	X20 locking plate, left, 10 pcs. per package
X20AC0SR1.0010	X20 locking plate, right, 10 pcs. / package

Cable shield connector



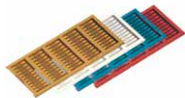
Model number	Short description
X20AC0SG1.0010	X20 cable shield grounding connector, 10 pcs. per package
X20AC0SG1.0100	X20 cable shield grounding connector, 100 pcs. per package

Shielding bracket



Model number	Short description
X20AC0SF7.0010	X20 shielding bracket 66 mm
X20AC0SF9.0010	X20 shielding bracket 88 mm

Terminal labeling



Model number	Short description
X20AC0M01	Blank X20 tag labels, white, set for 16 modules
X20AC0M01.0010	Blank X20 tag labels, white, set for 16 modules, 10 pcs. per package
X20AC0M02	Blank X20 tag labels, red, set for 16 modules
X20AC0M02.0010	Blank X20 tag labels, red, set for 16 modules, 10 pcs. per package
X20AC0M03	Blank X20 tag labels, blue, set for 16 modules
X20AC0M03.0010	Blank X20 tag labels, blue, set for 16 modules, 10 pcs. per package
X20AC0M04	Blank X20 tag labels, orange, set for 16 modules
X20AC0M04.0010	Blank X20 tag labels, orange, set for 16 modules, 10 pcs. per package
X20AC0M11	Printed X20 tag labels, white, set for 16 modules, label text: Module (Module 1-16), Terminal (1-192)
X20AC0M11.0010	Printed X20 tag labels, white, set for 16 modules, 10 pcs. per package, label text: Module (Module 1-16), Terminal (1-192)
X20AC0M12	Printed X20 tag labels, red, set for 16 modules, label text: +24 V
X20AC0M12.0010	Printed X20 tag labels, red, set for 16 modules, 10 pcs. / package, label text: +24 V
X20AC0M13	Printed X20 tag labels, blue, set for 16 modules, label text: GND
X20AC0M13.0010	Printed X20 tag labels, blue, set for 16 modules, 10 pcs. / package, label text: GND
X20AC0M14	Printed X20 tag labels, orange, set for 16 modules, label text: Module (Module 1-16), Terminal (1-192)
X20AC0M14.0010	Printed X20 tag labels, orange, set for 16 modules, 10 pcs. / package, label text: Module (Module 1-16), Terminal (1-192)
X20AC0M21	Blank X20 tag labels, large, white, set for 48 modules
X20AC0M21.0010	Blank X20 tag labels, large, white, set for 48 modules, 10 pcs. / package

Labeling tool



Model number	Short description
X20AC0MT1	X20 labeling tool, for X20 tag labels

Accessories

Screwdriver



Model number	Short description
X20AC0SD1	B&R screwdriver

X2X Link cables



Model number	Short description
X67CA0X99.1000	Cable for custom assembly, 100 m
X67CA0X99.5000	Cable for custom assembly, 500 m

POWERLINK cable, RJ45 to RJ45



Connection cables

Length	Model number	Short description
0.2 m	X20CA0E61.00020	POWERLINK connection cable, RJ45 to RJ45, 0.20 m
0.25 m	X20CA0E61.00025	POWERLINK connection cable, RJ45 to RJ45, 0.25 m
0.3 m	X20CA0E61.00030	POWERLINK connection cable, RJ45 to RJ45, 0.30 m
0.35 m	X20CA0E61.00035	POWERLINK connection cable, RJ45 to RJ45, 0.35 m
0.4 m	X20CA0E61.00040	POWERLINK connection cable, RJ45 to RJ45, 0.40 m
0.5 m	X20CA0E61.00050	POWERLINK connection cable, RJ45 to RJ45, 0.50 m
1 m	X20CA0E61.00100	POWERLINK connection cable, RJ45 to RJ45, 1.00 m
1.5 m	X20CA0E61.00150	POWERLINK connection cable, RJ45 to RJ45, 1.50 m
2 m	X20CA0E61.00200	POWERLINK connection cable, RJ45 to RJ45, 2.00 m
5 m	X20CA0E61.00500	POWERLINK connection cable, RJ45 to RJ45, 5.00 m
10 m	X20CA0E61.01000	POWERLINK connection cable, RJ45 to RJ45, 10.00 m
15 m	X20CA0E61.01500	POWERLINK connection cable, RJ45 to RJ45, 15.00 m
20 m	X20CA0E61.02000	POWERLINK connection cable, RJ45 to RJ45, 20.00 m

For detailed information and support: www.br-automation.com

POWERLINK cable, RJ45 to RJ45



Connection cables

Length	Model number	Short description
50 m	X20CA0E61.0500	POWERLINK connection cable RJ45 to RJ45, 50.0 m

POWERLINK cables, RJ45 to RJ45, can be used in cable drag chains

Length	Model number	Short description
10 m	X20CA3E61.0100	POWERLINK connection cable, RJ45 to RJ45, can be used in drag chains, 10.0 m
15 m	X20CA3E61.0150	POWERLINK connection cable, RJ45 to RJ45, can be used in drag chains, 15.0 m
35 m	X20CA3E61.0350	POWERLINK connection cable, RJ45 to RJ45, can be used in drag chains, 35.0 m

For detailed information and support: www.br-automation.com

Accessories

POWERLINK cables, RJ45 to M12



Attachment cable

Length	Model number	Short description
1 m	X67CA0E41.0010	POWERLINK attachment cable, RJ45 to M12, 1.0 m
5 m	X67CA0E41.0050	POWERLINK attachment cable, RJ45 to M12, 5.0 m
15 m	X67CA0E41.0150	POWERLINK attachment cable, RJ45 to M12, 15.0 m
50 m	X67CA0E41.0500	POWERLINK attachment cable, RJ45 to M12, 50.0 m

POWERLINK cable, RJ45 to M12, can be used in cable drag chains



Attachment cable

Length	Model number	Short description
15 m	X67CA3E41.0150	POWERLINK attachment cable, RJ45 to M12, can be used in cable drag chains, 15.0 m

For detailed information and support: www.br-automation.com

X2X Link device connection cables



Connection cables

Length	Model number	Short description
0.3 m	X20CA0X68.0003	X2X Link device connection cable, 0.3 m
1 m	X20CA0X68.0010	X2X Link device connection cable, 1.0 m
2 m	X20CA0X68.0020	X2X Link device connection cable, 2.0 m
5 m	X20CA0X68.0050	X2X Link device connection cable, 5.0 m
10 m	X20CA0X68.0100	X2X Link device connection cable, 10.0 m

X2X Link device connection cables, open



Connection cables

Length	Model number	Short description
1 m	X20CA0X48.0010	X2X Link device connection cable, open on one side, 1.0 m
2 m	X20CA0X48.0020	X2X Link device connection cable, open on one side, 2.0 m
5 m	X20CA0X48.0050	X2X Link device connection cable, open on one side, 5.0 m
10 m	X20CA0X48.0100	X2X Link device connection cable, open on one side, 10.0 m
20 m	X20CA0X48.0200	X2X Link device connection cable, open on one side, 20.0 m

For detailed information and support: www.br-automation.com



Protected against harsh environmental conditions - Coated X20 system

With the X20c series, B&R is setting new standards for protection against harsh environmental conditions. These variants of the modular X20 distributed controller and I/O product line are protected against condensation and corrosive gases by a coating on the electronics module. These modules are even suitable for use in adverse atmospheric conditions.

The coating on the electronics module protects the components and circuit board from the effects of condensation and corrosive gases. The effectiveness of protection against condensation is checked using the test specified in BMW GS 95011-4, and protection against corrosive gases using the 4-part corrosive gas tests specified in EN 60068-2-60, test method 4. The tests are completed both in the company testing lab, which is accredited in accordance with EN ISO/IEC 17025:2007, and at certified external testing facilities. There, the products undergo further testing to check their durability – even beyond standard requirements.

Independent of operating conditions

The X20 family with coated circuit boards is completely compatible with existing X20 models with respect to functionality. Using a unique module ID, the application software can differentiate these devices from standard models. With the introduction of this line, B&R has proven for the third time in rapid succession – after extending the general operating temperature range to -25 to +60°C and certification for maritime applications from Germanischer Lloyd (GL) – that they are dedicated to increasing their customers' return on investment by increasing the service life of the X20 system regardless of environmental conditions.

Highlights

- Modules with special coatings
- Corrosive gas test with H_2S , NO_2 , Cl_2 , SO_2
- Ambient temperature -25 to +60°C
- Protection against high humidity and condensation

Coated X20 systems

Product overview - Coated X20 systems

Below an overview of the coated X20 system modules available.

The modules' electronics are fully compatible with the corresponding X20 system modules without coating. A page reference about the technical data of the respective standard module is contained in the list.

The coated modules are essentially characterized by an expanded temperature range, specific protection properties regarding humidity and corrosive gases as well as a unique B&R ID code (see www.br-automation.com).

Bus modules



Model number	Short description	Page
X20cBM01	X20 power supply bus module, coated, 24 VDC keyed, internal I/O supply interrupted to the left	17
X20cBM11	X20 bus module, coated, 24 VDC keyed, internal I/O supply continuous	17
X20cBM12	X20 bus module, coated, 240 VAC keyed, internal I/O supply continuous	18
X20cBM31	X20 bus module, coated, for double-width modules, 24 VDC keyed, internal I/O supply continuous	18
X20cBM32	X20 bus module, coated, for double-width modules, 240 VAC keyed, internal I/O supply continuous	18

CPUs



Model number	Short description	Page
X20cCP3586	X20 CPU, coated, ATOM 1.6 GHz, 512 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 3 insert slots for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000 Base-T, 1 POWERLINK interface, incl. supply module, 1 X20TB12 terminal block, slot covers and X20 locking plate (right) X20AC0SR1 included, order application memory separately.	21
X20cCP1586	X20 CPU, coated, ATOM 1.6 GHz, 512 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 1 insert slot for X20 interface modules, 2 USB ports, 1 RS232 interface, 1 Ethernet interface 10/100/1000 Base-T, 1 POWERLINK interface, incl. supply module, 1 X20TB12 terminal block, slot cover and X20 locking plate (right) X20AC0SR1 included, order application memory separately.	21
X20cCP3584	X20 CPU, coated, ATOM 0.6 GHz, 256 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 3 insert slots for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100/1000 Base-T, 1 POWERLINK interface, incl. supply module, 1 X20TB12 terminal block, slot covers and X20 locking plate (right) X20AC0SR1 included, order application memory separately.	24
X20cCP1584	X20 CPU, coated, ATOM 0.6 GHz, 256 MB DDR2 RAM, 1 MB SRAM, removable application memory: CompactFlash, 1 insert slot for X20 interface modules, 2 USB ports, 1 RS232 interface, 1 Ethernet interface 10/100/1000 Base-T, 1 POWERLINK interface, incl. supply module, 1 X20TB12 terminal block, slot cover and X20 locking plate (right) X20AC0SR1 included, order application memory separately.	24

Bus controllers



Model number	Short description	Page
X20cBC0083	X20 bus controller, coated, 1 POWERLINK interface, integrated 2-port hub, 2x RJ45, order bus base, power supply module and terminal block separately	46
X20cBC0087	X20 bus controller, coated, Modbus/TCP or Modbus/UDP interface, integrated 2-port switch, 2x RJ45, order bus base, power supply module and terminal block separately	46
X20cBC0088	X20 bus controller, coated, 1 EtherNet/IP interface, integrated switch, web interface, 2x RJ45, order bus base, power supply module and terminal block separately	46
X20cBC00E3	X20 bus controller, coated, 1 PROFINET RT interface, integrated 2-port switch, 2x RJ45, order bus base, power supply module and terminal block separately	46

System modules for bus controllers



Model number	Short description	Page
X20cBB80	X20 bus base, coated, for X20 base module (BC, HB, etc.) and X20 power supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	47
X20cPS9400	X20 power supply module, coated, for bus controller and internal I/O supply, X2X Link supply	48

Expandable bus controllers



Model number	Short description	Page
X20cBC1083	X20 bus controller, coated, 1 POWERLINK interface, integrated 2-port hub, supports X20 interface module expansions, 2 RJ45, order bus base, power supply module and terminal block separately	50
X20cBC8083	X20 bus controller, coated, 1 POWERLINK interface, integrated 2-port hub, supports X20 hub module expansions, 2 RJ45, order bus base, power supply module and terminal block separately	50
X20cBC8084	X20 bus controller, coated, 1 POWERLINK interface, 1x link selector, for POWERLINK cable redundancy, supports active X20 hub module expansions, 2 RJ45, order bus base, power supply module and terminal block separately	50

System modules for expandable bus controllers



Model number	Short description	Page
X20cBB81	X20 bus base, coated, for X20 base module (BC, HB, etc.) and X20 power supply module, with one expansion slot for an X20 add-on module (IF, HB, etc.), X20 locking plates (left and right) X20AC0SL1/X20AC0SR1 included	51
X20cBB82	X20 bus base, coated, for X20 base module (BC, HB, etc.) and X20 power supply module, with two expansion slots for two X20 add-on modules (IF, HB, etc.), X20 locking plates (left and right) X20AC0SL1/X20AC0SR1 included	51

X20 interface module communication



Model number	Short description	Page
X20cIF1030	X20 interface module, coated, 1 RS422/485 interface, max. 115.2 Mbit/s, electrically isolated	53
X20cIF1072	X20 interface module, coated, 1 CAN bus interface, max. 1 Mbit/s, electrically isolated, order 1x TB2105 terminal block separately	55
X20cIF1082-2	X20 interface module, coated, 1 POWERLINK interface, managing or controlled node, integrated 2-port hub, ring redundancy function PRC function	56
X20cIF2181-2	X20 interface module, coated, 1x link selector for POWERLINK cable redundancy, POWERLINK functions: - Managing node - Controlled node for iCN operation - Redundant managing node for controller redundancy - Ring redundancy - 2x hub - Multi ASend - PRC function 2x RJ45	56
X20cIF1041-1	X20 interface module, coated, for DTM configuration, 1 CANopen master interface, electrically isolated, order 1x TB2105 terminal block separately	58
X20cIF1061-1	X20 interface module coated, for DTM configuration, 1 PROFIBUS DP V0/V1 master interface, electrically isolated	59
X20cIF1063-1	X20 interface module, coated, for DTM configuration, 1 PROFIBUS DP V1 slave interface, electrically isolated	59
X20cIF10D1-1	X20 interface module, coated, for DTM configuration, 1 EtherNet/IP scanner (master) interface, electrically isolated	60
X20cIF10D3-1	X20 interface module, coated, for DTM configuration, 1 EtherNet/IP adapter (slave) interface, electrically isolated	60
X20cIF10E3-1	X20 interface module, coated, for DTM configuration, 1 PROFINET RT device (slave) interface, electrically isolated	59

Coated X20 systems

X20 electronics module communication



Model number	Short description	Page
X20cCS1020	X20 interface module, coated, 1 RS232 interface, max. 115.2 kbit/s	61
X20cCS1030	X20 interface module, coated, 1 RS422/485 interface, max. 115.2 Mbit/s	61

Bus receivers/transmitters



Model number	Short description	Page
X20cBR9300	X20 bus receiver, coated, X2X Link, supply for X2X Link and internal I/O supply, X20 locking plates (left and right) X20AC0SL1/X20AC0SR1 included	63
X20cBT9100	X20 bus transmitter, coated, X2X Link, supply for internal I/O supply	63

Power supply modules



Model number	Short description	Page
X20cPS2100	X20 power supply module, coated, for internal I/O supply	65
X20cPS2110	X20 power supply module, coated, for internal I/O supply, integrated microfuse	65
X20cPS3300	X20 power supply module, coated, for X2X Link and internal I/O supply	65
X20cPS3310	X20 power supply module, coated, for X2X Link and internal I/O supply integrated microfuse	65

X20 hub system



Model number	Short description	Page
X20cHB8815	X20 POWERLINK - TCP/IP gateway, coated, can be expanded with active hub modules, 2x RJ45	68
X20cHB8880	X20 base hub module, coated, integrated 2-port hub, 2x RJ45	68

System modules for the X20 hub system



Model number	Short description	Page
X20cPS8002	X20 power supply module, coated, for standalone hub and compact link selector	70
X20cHB1881	X20 hub expansion module, coated, integrated 1-port hub, for fiber optic cable	71
X20cHB2880	X20 hub expansion module, coated, 2x RJ45	71
X20cHB2881	X20 hub expansion module, coated, integrated 2-port hub, for fiber optic cable	71

X20 redundancy system



Model number	Short description	Page
X20cHB8884	X20 compact link selector, coated, 2x RJ45, order bus base, power supply module and terminal block separately.	73

System modules for the X20 redundancy system



Model number	Short description	Page
X20cHB2885	X20 hub expansion module, coated, integrated active 2-port hub, 2x RJ45	74
X20cHB2886	X20 hub expansion module, coated, integrated active 2-port hub, 2 fiber optic interfaces	74

Digital inputs



Model number	Short description	Page
X20cDI4371	X20 digital input module, coated, 4 inputs, 24 VDC, sink, configurable input filter, 3-wire connections	75
X20cDI4375	X20 digital input module, coated, 4 inputs, 24 VDC, sink, configurable input filter, open line and short circuit detection, 3-wire connections	75
X20cDI4760	X20 digital input module, coated, 4 NAMUR inputs, 8.05 V	79
X20cDI6371	X20 digital input module, coated, 6 inputs, 24 VDC, sink, configurable input filter, 2-wire connections	76
X20cDI9371	X20 digital input module, coated, 12 inputs, 24 VDC, sink, configurable input filter, 1-wire connections	77
X20cDI9372	X20 digital input module, coated, 12 inputs, 24 VDC, source, configurable input filter, 1-wire connections	77

Digital outputs



Model number	Short description	Page
X20cDO2633	X20 digital output module, coated, 2 triac outputs, 12 to 240 VAC, 2 A, L switching, phase angle control, 240 V keyed	86
X20cDO4322	X20 digital output module, coated, 4 outputs, 24 VDC, 0.5 A, source, 3-wire connections	81
X20cDO4332	X20 digital output module, coated, 4 outputs, 24 VDC, 2 A, source, 3-wire connections	82
X20cDO4633	X20 digital output module, coated, 4 triac outputs, 12 to 240 VAC, 1 A, L switching, phase angle control, 240 V keyed	86
X20cDO4649	X20 digital output module, coated, 4 relays, N.O. contacts, 240 VAC / 5 A	85
X20cDO6321	X20 digital output module, coated, 6 outputs, 24 VDC, 0.5 A, sink, 2-wire connections	82
X20cDO6322	X20 digital output module, coated, 6 outputs, 24 VDC, 0.5 A, source, 2-wire connections	82
X20cDO6529	X20 digital output module, coated, 6 relays, normally open contacts, 115 VAC / 0.5 A, 30 VDC / 1 A	85
X20cDO6639	X20 digital output module, coated, 6 relays, normally open contacts, 240 VAC / 2 A, 30 VDC / 2 A	86
X20cDO8331	X20 digital output module, coated, 8 outputs, 24 VDC, 2 A, sink, supply directly on module, 1-wire connections	83
X20cDO8332	X20 digital output module, coated, 8 outputs, 24 VDC, 2 A, source, supply directly on module, 1-wire connections	83
X20cDO9321	X20 digital output module, coated, 12 outputs, 24 VDC, 0.5 A, sink, 1-wire connections	84
X20cDO9322	X20 digital output module, coated, 12 outputs, 24 VDC, 0.5 A, source, 1-wire connections	84

Coated X20 systems

Digital inputs and outputs



Model number	Short description	Page
X20cDM9324	X20 digital mixed module, coated, 8 inputs, 24 VDC, sink, configurable input filter, 4 outputs, 24 VDC, 0.5 A, source, 1-wire connections	88

Analog inputs



Model number	Short description	Page
X20cAI1744	X20 analog input module, coated, 1 full-bridge strain gauge input, 24-bit converter resolution, 5 kHz input filter	97
X20cAI2438	X20 analog input module, coated, 2 inputs, 4-20 mA, 16-bit converter resolution, single channel electrically isolated and with separate sensor supply, supports the HART protocol	95
X20cAI4622	X20 analog input module, coated, 4 inputs, ± 10 V or 0 to 20 mA / 4 to 20 mA, 13-bit converter resolution, configurable input filter	93
X20cAI4632	X20 analog input module, coated, 4 inputs, ± 10 V or 0 to 20 mA, 16-bit converter resolution, configurable input filter, oscilloscope functions	93
X20cAI4632-1	X20 analog input module, coated, 4 inputs, ± 11 V or 0 to 22 mA, 16-bit converter resolution, configurable input filter, oscilloscope functions	93
X20cAP3121	X20 energy metering module, coated, 3 analog inputs, 480 VAC, 50/60 Hz, 4 analog inputs, 1 AAC, calculates effective, reactive and apparent power/energy, calculates root mean square values, 240 V keyed	99

Analog outputs



Model number	Short description	Page
X20cAO2437	X20 analog output module, coated, 2 outputs, 4 to 20 mA / 0 to 20 mA or 0 to 24 mA, 16-bit converter resolution, single channel electrically isolated	104
X20cAO2438	X20 analog output module, coated, 2 outputs, 4 to 20 mA / 0 to 20 mA or 0 to 24 mA, 16-bit converter resolution, single channel electrically isolated, supports HART protocol	104
X20cAO4622	X20 analog output module, coated, 4 outputs, ± 10 V or 0 to 20 mA / 4 to 20 mA, 13-bit converter resolution	101
X20cAO4632	X20 analog output module, coated, 4 outputs, ± 10 V or 0 to 20 mA, 16-bit converter resolution	102
X20cAO4632-1	X20 analog output module, coated, 4 outputs, ± 11 V or 0 to 22 mA, 16-bit converter resolution	102

Temperature measurement



Model number	Short description	Page
X20cAT4222	X20 temperature input module, coated, 4 inputs for resistance measurement, PT100, PT1000, resolution 0.1°C, 3-wire connections	105
X20cAT6402	X20 temperature input module, coated, 6 thermocouple inputs, Type J, K, N, S, B, R, resolution 0.1°C	107

Motor control



Model number	Short description	Page
X20cMM2436	X20 PWM motor module, coated, 24 to 39 VDC $\pm 25\%$, 2 PWM motor bridges, 3 A continuous current, 3.5 A peak current, 4 digital inputs 24 VDC, sink, configurable as incremental encoder	109

Additional functions



Model number	Short description	Page
X20cPD2113	X20 potential distributor, coated, 6x GND, 6x 24 VDC, with supply option, integrated microfuse	121

Counter functions



Model number	Short description	Page
X20cDC1198	X20 digital counter module, coated, 1 SSI absolute encoder, 5 V, 1 Mbit/s, 32-bit	123
X20cDC1396	X20 digital counter module, coated, 1 ABR incremental encoder, 24 V, 100 kHz input frequency, 4x evaluation	125
X20cDC2395	X20 digital counter module, coated, 1 SSI absolute encoder, 24 V, 1 ABR incremental encoder, 24 V, 2 AB incremental encoders, 24 V, 4 event counters or 2 PWM, local time measurement function	126

Digital signal processing and preparation



Model number	Short description	Page
X20cDS1119	X20 multifunctional digital signal processor, coated, 3 digital channels 5 V (symmetric) configurable as inputs or outputs, 2 digital input channels 24 V (asymmetric), max. 2 event counters, 1 universal counter pair configurable as A/B or up/down counter, linear movement generator (A/B, direction/frequency) with 1 reference pulse, 1 SSI absolute encoder, NetTime module	133

reACTION technology modules



Model number	Short description	Page
X20cCP1382-RT	X20 CPU, coated, with integrated I/O, x86-400, 256 MB DDR3 RAM, 32 kB FRAM, 2 GB flash drive on board, 1 insert slot for X20 interface modules, 2 USB interfaces, 1 RS232 interface, 1 CAN bus interface, 1 POWERLINK interface, 1 Ethernet interface 10/100 Base-T, 14 digital inputs, 24 VDC, sink, 4 digital inputs, 2 μ s, 24 VDC, sink, 4 digital outputs, 24 VDC, 0.5 A, source, 4 digital outputs, 2 μ s, 24 VDC, 0.2 A, 4 digital inputs/outputs, 24 VDC, 0.5 A, 2 analog inputs \pm 10 V or 0 to 20 mA / 4 to 20 mA, 1 PT1000 instead of an analog input, including supply module, 3x X20TB1F terminal blocks, slot cover and X20AC0SR1 locking plate (right) included	139





X67 system

Remote I/O with IP67 protection












Mount, connect and ready to go: remote I/O directly on the machine. I/O in a credit card format requires very little installation space and no space at all in the control cabinet. The X67 system with IP67 protection meets the absolute highest demands, is as fast as a centralized solution and can communicate over open fieldbuses.

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Product overview

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System features

Remote I/O technology with IP67 protection

Traditional I/O systems are located centrally in the control cabinet, with extensive wiring required for sensors and actuators. In addition, modular machine designs often require intermediate connections with multi-pin connectors. Remote I/O modules can only reach their full potential, however, if additional distribution boxes can be eliminated completely. This is why the optimal solution has to include I/O modules with robust IP67 protection that can be placed directly in harsh industrial environments.

Reduced costs

Reduced wiring

Instead of tediously wiring each individual sensor or actuator to the control cabinet over long distances, with the X67 system all you need is a single bus cable and a 24 VDC power supply. This applies to the entire machine. The potential for savings is substantial, even when compared to passive distributors, since connecting a sensor to the X67 system replaces all of the input wiring to the control cabinet.

The shortest commissioning times

Pre-assembled standard cables make it possible for the mechanic to make the necessary connections himself and make wiring errors a thing of the past. Commissioning can begin immediately when machine construction is started, with time-consuming inspection of the wiring no longer necessary.

Minimized service costs

Correcting errors is a snap with individual sensors and actuators that can be unplugged and replaced quickly, as well as extensive diagnostic functions that allow errors to be detected immediately.

Flexibility

One system for all machine designs

Whether a compact machine or a large plant, this I/O system can be adapted to the machine's architecture to meet every demand for every level of performance. The X67 system offers ultimate design freedom.

Open communication

POWERLINK, CAN bus, CANopen, DeviceNet, PROFIBUS DP, EtherNet/IP, EtherCAT or Modbus TCP/UDP – the fieldbus system may change but the X67 I/O system from B&R always remains the same.

Unlimited expansion possibilities

The X67 system is extremely flexible, handling removable machine modules, optional expansions and even future upgrades to the machine architecture with ease.

Minimum control cabinet space

This system opens up the space normally needed for laying cables or placing terminals, I/O modules or additional distribution boxes.

ETHERNET 
POWERLINK



EtherCAT 



CANopen



X67 stands for: extremely compact, extremely robust and extremely fast



Open

X67 is an I/O solution for all standard fieldbus systems and for direct connections to B&R controllers. The fieldbus may change, but the I/O system always remains the same.



Compact

Optimal ergonomics and an extremely compact design allow the X67 system to fit anywhere on the machine.



Flexible

100 m between modules without restrictions provides more than enough room for reserves, making it easy to set up a configuration even when modules are far apart.



Fast

Cycle times well below a millisecond also guarantee the necessary reserves for your application. Synchronous I/O processing goes without saying.



Safe

Communication and I/O are completely isolated electrically. Disturbances or voltage dips on the I/O side do not affect the bus. Performing diagnostics is always possible.



Powerful

I/O power via two pairs of leads provides up to 8 amps for outputs or supplies additional modules.



Shielded

Seamless 360° shield grounding from the cable over the connector directly on the threading of the M12 connector, through to the metal backplane of the module and over the mounting screws straight to the machine provides a complete ground connection for all bus and analog signals.



Centered

The central position of the two mounting screws prevents misalignment of the housing in standard aluminum frames with wedge nut installations.



Adaptable

Digital channels that can be configured as inputs or outputs allow the solution to be tailored to the requirements and reduce the total number and variety of modules needed.



Unmistakable

Visual status indicators on the modules and advanced status messages via the bus enable clear-cut diagnostics. Warning and error thresholds for I/O supply, single-channel diagnostics and open line detection are just a few examples.



Robust

These completely sealed modules are the epitome of robustness, with features for maximizing electromagnetic immunity hidden inside.



Plug-and-run

Pre-assembled standard cables and automatic module identification reduce installation and commissioning work to an absolute minimum.



Protected

These systems are equipped with integrated reverse polarity protection, short circuit protection, protection when switching inductances and the highest level of protection for the electronics as well.



Integrated supply

Many sensors and actuators require a 24 VDC power supply. With X67 modules, this is integrated in all digital connections and also provides protection against short circuits.



Expandable

X67 systems can be expanded to include up to 250 modules with up to 100 m between them.



Multi-talented

Synchronous I/O processing, adjustable software filters, integrated counter functions, flexible standard functions – these are just a few of the X67 system's many advantages.

Bus controllers

X67BC4321-1, X67BC4321-10, X67BC4321.L08-1, X67BC4321.L08-10, X67BC4321.L12-10



Short description	X67BC4321-1	X67BC4321-10	X67BC4321.L08-1	X67BC4321.L08-10	X67BC4321.L12-10
Bus controller			CANopen		
General information	X67BC4321-1	X67BC4321-10	X67BC4321.L08-1	X67BC4321.L08-10	X67BC4321.L12-10
Inputs/Outputs	8 digital channels, configurable as inputs or outputs using software, inputs with additional functions	8 digital channels, configurable as inputs or outputs using software, inputs with additional functions	16 digital channels, configurable as inputs or outputs using software, inputs with additional functions	16 digital channels, configurable as inputs or outputs using software, inputs with additional functions	16 digital channels, configurable as inputs or outputs using software, inputs with additional functions
Nominal voltage	24 VDC				
Sensor/Actuator supply	0.5 A summation current				
Connection type					
Fieldbus	M12, A-keyed				
X2X Link	M12, B-keyed				
Inputs/Outputs	8x M8, 3-pin	8x M8, 3-pin	16x M8, 3-pin	16x M8, 3-pin	8x M12, A-keyed
I/O supply	M8, 4-pin				
Power output	3 W X2X Link power supply for I/O modules	3 W X2X Link power supply for I/O modules	3 W X2X Link power supply for I/O modules	15 W X2X Link power supply for I/O modules	15 W X2X Link power supply for I/O modules
Power consumption					
Fieldbus	3.8 W	2 W	5.4 W	2.11 W	2.11 W
Internal I/O	-	2.1 W	-	3.71 W	3.71 W
X2X Link supply	5.5 W at maximum power output for connected I/O modules	6 W at maximum power output for connected I/O modules	9.79 W at maximum power output for connected I/O modules	21.59 W at maximum power output for connected I/O modules	21.59 W at maximum power output for connected I/O modules
Certification					
CE	Yes				
cULus	Yes				
ATEX Zone 2 ¹⁾	Yes	Yes	-	-	-
KC	Yes				
GOST-R	Yes				
Interfaces	X67BC4321-1	X67BC4321-10	X67BC4321.L08-1	X67BC4321.L08-10	X67BC4321.L12-10
Fieldbus	CANopen				
Design	M12 interface (male connector on the module)	M12 interface (male connector on the module)	2x M12 interface for the Y-connector integrated in the module	2x M12 interface for the Y-connector integrated in the module	2x M12 interface for the Y-connector integrated in the module
Max. distance	1000 m				
Transfer rate	Max. 1 Mbit/s				
Default transfer rate	Automatic transfer rate detection				
Min. cycle time ²⁾					
Fieldbus	No limitations				
X2X Link	400 µs	500 µs	400 µs	500 µs	500 µs
Synchronization between bus systems possible	No	No	No	No	No
Terminating resistor	Can be optionally screwed onto the Y-connector	Can be optionally screwed onto the Y-connector	-	-	-

Note: Product photos are not shown to scale.

X67BC4321-1, X67BC4321-10, X67BC4321.L08-1, X67BC4321.L08-10, X67BC4321.L12-10

Digital inputs	X67BC4321-1	X67BC4321-10	X67BC4321.L08-1	X67BC4321.L08-10	X67BC4321.L12-10
Input filter					
Hardware	≤10 µs (channels 1 to 4) ≤70 µs (channels 5 to 8)	≤10 µs (channels 1 to 4) ≤70 µs (channels 5 to 8)	≤10 µs (Channels 1 to 4) ≤70 µs (Channels 5 to 16)	≤10 µs (Channels 1 to 4) ≤70 µs (Channels 5 to 16)	≤10 µs (Channels 1 to 4) ≤70 µs (Channels 5 to 16)
Software	Default 0 ms, configurable between 0 and 25 ms in 0.1 ms intervals	Default 0 ms, configurable between 0 and 25 ms in 0.1 ms intervals	Default 0 ms, configurable between 0 and 25 ms in 0.2 ms intervals	Default 0 ms, configurable between 0 and 25 ms in 0.2 ms intervals	Default 0 ms, configurable between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink				
Additional functions	50 kHz event counting, gate measurement				
Event counter	X67BC4321-1	X67BC4321-10	X67BC4321.L08-1	X67BC4321.L08-10	X67BC4321.L12-10
Quantity	2				
Signal form	Square wave pulse				
Evaluation	Each falling edge, cyclic counter				
Input frequency	Max. 50 kHz				
Counter size	16-bit				
Gate measurement	X67BC4321-1	X67BC4321-10	X67BC4321.L08-1	X67BC4321.L08-10	X67BC4321.L12-10
Quantity	1				
Signal form	Square wave pulse				
Evaluation	Rising edge - Falling edge				
Counter frequency	48 MHz, 3 MHz, 187.5 kHz				
Internal					
Counter size	16-bit				
Digital outputs	X67BC4321-1	X67BC4321-10	X67BC4321.L08-1	X67BC4321.L08-10	X67BC4321.L12-10
Design	FET positive switching				
Nominal output current	0.5 A				
Total nominal current	4 A	4 A	8 A	8 A	8 A
Output circuit	Source				
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply				
Environmental conditions	X67BC4321-1	X67BC4321-10	X67BC4321.L08-1	X67BC4321.L08-10	X67BC4321.L12-10
Temperature					
Operation	0 to 60°C	-25 to 60°C	0 to 60°C	-25 to 60°C	-25 to 60°C
Derating					
Mechanical characteristics	X67BC4321-1	X67BC4321-10	X67BC4321.L08-1	X67BC4321.L08-10	X67BC4321.L12-10
Dimensions					
Width			53 mm		
Height	85 mm	85 mm	155 mm	155 mm	155 mm
Depth			42 mm		

¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

²⁾ The minimum cycle time defines how far the bus cycle can be reduced without communication errors occurring.

X67BC5321



Short description

Bus controller	DeviceNet adapter
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General information

Inputs/Outputs	8 digital channels, configurable as inputs or outputs using software, inputs with additional functions
Nominal voltage	24 VDC
Sensor/Actuator supply	0.5 A summation current
Connection type	
Fieldbus	M12, A-keyed
X2X Link	M12, B-keyed
Inputs/Outputs	8x M8, 3-pin
I/O supply	M8, 4-pin
Power output	3 W X2X Link power supply for I/O modules
Power consumption	
Fieldbus	2.7 W
Internal I/O	2 W
X2X Link supply	6.6 W at maximum power output for connected I/O modules
Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GOST-R	Yes

Interfaces

Fieldbus	DeviceNet adapter
Design	M12 interface (male connector on the module)
Max. distance	500 m
Transfer rate	Max. 500 kbit/s
Default transfer rate	Automatic transfer rate detection
Min. cycle time ²⁾	
Fieldbus	No limitations
X2X Link	400 µs
Synchronization between bus systems possible	No
Terminating resistor	Can be optionally screwed onto the Y-connector

Digital inputs

Input filter	
Hardware	≤10 µs (channels 1 to 4) / ≤70 µs (channels 5 to 8)
Software	Default 0 ms, configurable between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions	50 kHz event counting, gate measurement

Event counter

Quantity	2
Signal form	Square wave pulse
Evaluation	Each falling edge, cyclic counter
Input frequency	Max. 50 kHz
Counter size	16-bit

Gate measurement

Quantity	1
Signal form	Square wave pulse
Evaluation	Rising edge - Falling edge
Counter frequency	
Internal	48 MHz, 3 MHz, 187.5 kHz
Counter size	16-bit

X67BC5321

Digital outputs

Design	FET positive switching
Nominal output current	0.5 A
Total nominal current	4 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply

Environmental conditions

Temperature	
Operation	-25 to 60°C
Derating	-

Mechanical characteristics

Dimensions	
Width	53 mm
Height	85 mm
Depth	42 mm

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ The minimum cycle time defines how far the bus cycle can be reduced without communication errors occurring.

Bus controllers

X67BC6321, X67BC6321.L08, X67BC6321.L12



Short description	X67BC6321	X67BC6321.L08	X67BC6321.L12
Bus controller		PROFIBUS DP V0	
General information	X67BC6321	X67BC6321.L08	X67BC6321.L12
Inputs/Outputs	8 digital channels, configurable as inputs or outputs using software, inputs with additional functions	16 digital channels, configurable as inputs or outputs using software, inputs with additional functions	16 digital channels, configurable as inputs or outputs using software, inputs with additional functions
Nominal voltage		24 VDC	
Sensor/Actuator supply		0.5 A summation current	
Connection type			
Fieldbus		M12, B-keyed	
X2X Link		M12, B-keyed	
Inputs/Outputs	8x M8, 3-pin	16x M8, 3-pin	8x M12, A-keyed
I/O supply		M8, 4-pin	
Power output	3 W X2X Link power supply for I/O modules	15 W X2X Link power supply for I/O modules	15 W X2X Link power supply for I/O modules
Power consumption			
Fieldbus	3.8 W	3.25 W	3.25 W
Internal I/O	2 W	2.04 W	2.04 W
X2X Link supply	7.5 W at maximum power output for connected I/O modules	23.63 W at maximum power output for connected I/O modules	23.63 W at maximum power output for connected I/O modules
Certification			
CE		Yes	
cULus		Yes	
ATEX Zone 2 ¹⁾		Yes	
KC		Yes	
GOST-R		Yes	
Interfaces	X67BC6321	X67BC6321.L08	X67BC6321.L12
Fieldbus		PROFIBUS DP V0	
Design	M12 interface (female connector on the module)	2x M12 interface for the Y-connector integrated in the module	2x M12 interface for the Y-connector integrated in the module
Max. distance		1200 m	
Transfer rate		Max. 12 Mbit/s	
Default transfer rate		Automatic transfer rate detection	
Controller	-	-	VPC3+C
Min. cycle time ²⁾			
Fieldbus		No limitations	
X2X Link		400 µs	
Synchronization between bus systems possible		No	
Terminating resistor		Can be optionally screwed onto the Y-connector	

Note: Product photos are not shown to scale.

X67BC6321, X67BC6321.L08, X67BC6321.L12

Digital inputs	X67BC6321	X67BC6321.L08	X67BC6321.L12
Input filter			
Hardware	≤10 µs (channels 1 to 4) ≤70 µs (channels 5 to 8)	≤10 µs (Channels 1 to 4) ≤70 µs (Channels 5 to 16)	≤10 µs (Channels 1 to 4) ≤70 µs (Channels 5 to 16)
Software	Default 0 ms, configurable between 0 and 25 ms in 0.2 ms intervals		
Input circuit	Sink		
Additional functions	50 kHz event counting, gate measurement		
Event counter	X67BC6321	X67BC6321.L08	X67BC6321.L12
Quantity	2		
Signal form	Square wave pulse		
Evaluation	Each falling edge, cyclic counter		
Input frequency	Max. 50 kHz		
Counter size	16-bit		
Gate measurement	X67BC6321	X67BC6321.L08	X67BC6321.L12
Quantity	1		
Signal form	Square wave pulse		
Evaluation	Rising edge - Falling edge		
Counter frequency	48 MHz, 3 MHz, 187.5 kHz		
Internal			
Counter size	16-bit		
Digital outputs	X67BC6321	X67BC6321.L08	X67BC6321.L12
Design	FET positive switching		
Nominal output current	0.5 A		
Total nominal current	4 A	8 A	8 A
Output circuit	Source		
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply		
Environmental conditions	X67BC6321	X67BC6321.L08	X67BC6321.L12
Temperature			
Operation	-25 to 60°C		
Derating	-		
Mechanical characteristics	X67BC6321	X67BC6321.L08	X67BC6321.L12
Dimensions			
Width		53 mm	
Height	85 mm	155 mm	155 mm
Depth		42 mm	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ The minimum cycle time defines how far the bus cycle can be reduced without communication errors occurring.

X67BC7321-1



Short description

Bus controller	CAN I/O
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General information

Inputs/Outputs	8 digital channels, configurable as inputs or outputs using software, inputs with additional functions
Nominal voltage	24 VDC
Sensor/Actuator supply	0.5 A summation current
Connection type	
Fieldbus	M12, A-keyed
X2X Link	M12, B-keyed
Inputs/Outputs	8x M8, 3-pin
I/O supply	M8, 4-pin
Power output	3 W X2X Link power supply for I/O modules
Power consumption	
Fieldbus	2.1 W
Internal I/O	2 W
X2X Link supply	6.2 W at maximum power output for connected I/O modules
Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GOST-R	Yes

Interfaces

Fieldbus	CAN I/O
Design	M12 interface (male connector on the module)
Max. distance	1000 m
Transfer rate	Max. 1 Mbit/s
Default transfer rate	Automatic transfer rate detection
Min. cycle time ²⁾	
Fieldbus	1 ms
X2X Link	1 ms
Synchronization between bus systems possible	No
Terminating resistor	Can be optionally screwed onto the Y-connector

Digital inputs

Input filter	
Hardware	≤10 μs (channels 1 to 4) / ≤70 μs (channels 5 to 8)
Software	Default 0 ms, configurable between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions	50 kHz event counting, gate measurement

Event counter

Quantity	2
Signal form	Square wave pulse
Evaluation	Each falling edge, cyclic counter
Input frequency	Max. 50 kHz
Counter size	16-bit

Gate measurement

Quantity	1
Signal form	Square wave pulse
Evaluation	Rising edge - Falling edge
Counter frequency	
Internal	48 MHz, 3 MHz, 187.5 kHz
Counter size	16-bit

X67BC7321-1

Digital outputs

Design	FET positive switching
Nominal output current	0.5 A
Total nominal current	4 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply

Environmental conditions

Temperature	
Operation	-25 to 60°C
Derating	-

Mechanical characteristics

Dimensions	
Width	53 mm
Height	85 mm
Depth	42 mm

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ The minimum cycle time defines how far the bus cycle can be reduced without communication errors occurring.

Bus controllers

X67BC8321-1, X67BC8321.L12, X67BC8331, X67BC8513.L12



Short description	X67BC8321-1	X67BC8321.L12	X67BC8331	X67BC8513.L12
Bus controller			POWERLINK (V1/V2) controlled node	
General information	X67BC8321-1	X67BC8321.L12	X67BC8331	X67BC8513.L12
Inputs/Outputs	8 digital channels, configurable as inputs or outputs using software, inputs with additional functions	16 digital channels, configurable as inputs or outputs using software, inputs with additional functions	8 digital channels, configurable as inputs or outputs using software, inputs with additional functions	12 digital channels (configurable as inputs or outputs using software, inputs with additional functions), 1 analog channel
Nominal voltage	24 VDC			
Sensor/Actuator supply	0.5 A summation current			
Connection type			M12, D-keyed M12, B-keyed	
Fieldbus				
X2X Link				
Inputs/Outputs	8x M8, 3-pin	8x M12, A-keyed	8x M8, 3-pin	8x M12, A-keyed
I/O supply			M8, 4-pin	
Power output	3 W X2X Link power supply for I/O modules	15 W X2X Link power supply for I/O modules	3 W X2X Link power supply for I/O modules	Max. 15 W X2X Link supply for additional I/O modules
Power consumption				
Fieldbus	3.5 W	4.2 W	3.5 W	2.5 W
Internal I/O	2.5 W	2.5 W	3.8 W	0.6 W
X2X Link supply	4.2 W at maximum power output for connected I/O modules	24.3 W at maximum power output for connected I/O modules	4.2 W at maximum power output for connected I/O modules	17.25 W at maximum power output for connected I/O modules
Certification				
CE			Yes	
cULus			Yes	
ATEX Zone 2 ¹⁾	Yes	-	Yes	-
KC			Yes	
GOST-R			Yes	
Interfaces	X67BC8321-1	X67BC8321.L12	X67BC8331	X67BC8513.L12
Fieldbus	POWERLINK (V1/V2) controlled node			
Design	M12 interface (female connector on the module)	2x M12 interface (hub), 2x female connector on the module	M12 interface (female connector on the module)	2x M12 interface (hub), 2x female connector on the module
Cable length	Max. 100 m between two stations (segment length)			
Transfer rate	100 Mbit/s			
Transmission				
Physical layer			100BASE-TX	
Half-duplex			Yes	
Full-duplex			No	
Autonegotiation			Yes	
Auto-MDI / MDIX			Yes	
Hub runtime	-	0.96 to 1 µs	-	0.96 to 1 µs
Min. cycle time ²⁾				
Fieldbus			200 µs	
X2X Link			200 µs	
Synchronization between bus systems possible			Yes	

Note: Product photos are not shown to scale.

X67BC8321-1, X67BC8321.L12, X67BC8331, X67BC8513.L12

Digital inputs	X67BC8321-1	X67BC8321.L12	X67BC8331	X67BC8513.L12
Input filter				
Hardware	≤10 µs (channels 1 to 4) ≤70 µs (channels 5 to 8)	≤10 µs (Channels 1 to 4) ≤70 µs (Channels 5 to 16)	≤10 µs (channels 1 to 4) ≤70 µs (channels 5 to 8)	≤10 µs (Channels 1 to 4) ≤70 µs (Channels 5 to 12)
Software	Default 0 ms, configurable between 0 and 25 ms in 0.2 ms intervals			
Input circuit				Sink
Additional functions	50 kHz event counting, gate measurement	50 kHz event counting, gate measurement	-	50 kHz event counting, gate measurement
Event counter	X67BC8321-1	X67BC8321.L12	X67BC8331	X67BC8513.L12
Quantity	2	2	-	1
Signal form	Square wave pulse	Square wave pulse	-	Square wave pulse
Evaluation	Each falling edge, cyclic counter	Each falling edge, cyclic counter	-	Each falling edge, cyclic counter
Input frequency	Max. 50 kHz	Max. 50 kHz	-	Max. 50 kHz
Counter size	16-bit	16-bit	-	16-bit
Gate measurement	X67BC8321-1	X67BC8321.L12	X67BC8331	X67BC8513.L12
Quantity	1	1	-	1
Signal form	Square wave pulse	Square wave pulse	-	Square wave pulse
Evaluation	Rising edge - Falling edge	Rising edge - Falling edge	-	Rising edge - Falling edge
Counter frequency				
Internal	48 MHz, 3 MHz, 187.5 kHz	48 MHz, 3 MHz, 187.5 kHz	-	48 MHz, 3 MHz, 187.5 kHz
Counter size	16-bit	16-bit	-	16-bit
Analog inputs	X67BC8321-1	X67BC8321.L12	X67BC8331	X67BC8513.L12
Input	-	-	-	0 to 20 mA
Input type	-	-	-	Differential input
Digital converter resolution	-	-	-	12-bit
Conversion time	-	-	-	200 µs
Output format	-	-	-	INT
Load	-	-	-	<300 Ω
Input protection	-	-	-	Protection against wiring with supply voltage
Max. error at 25°C				
Gain	-	-	-	0.1% ³⁾
Offset	-	-	-	0.05% ⁴⁾
Digital outputs	X67BC8321-1	X67BC8321.L12	X67BC8331	X67BC8513.L12
Design	FET positive switching			
Nominal output current	0.5 A	0.5 A	2 A	0.5 A
Total nominal current	4 A	8 A	8 A	8 A
Output circuit	Source			
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply			
Environmental conditions	X67BC8321-1	X67BC8321.L12	X67BC8331	X67BC8513.L12
Temperature				
Operation	-25 to 60°C			
Derating	-			
Mechanical characteristics	X67BC8321-1	X67BC8321.L12	X67BC8331	X67BC8513.L12
Dimensions				
Width			53 mm	
Height	85 mm	155 mm	85 mm	155 mm
Depth			42 mm	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ The minimum cycle time defines how far the bus cycle can be reduced without communication errors occurring.

³⁾ Based on the current measured value.

⁴⁾ Based on the entire measurement range.

Bus controllers

X67BCD321.L12, X67BCE321.L12, X67BCG321.L12, X67BCJ321, X67BCJ321.L12



Short description	X67BCD321.L12	X67BCE321.L12	X67BCG321.L12	X67BCJ321	X67BCJ321.L12
Bus controller	EtherNet/IP Adapter (slave)	PROFINET RT slave	EtherCAT	Modbus TCP/UDP slave	Modbus TCP/UDP slave
General information	X67BCD321.L12	X67BCE321.L12	X67BCG321.L12	X67BCJ321	X67BCJ321.L12
Inputs/Outputs	16 digital channels, configurable as inputs or outputs using FieldbusDESIGNER or data point, inputs with additional functions	16 digital channels, configurable as inputs or outputs using software, inputs with additional functions	16 digital channels, configurable as inputs or outputs using FieldbusDESIGNER or data point, inputs with additional functions	8 digital channels, configurable as inputs or outputs using FieldbusDESIGNER or data point, inputs with additional functions	16 digital channels, configurable as inputs or outputs using FieldbusDESIGNER or data point, inputs with additional functions
Nominal voltage	24 VDC				
Sensor/Actuator supply	0.5 A summation current				
Connection type					
Fieldbus					
X2X Link					
Inputs/Outputs	8x M12, A-keyed	8x M12, A-keyed	8x M12, A-keyed	8x M8, 3-pin	8x M12, A-keyed
I/O supply	M8, 4-pin				
Power output	15 W X2X Link power supply for I/O modules	15 W X2X Link power supply for I/O modules	Max. 15 W X2X Link supply for additional I/O modules	3 W X2X Link power supply for I/O modules	15 W X2X Link power supply for I/O modules
Power consumption					
Fieldbus	2.5 W	4.2 W	2.5 W	3.5 W	4.2 W
Internal I/O	3.3 W	2.5 W	0.5 W	2.5 W	2.5 W
X2X Link supply	20.5 W at maximum power output for connected I/O modules	24.3 W at maximum power output for connected I/O modules	15% of the power output for X2X Link	4.2 W at maximum power output for connected I/O modules	24.3 W at maximum power output for connected I/O modules
Additional power dissipation caused by the actuators (resistive) [W]	-	-	0.6	-	-
Certification					
CE	Yes				
cULus	Yes				
ATEX Zone 2 ¹⁾	-	-	-	Yes	-
KC	Yes	-	Yes	Yes	Yes
GOST-R	Yes				
Interfaces	X67BCD321.L12	X67BCE321.L12	X67BCG321.L12	X67BCJ321	X67BCJ321.L12
Fieldbus	EtherNet/IP Adapter (slave)	PROFINET RT slave	EtherCAT slave	Modbus TCP/UDP slave	Modbus TCP/UDP slave
Design	2x M12 interface (switch), 2x female connector on the module	2x M12 interface (switch), 2x female connector on the module	M12 interface (female) 2x on the module	M12 interface (female connector on the module)	2x M12 interface (switch), 2x female connector on the module
Cable length	Max. 100 m between two stations (segment length)				
Transfer rate	10/100 Mbit/s	100 Mbit/s	100 Mbit/s	10/100 Mbit/s	10/100 Mbit/s
Transmission					
Physical layer	10 BASE-T/100 BASE-TX	100BASE-TX	100BASE-TX	10 BASE-T/100 BASE-TX	10 BASE-T/100 BASE-TX
Half-duplex	Yes				
Full-duplex	Yes				
Autonegotiation	Yes				
Auto-MDI / MDIX	Yes				

Note: Product photos are not shown to scale.

X67BCD321.L12, X67BCE321.L12, X67BCG321.L12, X67BCJ321, X67BCJ321.L12

Hub runtime	-	-	750 ns	-	-
Min. cycle time ²⁾					
Fieldbus	1 ms	1 ms	200 µs	1 ms	1 ms
X2X Link	500 µs	250 µs	200 µs	500 µs	500 µs
Synchronization between bus systems possible	No	Yes	Yes	No	No
Digital inputs	X67BCD321.L12	X67BCE321.L12	X67BCG321.L12	X67BCJ321	X67BCJ321.L12
Input filter					
Hardware	≤10 µs (channels 1 to 4) ≤70 µs (channels 5 to 8)	≤10 µs (Channels 1 to 4) ≤70 µs (Channels 5 to 16)	≤10 µs (Channels 1 to 4) ≤70 µs (Channels 5 to 16)	≤10 µs (channels 1 to 4) ≤70 µs (channels 5 to 8)	≤10 µs (Channels 1 to 4) ≤70 µs (Channels 5 to 16)
Software	Default 0 ms, configurable between 0 and 25 ms in 0.2 ms intervals				
Input circuit	Sink				
Additional functions	50 kHz event counting, gate measurement				
Event counter	X67BCD321.L12	X67BCE321.L12	X67BCG321.L12	X67BCJ321	X67BCJ321.L12
Quantity	2				
Signal form	Square wave pulse				
Evaluation	Each falling edge, cyclic counter				
Input frequency	Max. 50 kHz				
Counter size	16-bit				
Gate measurement	X67BCD321.L12	X67BCE321.L12	X67BCG321.L12	X67BCJ321	X67BCJ321.L12
Quantity	1				
Signal form	Square wave pulse				
Evaluation	Rising edge - Falling edge				
Counter frequency					
Internal	48 MHz, 3 MHz, 187.5 kHz				
Counter size	16-bit				
Digital outputs	X67BCD321.L12	X67BCE321.L12	X67BCG321.L12	X67BCJ321	X67BCJ321.L12
Design	FET positive switching				
Nominal output current	0.5 A				
Total nominal current	8 A	8 A	8 A	4 A	8 A
Output circuit	Source				
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply				
R _{DS(on)}	-	-	150 mΩ	-	-
Environmental conditions	X67BCD321.L12	X67BCE321.L12	X67BCG321.L12	X67BCJ321	X67BCJ321.L12
Temperature					
Operation	-25 to 60°C				
Derating	-				
Mechanical characteristics	X67BCD321.L12	X67BCE321.L12	X67BCG321.L12	X67BCJ321	X67BCJ321.L12
Dimensions					
Width	53 mm				
Height	155 mm	155 mm	155 mm	85 mm	155 mm
Depth	42 mm				

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ The minimum cycle time defines how far the bus cycle can be reduced without communication errors occurring.

System power supply

X67PS1300



Short description

System power supply modules	Electrically isolated X2X Link supply
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General information

Connection type	
X2X Link supply output	M12, B-keyed
X2X Link input supply	M8, 4-pin
Power consumption	
Internal	3 W
Electrical isolation	
X2X Link feed - X2X Link supply	Yes
Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GOST-R	Yes

X2X Link input supply

Nominal voltage	24 VDC
Voltage range	18 to 30 VDC
Nominal current	0.75 A
Fuse	integrated

X2X Link supply output

Nominal voltage	20 VDC
Nominal output power	15 W
Parallel operation	Yes
Redundant operation	Yes, when input voltages are the same
Overload behavior	Short circuit protection, overload protection

Environmental conditions

Temperature	
Operation	-25 to 60°C
Derating	-

Mechanical characteristics

Dimensions	
Width	53 mm
Height	85 mm
Depth	42 mm

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Digital inputs

X67DI1371, X67DI1371.L08, X67DI1371.L12, X67DI1372



Short description	X67DI1371	X67DI1371.L08	X67DI1371.L12	X67DI1372
I/O module	8 digital inputs 24 VDC	16 digital inputs 24 VDC	16 digital inputs 24 VDC	8 digital inputs 24 VDC
General information	X67DI1371	X67DI1371.L08	X67DI1371.L12	X67DI1372
Connection type				
X2X Link			M12, B-keyed	
Inputs	8x M8, 3-pin	16x M8, 3-pin	8x M12, A-keyed	8x M8, 3-pin
I/O supply			M8, 4-pin	
Power consumption				
Internal I/O	1 W	0.5 W	0.5 W	0.6 W
X2X Link supply			0.75 W	
Certification				
CE			Yes	
cULus			Yes	
ATEX Zone 2 ¹⁾	Yes	Yes	Yes	-
KC			Yes	
GOST-R			Yes	
Digital inputs	X67DI1371	X67DI1371.L08	X67DI1371.L12	X67DI1372
Nominal voltage			24 VDC	
Input filter				
Hardware			≤100 μs	
Software			1 ms	
Input circuit	Sink	Sink	Sink	Source
Sensor supply			0.5 A summation current	
Environmental conditions	X67DI1371	X67DI1371.L08	X67DI1371.L12	X67DI1372
Temperature				
Operation			-25 to 60°C	
Derating			-	
Mechanical characteristics	X67DI1371	X67DI1371.L08	X67DI1371.L12	X67DI1372
Dimensions				
Width			53 mm	
Height	85 mm	155 mm	155 mm	85 mm
Depth			42 mm	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Note: Product photos are not shown to scale.

Digital outputs

X67DO1332, X67DO9332.L12



Short description	X67DO1332	X67DO9332.L12	
I/O module		8 digital outputs 24 VDC	
General information	X67DO1332	X67DO9332.L12	
Connection type		M12, B-keyed	
X2X Link			
Outputs	8x M8, 3-pin	8x M12, A-keyed	
I/O supply		M8, 4-pin	
Power consumption			
Internal I/O	2 W	1.7 W	
X2X Link supply		0.75 W	
Certification			
CE		Yes	
cULus		Yes	
ATEX Zone 2 ¹⁾		Yes	
KC		Yes	
GOST-R		Yes	
Digital outputs	X67DO1332	X67DO9332.L12	
Design		FET positive switching	
Quantity	8 ²⁾	8	
Nominal voltage		24 VDC	
Nominal output current		2 A	
Total nominal current		8 A	
Output circuit		Source	
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply		
Actuator supply	0.5 A summation current	-	
Actuator supply			
Actuator current	-	0.1 A	
Total nominal current	-	0.5 A	
Environmental conditions	X67DO1332	X67DO9332.L12	
Temperature			
Operation		-25 to 60°C	
Derating		-	
Mechanical characteristics	X67DO1332	X67DO9332.L12	
Dimensions			
Width		53 mm	
Height	85 mm	155 mm	
Depth		42 mm	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ In 2 groups of 4 channels each

Note: Product photos are not shown to scale.

Digital inputs and outputs

X67DM1321, X67DM1321.L08, X67DM1321.L12



Short description	X67DM1321	X67DM1321.L08	X67DM1321.L12
I/O module	8 digital channels, configurable as inputs or outputs using software, inputs with additional functions	16 digital channels, configurable as inputs or outputs using software, inputs with additional functions	16 digital channels, configurable as inputs or outputs using software, inputs with additional functions
General information	X67DM1321	X67DM1321.L08	X67DM1321.L12
Nominal voltage		24 VDC	
Sensor/Actuator supply		0.5 A summation current	
Connection type		M12, B-keyed	
X2X Link			
Inputs/Outputs	8x M8, 3-pin	16x M8, 3-pin	8x M12, A-keyed
I/O supply		M8, 4-pin	
Power consumption			
Internal I/O	2.5 W	3 W	3 W
X2X Link supply		0.75 W	
Certification			
CE		Yes	
cULus		Yes	
ATEX Zone 2 ¹⁾		Yes	
KC		Yes	
GOST-R		Yes	
Digital inputs	X67DM1321	X67DM1321.L08	X67DM1321.L12
Input filter			
Hardware	≤10 μs (channels 1 to 4) ≤70 μs (channels 5 to 8)	≤10 μs (Channels 1 to 4) ≤70 μs (Channels 5 to 16)	≤10 μs (Channels 1 to 4) ≤70 μs (Channels 5 to 16)
Software		Default 0 ms, configurable between 0 and 25 ms in 0.2 ms intervals	
Input circuit		Sink	
Additional functions		50 kHz event counting, gate measurement	
Event counter	X67DM1321	X67DM1321.L08	X67DM1321.L12
Quantity		2	
Signal form		Square wave pulse	
Evaluation		Each falling edge, cyclic counter	
Input frequency		Max. 50 kHz	
Counter size		16-bit	
Gate measurement	X67DM1321	X67DM1321.L08	X67DM1321.L12
Quantity		1	
Signal form		Square wave pulse	
Evaluation		Rising edge - Falling edge	
Counter frequency			
Internal		48 MHz, 3 MHz, 187.5 kHz	
Counter size		16-bit	

Note: Product photos are not shown to scale.

Digital inputs and outputs

X67DM1321, X67DM1321.L08, X67DM1321.L12

Digital outputs	X67DM1321	X67DM1321.L08	X67DM1321.L12
Design		FET positive switching	
Nominal output current		0.5 A	
Total nominal current	4 A	8 A	8 A
Output circuit		Source	
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply		
Environmental conditions	X67DM1321	X67DM1321.L08	X67DM1321.L12
Temperature			
Operation		-25 to 60°C	
Derating		-	
Mechanical characteristics	X67DM1321	X67DM1321.L08	X67DM1321.L12
Dimensions			
Width		53 mm	
Height	85 mm	155 mm	155 mm
Depth		42 mm	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X67DM9321, X67DM9321.L12, X67DM9331.L12



Short description	X67DM9321	X67DM9321.L12	X67DM9331.L12
I/O module	8 digital channels, configurable as inputs or outputs using software, inputs with additional functions	16 digital channels, configurable as inputs or outputs using software, inputs with additional functions	8 digital channels, configurable as inputs or outputs using software
General information	X67DM9321	X67DM9321.L12	X67DM9331.L12
Nominal voltage		24 VDC	
Sensor/Actuator supply	0.5 A summation current	0.5 A summation current	-
Sensor/Actuator supply			
Sensor/Actuator current	-	-	0.1 A
Summation current	-	-	0.5 A
Connection type			
X2X Link		M12, B-keyed	
Inputs/Outputs	8x M8, 3-pin	8x M12, A-keyed	8x M12, A-keyed
I/O supply		M8, 4-pin	
Power consumption			
Internal I/O	2.5 W	-	1.7 W
I/O supply	-	3 W	-
X2X Link supply		0.75 W	
Certification			
CE		Yes	
cULus		Yes	
ATEX Zone 2 ¹⁾	Yes	-	Yes
KC		Yes	
GOST-R		Yes	
Digital inputs	X67DM9321	X67DM9321.L12	X67DM9331.L12
Input filter			
Hardware	≤10 μs (channels 1 to 4) ≤70 μs (channels 5 to 8)	≤10 μs (Channels 1 to 4) ≤70 μs (Channels 5 to 16)	≤70 μs
Software		Default 0 ms, configurable between 0 and 25 ms in 0.2 ms intervals	
Input circuit		Sink	
Additional functions	50 kHz event counting, gate measurement	50 kHz event counting, gate measurement	-
Event counter	X67DM9321	X67DM9321.L12	X67DM9331.L12
Quantity	2	2	-
Signal form	Square wave pulse	Square wave pulse	-
Evaluation	Each falling edge, cyclic counter	Each falling edge, cyclic counter	-
Input frequency	Max. 50 kHz	Max. 50 kHz	-
Counter size	16-bit	16-bit	-

Note: Product photos are not shown to scale.

Digital inputs and outputs

X67DM9321, X67DM9321.L12, X67DM9331.L12

Gate measurement	X67DM9321	X67DM9321.L12	X67DM9331.L12
Quantity	1	1	-
Signal form	Square wave pulse	Square wave pulse	-
Evaluation	Rising edge - Falling edge	Rising edge - Falling edge	-
Counter frequency			
Internal	48 MHz, 3 MHz, 187.5 kHz	48 MHz, 3 MHz, 187.5 kHz	-
Counter size	16-bit	16-bit	-
Digital outputs	X67DM9321	X67DM9321.L12	X67DM9331.L12
Design		FET positive switching	
Nominal output current	0.5 A	0.5 A	2 A
Total nominal current	4 A	8 A	8 A
Output circuit		Source	
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply		
Environmental conditions	X67DM9321	X67DM9321.L12	X67DM9331.L12
Temperature			
Operation		-25 to 60°C	
Derating		-	
Mechanical characteristics	X67DM9321	X67DM9321.L12	X67DM9331.L12
Dimensions			
Width		53 mm	
Height	85 mm	155 mm	155 mm
Depth		42 mm	

¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

Digital valve control

X67DV1311.L08, X67DV1311.L12



Short description	X67DV1311.L08	X67DV1311.L12
I/O module	16 digital outputs for controlling valve terminals with multi-pin technology 16 digital inputs for feedback	
General information	X67DV1311.L08	X67DV1311.L12
Nominal voltage	24 VDC	
Connection type		
X2X Link	M12, B-keyed	
Outputs	M16, 19-pin	
Inputs	16x M8, 3-pin	8x M12, A-keyed
I/O supply	M8, 4-pin	
Power consumption		
Internal I/O	1.3 W	
X2X Link supply	0.75 W	
Certification		
CE	Yes	
cULus	Yes	
ATEX Zone 2 ¹⁾	Yes	-
KC	Yes	
GOST-R	Yes	
Digital inputs	X67DV1311.L08	X67DV1311.L12
Input filter		
Hardware	≤100 µs	
Software	Default 0 ms, configurable between 0 and 25 ms in 0.2 ms intervals	
Input circuit	Sink	
Sensor supply	0.5 A summation current	
Digital outputs	X67DV1311.L08	X67DV1311.L12
Design	FET positive switching	
Nominal output current	0.1 A	
Total nominal current	1.6 A	
Output circuit	Source	
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply	
Environmental conditions	X67DV1311.L08	X67DV1311.L12
Temperature		
Operation	-25 to 60°C	
Derating	-	
Mechanical characteristics	X67DV1311.L08	X67DV1311.L12
Dimensions		
Width	53 mm	
Height	155 mm	
Depth	42 mm	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Analog inputs

X67AI1223, X67AI1233



Short description	X67AI1223	X67AI1233
I/O module		4 analog inputs ± 10 V
General information	X67AI1223	X67AI1233
Connection type		M12, B-keyed
X2X Link		
Inputs		4x M12, A-keyed
I/O supply		M8, 4-pin
Power consumption		
Internal I/O		3 W
X2X Link supply		0.75 W
Certification		
CE		Yes
cULus		Yes
ATEX Zone 2 ¹⁾		Yes
KC		Yes
GOST-R		Yes
Analog inputs	X67AI1223	X67AI1233
Input		± 10 V
Input type		Differential input
Digital converter resolution	12-bit	16-bit
Conversion time		400 μ s for all inputs
Output format		INT
Input impedance in signal range		20 M Ω
Input protection		Protection against wiring with supply voltage
Max. error at 25°C		
Gain	0.1% ²⁾	0.12% ²⁾
Offset	0.05% ³⁾	0.06% ³⁾
Environmental conditions	X67AI1223	X67AI1233
Temperature		
Operation		-25 to 60°C
Derating		-
Mechanical characteristics	X67AI1223	X67AI1233
Dimensions		
Width		53 mm
Height		85 mm
Depth		42 mm

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Based on the current measured value.

³⁾ Based on the entire measurement range.

X67AI1323, X67AI1333



Short description	X67AI1323	X67AI1333
I/O module	4 analog inputs 0 to 20 mA or 4 to 20 mA	
General information	X67AI1323	X67AI1333
Connection type	M12, B-keyed	
Inputs	4x M12, A-keyed	
I/O supply	M8, 4-pin	
Power consumption		
Internal I/O	3 W	
X2X Link supply	0.75 W	
Certification		
CE	Yes	
cULus	Yes	
ATEX Zone 2 ¹⁾	Yes	
KC	Yes	
GOST-R	Yes	
Analog inputs	X67AI1323	X67AI1333
Input	0 to 20 mA or 4 to 20 mA	
Input type	Differential input	
Digital converter resolution	12-bit	16-bit
Conversion time	400 µs for all inputs	
Output format	INT	
Load	<300 Ω	
Input protection	Protection against wiring with supply voltage	
Max. error at 25°C		
Gain	0.1% ²⁾	-
Offset	0.05% ³⁾	-
Gain		
0 to 20 mA	-	0.13% ²⁾
4 to 20 mA	-	0.14% ²⁾
Offset		
0 to 20 mA	-	0.04% ³⁾
4 to 20 mA	-	0.11% ³⁾
Environmental conditions	X67AI1323	X67AI1333
Temperature		
Operation	-25 to 60°C	
Derating	-	
Mechanical characteristics	X67AI1323	X67AI1333
Dimensions		
Width	53 mm	
Height	85 mm	
Depth	42 mm	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Based on the current measured value.

³⁾ Based on the entire measurement range.

X67AI2744



Short description

I/O module	2 inputs for full-bridge strain gauges
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General information

Connection type	
X2X Link	M12, B-keyed
Inputs	4x M12, A-keyed
I/O supply	M8, 4-pin
Power consumption	
Bus	0.75 W
Internal I/O	1.6 W
Certification	
CE	Yes
cULus	Yes
KC	Yes
GOST-R	Yes

Full-bridge strain gauge

Strain gauge factor	2 to 256 mV/V, configurable using software
Input type	Differential, used to evaluate a full-bridge strain gauge
Digital converter resolution	24-bit
Conversion time	Depends on the configured data output rate
Data output rate	2.5 to 7,500 samples per second, configurable using software
Input filter	
Cutoff frequency	5 kHz
Order	3
Slope	60 dB
ADC filter characteristics	Sigma-delta
Operating range / Measurement sensor	85 to 5,000 Ω
Input protection	RC protection
Strain gauge supply	
Voltage	5.5 VDC / max. 65 mA
Connection	4-wire connections
Short circuit protection, overload protection	Yes

Operating conditions

Mounting orientation	
Horizontal	Yes
Vertical	Yes

Environmental conditions

Temperature	
Operation	-25 to 60°C
Derating	-

Mechanical characteristics

Dimensions	
Width	53 mm
Height	85 mm
Depth	42 mm

X67AI4850



Short description

I/O module	4 inputs for potentiometer displacement gauge
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General information

Connection type	
X2X Link	M12, B-keyed
Inputs	4x M12, A-keyed
I/O supply	M8, 4-pin

Power consumption	
Bus	0.75 W
Internal I/O	2 W

Certification	
CE	Yes
cULus	Yes
KC	Yes
GOST-R	Yes

Potentiometer supply

Short circuit protection	Yes
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Potentiometer, displacement gauge

Input type	Single ended input in the range from 0 to U_{pot}
Digital converter resolution	14-bit
Measurement sensor	0.5 to 10 k Ω , potentiometer
Conversion time	<200 μ s for all channels
Output format	INT (16-bit 2s complement)
Short circuit protection U_{pot}	Yes

Operating conditions

Mounting orientation	
Horizontal	Yes
Vertical	Yes

Environmental conditions

Temperature	
Operation	-25 to 60°C
Derating	-

Mechanical characteristics

Dimensions	
Width	53 mm
Height	85 mm
Depth	42 mm

Analog outputs

X67AO1223, X67AO1323



Short description	X67AO1223	X67AO1323
I/O module	4 analog outputs ± 10 V	4 analog outputs, 0 to 20 mA
General information	X67AO1223	X67AO1323
Connection type		M12, B-keyed
X2X Link		
Outputs		4x M12, A-keyed
I/O supply		M8, 4-pin
Power consumption		
Internal I/O	4 W	4.5 W
X2X Link supply		0.75 W
Certification		
CE		Yes
cULus		Yes
ATEX Zone 2 ¹⁾		Yes
KC		Yes
GOST-R		Yes
Analog outputs	X67AO1223	X67AO1323
Output	± 10 V	0 to 20 mA
Digital converter resolution		12-bit
Conversion time		400 μ s for all outputs
Settling time for output changes over entire range		Approx. 1 ms
Power on/off behavior		Internal enable relay for booting and errors
Output protection		Protection against wiring with supply voltage, short circuit protection
Max. error at 25°C and 10 k Ω load		
Gain	0.15% ²⁾	-
Offset	0.05% ³⁾	-
Max. error at 25°C and 50 Ω load		
Gain	-	0.2% ²⁾
Offset	-	0.05% ³⁾
Environmental conditions	X67AO1223	X67AO1323
Temperature		
Operation		-25 to 60°C
Derating		-
Mechanical characteristics	X67AO1223	X67AO1323
Dimensions		
Width		53 mm
Height		85 mm
Depth		42 mm

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Based on the current output value.

³⁾ Based on the entire output range.

Analog inputs and outputs

X67AM1223, X67AM1323



Short description	X67AM1223	X67AM1323
I/O module	2 analog inputs, 2 analog outputs, each ± 10 V	2 analog inputs, 2 analog outputs, each 0 to 20 mA
General information	X67AM1223	X67AM1323
Connection type		M12, B-keyed
X2X Link		4x M12, A-keyed
Inputs/Outputs		M8, 4-pin
I/O supply		
Power consumption		
Internal I/O		3 W
X2X Link supply		0.75 W
Certification		
CE		Yes
cULus		Yes
ATEX Zone 2 ¹⁾		Yes
KC		Yes
GOST-R		Yes
Analog inputs	X67AM1223	X67AM1323
Input	± 10 V	0 to 20 mA
Input type		Differential input
Digital converter resolution		12-bit
Conversion time		400 μ s for both inputs
Output format		INT
Input impedance in signal range	20 M Ω	-
Load	-	<300 Ω
Input protection		Protection against wiring with supply voltage
Max. error at 25°C		
Gain		0.1% ²⁾
Offset		0.05% ³⁾
Analog outputs	X67AM1223	X67AM1323
Output	± 10 V	0 to 20 mA
Digital converter resolution		12-bit
Conversion time		400 μ s for both outputs
Settling time for output changes over entire range		Approx. 1 ms
Power on/off behavior		Internal enable relay for booting and errors
Output protection		Protection against wiring with supply voltage, short circuit protection
Max. error at 25°C and 10 k Ω load		
Gain	0.15% ⁴⁾	-
Offset	0.05% ⁵⁾	-
Max. error at 25°C and 50 Ω load		
Gain	-	0.2% ⁴⁾
Offset	-	0.05% ⁵⁾

Analog inputs and outputs

X67AM1223, X67AM1323

Environmental conditions	X67AM1223	X67AM1323
Temperature		
Operation		-25 to 60°C
Derating		-
Mechanical characteristics	X67AM1223	X67AM1323
Dimensions		
Width		53 mm
Height		85 mm
Depth		42 mm

- ¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions
- ²⁾ Based on the current measured value.
- ³⁾ Based on the entire measurement range.
- ⁴⁾ Based on the current output value.
- ⁵⁾ Based on the entire output range.

Temperature measurement

X67AT1311, X67AT1322, X67AT1402



Short description	X67AT1311	X67AT1322	X67AT1402
I/O module	4 inputs for PT100 or resistance measurement	4 inputs for KTY10-6, KTY84-130, PT100 or PT1000 resistance temperature measurement	4 inputs for thermocouple sensors
General information	X67AT1311	X67AT1322	X67AT1402
Connection type		M12, B-keyed	
X2X Link			
Inputs		4x M12, A-keyed	
I/O supply		M8, 4-pin	
Power consumption			
Internal I/O	1.5 W	1.5 W	2.6 W
X2X Link supply		0.75 W	
Certification			
CE		Yes	
cULus		Yes	
ATEX Zone 2 ¹⁾	-	Yes	Yes
KC	-	Yes	Yes
GOST-R		Yes	
Thermocouple temperature inputs	X67AT1311	X67AT1322	X67AT1402
Input	-	-	Thermocouple
Digital converter resolution	-	-	16-bit
Filter time	-	-	Configurable between 2 and 20 ms
Output format	-	-	INT
Measurement range			
Sensor temperature			
FeCuNi: Type J	-	-	-210 to 1200°C
NiCrNi: Type K	-	-	-270 to 1372°C
PtRhPt: Type S	-	-	-50 to 1768°C
Terminal temperature	-	-	-25 to 85°C
Raw value	-	-	±65.534 mV
Terminal temperature compensation	-	-	Using an X67AC9A02 thermocouple connector (accessory) ²⁾
Conversion time	-	-	62 ms per channel with 50 Hz filter + 62 ms per cycle for terminal temperature measurement with 50 Hz filter
Temperature inputs resistance measurement	X67AT1311	X67AT1322	X67AT1402
Input	Resistance measurement with constant current supply for 2- or 4-wire connections	Resistance measurement with constant current supply for 2- or 4-wire connections	-
Digital converter resolution	16-bit	16-bit	-
Filter time	Configurable between 2 and 20 ms	Configurable between 2 and 20 ms	-
Conversion time	75 ms per channel with 50 Hz filter	-	-
Conversion time			
Same sensor types	-	75 ms per channel with 50 Hz filter	-
When switching sensor type	-	195 ms per channel with 50 Hz filter	-
Output format	INT or UINT for resistance measurement	INT or UINT for resistance measurement	-

Temperature measurement

X67AT1311, X67AT1322, X67AT1402

Sensor			
Sensor type	-	Configurable per channel	-
KTY10-6	-	-50 to 145°C	-
KTY84-130	-	-40 to 300°C	-
PT100	-	-200 to 850°C	-
PT1000	-	-200 to 850°C	-
PT100 temperature measurement range	Configurable per channel	-	-
PT100 temperature measurement range			
Resolution 0.01 K	-200 to 270°C	-	-
Resolution 0.02 K	-200 to 645°C	-	-
Resolution 0.04 K	-200 to 850°C	-	-
Resistance measurement range	Configurable per channel	0.1 to 4500 Ω / 0.05 to 2250 Ω	-
Resistance measurement range			
Resolution 0.01 Ω	0.010 to 420 Ω	-	-
Resolution 0.005 Ω	0.005 to 210 Ω	-	-
Max. error at 25°C			
Gain	0.008% ³⁾	0.01% ³⁾	-
Offset	0.012% ⁴⁾	0.015% ⁴⁾	-
Environmental conditions	X67AT1311	X67AT1322	X67AT1402
Temperature			
Operation		-25 to 60°C	
Mechanical characteristics	X67AT1311	X67AT1322	X67AT1402
Dimensions			
Width		53 mm	
Height		85 mm	
Depth		42 mm	

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ At least one terminal temperature sensor is required to determine the temperature measured at the J, K and S thermocouple sensors.

³⁾ Based on the current resistance value.

⁴⁾ Based on the entire resistance measurement range.

X67MM2436



Short description

I/O module	2-channel PWM output (H bridge) 2x 3 inputs for ABR incremental encoder
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General information

Sensor supply	Max. 0.02 A per group
Connection type	
X2X Link	M12, B-keyed
Inputs/Outputs	4x M12, A-keyed
I/O supply	M8, 4-pin
Power consumption	
Internal I/O	1 W
X2X Link supply	0.75 W
Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	In preparation
KC	Yes
GOST-R	Yes

Digital inputs

Quantity	6
Nominal voltage	24 VDC
Input filter	
Hardware	<5 µs
Software	-
Input circuit	Sink
Additional functions	2x ABR incremental encoder (+24 VDC), 2x AB incremental encoder, 2x event counter, 2x period duration measurement/gate measurement,

ABR incremental encoder

Quantity	2
Encoder inputs	24 VDC, asymmetrical
Counter size	16-bit
Input frequency	Max. 50 kHz
Evaluation	4x
Encoder supply	Module-internal, max. 20 mA per encoder

PWM output

Quantity	2
Type	H bridge
Nominal voltage	24 to 38.5 VDC ±25%
PWM frequency	15 Hz to 50 kHz
Output current	
Nominal current	3 A
Max. current / output	5 A for 2 s (after a recovery time of at least 10 s at maximal 3 A)
Max. current / module	8 A

Environmental conditions

Temperature	
Operation	0 to 55°C
Derating	-

Mechanical characteristics

Dimensions	
Width	53 mm
Height	85 mm
Depth	42 mm

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Motor controllers

X67SM2436, X67SM4320



Short description	X67SM2436	X67SM4320
I/O module	2 full bridges for controlling stepper motors	4 full bridges for controlling stepper motors
General information	X67SM2436	X67SM4320
Connection type		M12, B-keyed
X2X Link		
Inputs/Outputs	4x M12, A-keyed	-
Outputs	-	4x M12, A-keyed
I/O supply		M8, 4-pin
Power consumption		
Internal I/O	-	2 W
X2X Link supply		0.75 W
Internal I/O		
At 24 VDC	Max. 1.7 W	-
At 48 VDC	Max. 2 W	-
Certification		
CE		Yes
cULus		Yes
ATEX Zone 2 ¹⁾	-	In preparation
KC		Yes
GOST-R		Yes
Motor bridge - Power unit	X67SM2436	X67SM4320
Quantity	2	4
Type	2-phase bipolar stepper motor (full bridge)	2-phase bipolar stepper motor
Nominal voltage	24 to 38.5 VDC ±25%	24 VDC ±25%
Nominal current	3 A	1 A
Max. current / motor	5 A for 2 s (after a recovery time of at least 10 s at maximal 3 A)	1.5 A for 2 s (after a recovery time of at least 10 s at maximal 1 A)
Max. current / module	8 A	6 A
Controller frequency		38.5 kHz
DC bus capacitance	200 µF	440 µF
Step resolution		256 microsteps per full step
Digital inputs	X67SM2436	X67SM4320
Quantity	6	-
Nominal voltage	24 VDC	-
Input filter		
Hardware	<5 µs	-
Software		-
Input circuit	Sink	-
Additional functions	2x ABR incremental encoder	-
ABR incremental encoder	X67SM2436	X67SM4320
Quantity	2	-
Encoder inputs	24 V, asymmetrical	-
Counter size	16-bit	-
Input frequency	Max. 50 kHz	-
Evaluation	4x	-
Encoder supply	Module-internal, max. 20 mA per encoder	-

X67SM2436, X67SM4320

Environmental conditions	X67SM2436	X67SM4320
Temperature		
Operation		0 to 50°C
Derating		-
Mechanical characteristics	X67SM2436	X67SM4320
Dimensions		
Width		53 mm
Height		85 mm
Depth		42 mm

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Additional functions

X67UM1352



Short description

I/O module 4 digital inputs, 2 digital outputs, 1 input for full-bridge strain gauge

General information

Connection type	
X2X Link	M12, B-keyed
Inputs/Outputs	4x M12, A-keyed
I/O supply	M8, 4-pin
Power consumption	
Internal I/O	1 W
X2X Link supply	0.75 W
Certification	
CE	Yes
cULus	Yes
KC	Yes

Full-bridge strain gauge

Strain gauge factor	± 15.625 to ± 125 mV/V, configurable using software
Input type	Differential, used to evaluate a full-bridge strain gauge
Digital converter resolution	24-bit
Conversion time	Depends on the configured data output rate
Data output rate	10 to 3,750 samples per second, configurable using software
Input filter	
Cutoff frequency	50 kHz
Order	1
Slope	20 dB
Operating range / Measurement sensor	75 to 5,000 Ω
Input protection	RC protection
Input current	450 nA
Gain	1 to 8, configurable using software
Strain gauge supply	
Voltage	4.5 VDC / max. 60 mA
Connection	4-wire connections
Short circuit protection, overload protection	Yes

Digital inputs

Quantity	4
Nominal voltage	24 VDC
Input filter	
Hardware	<1 ms
Software	-
Input circuit	Sink
Sensor supply	0.5 A summation current

X67UM1352

Digital outputs

Quantity	2
Nominal voltage	24 VDC
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply
Actuator supply	External
Nominal output current	
Output 1	0.5 A
Output 2	1 A
Max. frequency	
Output 1	100 Hz
Output 2	1 kHz

Environmental conditions

Temperature	
Operation	-25 to 60°C

Mechanical characteristics

Dimensions	
Width	53 mm
Height	85 mm
Depth	42 mm

Additional functions

X67DS438A



Short description

I/O module	IO-Link master with 4 IO-Link interfaces
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General information

Diagnostics	
I/Q status	Yes, using software
Connection type	
X2X Link	M12, B-keyed
Inputs	M12, A-keyed
I/O supply	M8, 4-pin
Cable specification	
Cable type	4-pin sensor cable, unshielded
Cable length	Max. 20 m
Line capacitance	Max. 3 nF
Loop resistance	Max. 6 Ω
Power consumption	
Internal I/O	0.5 W
X2X Link supply	0.75 W
Additional power dissipation caused by the actuators (resistive) [W]	-
Electrical isolation	
Bus - IO-Link	Yes
IO-Link - IO-Link	No
Certification	
CE	Yes
GOST-R	Yes

IO-Link in master mode

Transfer rates	
COM1	4.8 kbaud
COM2	38.4 kbaud
COM3	230.4 kbaud
Limits for COM3	
Max. connection capacitance	22 nF (cable + IO-Link device)
Max. load	96 Ω / 250 mA
Data format	1 start bit, 8 data bits, 1 parity bit (even), 1 stop bit
Bus level	24 VDC (active), 0 VDC (resting voltage)

IO-Link in SIO mode "digital output"

Nominal voltage	24 VDC
Nominal output current	0.25 A
Total nominal current	Max. 1 A
Output circuit	Sink or source
Output protection	Thermal cutoff if overcurrent or short circuit occurs, integrated protection for switching inductances

IO-Link in SIO mode "digital input"

Nominal voltage	24 VDC
Input filter	
Hardware	300 ns
Input circuit	Sink

IO-Link I/Q interface (digital input)

Nominal voltage	24 VDC
Input filter	
Hardware	$\leq 60 \mu\text{s}$
Software	Default 1 ms, configurable between 0 and 25.5 ms
Input circuit	Sink

X67DS438A

Environmental conditions

Temperature

Operation	-25 to 60°C
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Mechanical characteristics

Dimensions

Width	53 mm
Height	85 mm
Depth	42 mm

Counter functions

X67DC1198



Short description

I/O module	2 SSI absolute encoders 5 V or 2 ABR incremental encoders 5 V, 4 AB counters or 4 up/down counters 24 V, 2x pulse width modulation, time measurement, relative timestamp
------------	--

General information

Sensor/Actuator supply	0.5 A summation current
Connection type	
X2X Link	M12, B-keyed
Inputs/Outputs	2x M12, 5-pin, A-keyed
SSI/ABR encoder	2x M12, 12-pin, A-keyed
I/O supply	M8, 4-pin
Power consumption	
Internal I/O	2.8 W
X2X Link supply	0.75 W

Certification

CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GOST-R	Yes

SSI absolute encoder

Quantity	2
Encoder inputs	5 V, symmetrical
Counter size	32-bit
Max. transfer rate	1 Mbit/s
Encoder supply	
5 VDC	Module-internal, max. 0.3 A total current
24 VDC	Module-internal, max. 0.5 A total current

ABR incremental encoder

Quantity	2
Encoder inputs	5 V, symmetrical
Counter size	16/32-bit
Input frequency	Max. 250 kHz
Evaluation	4x
Encoder supply	
5 VDC	Module-internal, max. 0.3 A total current
24 VDC	Module-internal, max. 0.5 A total current

AB counter

Quantity	4
Evaluation	4x
Input frequency	Max. 100 kHz
Encoder inputs	24 V, asymmetrical
Encoder supply 24 VDC	Module-internal, max. 0.5 A total current
Counter size	16/32-bit

Digital inputs 5 VDC

Quantity	Up to 6, configurable as inputs or outputs using software
Nominal voltage	5 VDC differential signal, EIA RS485 standard
Input filter	
Hardware	200 ns
Software	-

Additional functions	ABR incremental encoder, SSI absolute encoder, event counting, time measurement, relative timestamp
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X67DC1198

Digital inputs 24 VDC

Quantity	Up to 8, configurable as inputs or outputs using software
Nominal voltage	24 VDC
Input circuit	Sink
Input filter	
Hardware	≤2 μs
Software	-
Additional functions	Reference enable inputs for ABR, event counting, latch function, time measurement, relative timestamp

Event counter

Quantity	8
Evaluation	2x
Input frequency	Max. 100 kHz
Encoder inputs	24 V, asymmetrical
Encoder supply 24 VDC	Module-internal, max. 0.5 A total current
Counter size	16/32-bit

Up/Down counters

Quantity	4
Evaluation	2x
Input frequency	Max. 100 kHz
Encoder inputs	24 V, asymmetrical
Encoder supply 24 VDC	Module-internal, max. 0.5 A total current
Counter size	16/32-bit

Time measurement

Possible measurements	Gate time, period duration, edge offset for various channels
Measurements per module	Up to 9
Measurements per channel	Up to 2
Counter size	16-bit
Counter frequency	
Internal	8 MHz, 4 MHz, 2 MHz, 1 MHz, 500 kHz, 250 kHz, 125 kHz, 62.5 kHz
Signal form	Square wave pulse
Measurement type	Continuous or triggered

Digital outputs 5 VDC

Quantity	Up to 6, configurable as inputs or outputs using software
Type	5 VDC differential signal, EIA RS485 standard
Output circuit	Sink or source
Output protection	Short circuit protection

Digital outputs 24 VDC

Quantity	Up to 8, configurable as inputs or outputs using software
Nominal voltage	24 VDC
Nominal output current	0.1 A
Total nominal current	0.8 A
Output circuit	Sink or source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply
Pulse width modulation ²⁾	
Period duration	41.6 μs to 500 ms
Pulse duration	0 to 100%
Resolution	0.1%
Additional functions	Pulse width modulation, comparator function

Counter functions

X67DC1198

Environmental conditions

Temperature	
Operation	-25 to 60°C
Derating	-

Mechanical characteristics

Dimensions	
Width	53 mm
Height	85 mm
Depth	42 mm

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Dead time when switching between push and pull: max. 1.5 µs.

X67DC2322



Short description

I/O module	2 resolver inputs, 2 digital inputs, 2 digital outputs
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General information

Power consumption	
Bus	0.75 W
Internal I/O	2 W
Certification	
CE	Yes
cULus	Yes
KC	Yes
GOST-R	Yes

Resolver inputs

Quantity	2
Reference output	
Frequency	10 kHz
Type	Differential
Angular position resolution	14-bit
Short circuit protection (reference output)	Yes
Resolver transformation ratio	
BRX	0.5 (±10%)
BRT	1.0 (±10%)

Digital inputs

Quantity	2
Nominal voltage	24 VDC
Input filter	
Hardware	≤20 µs
Software	-
Input circuit	Sink
Sensor supply	0.5 A summation current

Digital outputs

Quantity	2
Nominal voltage	24 VDC
Nominal output current	0.5 A
Total nominal current	1 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply

Environmental conditions

Temperature	
Operation	-25 to 60°C

Mechanical characteristics

Dimensions	
Width	53 mm
Height	85 mm
Depth	42 mm

X67IF1121-1



Short description

Communication module	1x RS232 or 1x RS485/RS422, 2 digital inputs, 2 digital channels configurable as inputs or outputs using software
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General information

Sensor/Actuator supply	0.5 A summation current
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Connection type

X2X Link	M12, B-keyed
Interfaces and inputs/outputs	4x M12, A-keyed
I/O supply	M8, 4-pin

Power consumption

Internal I/O	2.4 W
X2X Link supply	0.75 W

Certification

CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GOST-R	Yes

Interfaces

IF1 interface

Signal	RS232
Max. distance	900 m
Transfer rate	Max. 115.2 kbit/s

IF2 interface

Signal	RS485/RS422
Max. distance	1200 m
Transfer rate	Max. 115.2 kbit/s

Digital inputs

Quantity	Up to 4 if the 2 digital channels are used as digital inputs
Nominal voltage	24 VDC
Input filter	
Hardware	≤100 μs
Software	Default 0 ms, configurable between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink

Digital outputs

Quantity	Up to 2 if the 2 digital channels are used as digital outputs
Nominal voltage	24 VDC
Nominal output current	0.5 A
Total nominal current	1 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output power supply

Environmental conditions

Temperature	
Operation	-25 to 60°C
Derating	-

Mechanical characteristics

Dimensions	
Width	53 mm
Height	85 mm
Depth	42 mm

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X67BC81RT.L12



Short description

Bus controller POWERLINK (V1/V2) controlled node

General information

Inputs/Outputs 4 digital inputs,
5 digital channels, configurable as inputs or outputs using software,
2 analog inputs,
1 analog output,
1 ABR input, also usable as 5 V differential inputs/outputs,
Inputs with special functions

Nominal voltage 24 VDC

reACTION-capable I/O channels Yes

Connection type

Fieldbus M12, D-keyed
X2X Link M12, B-keyed
Inputs/Outputs M12, 5-pin, A-keyed
Encoder M12, 12-pin, A-keyed
I/O supply M8, 4-pin

Power output 15 W X2X Link power supply for I/O modules

Power consumption

Fieldbus 4.6 W
Internal I/O 6 W
X2X Link supply 19.6 W at maximum power output for connected I/O modules

Certification

CE Yes
GOST-R Yes

Interfaces

Fieldbus POWERLINK (V1/V2) controlled node

Design 2x M12 circular connector (hub), 2x female connector on the module

Cable length Max. 100 m between two stations (segment length)

Transfer rate 100 Mbit/s

Transmission

Physical layer 100BASE-TX
Half-duplex Yes
Full-duplex No
Autonegotiation Yes
Auto-MDI / MDIX Yes

Hub runtime 0.96 to 1 μ s

Min. cycle time ¹⁾

Fieldbus 200 μ s
X2X Link 200 μ s

Synchronization between bus systems possible Yes

Encoder supply connector 8

5 VDC Module-internal, max. 0.3 A total current

24 VDC Module-internal, max. 0.5 A total current

Digital inputs 5 VDC

Nominal voltage 5 VDC

Input filter

Hardware No input filter
Software Default 200 ms, configurable between 200 ns and 5 ms in 20 ns intervals

Digital inputs 24 VDC

Nominal voltage 24 VDC

Input circuit Sink

Input filter

Hardware ≤ 50 ns
Software Default 200 ms, configurable between 200 ns and 5 ms in 20 ns intervals

X67BC81RT.L12

Analog inputs

Input	±10 V
Input type	Single-ended
Digital converter resolution	12-bit
Conversion time	5 µs for both inputs
Output format	INT
Input protection	Protection against wiring with supply voltage
Open line detection	Yes, using software
Reverse polarity protection	Yes
Max. error at 25°C	
Gain	0.1% ²⁾
Offset	0.05% ³⁾
Max. drift at 25°C	
Gain	0.01% / °C ²⁾
Offset	0.0075% / °C ³⁾

Digital outputs 5 VDC

Output protection	Short circuit protection
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Digital outputs 24 VDC

Nominal voltage	24 VDC
Nominal output current	0.4 A
Output protection	Thermal cutoff for overcurrent and short circuit

Analog outputs

Output	±10 V
Digital converter resolution	12-bit
Conversion time	2 µs
Settling time for output changes over entire range	2.5 µs
Power on/off behavior	Internal enable relay for booting
Max. error at 25°C	
Gain	0.15% ²⁾
Offset	0.05% ³⁾
Output protection	Short circuit protection
Max. error at 25°C and 10 kΩ load	
Gain	0.15%
Offset	0.05%

Environmental conditions

Temperature	
Operation	-25 to 60°C

Mechanical characteristics

Dimensions	
Width	53 mm
Height	155 mm
Depth	42 mm

¹⁾ The minimum cycle time defines how far the bus cycle can be reduced without communication errors occurring.

²⁾ Based on the current output value.

³⁾ Based on the total output value.



Pre-assembled cables

POWERLINK cable, RJ45 to RJ45



Connection cables

Length	Model number	Short description
0.2 m	X20CA0E61.00020	POWERLINK connection cable, RJ45 to RJ45, 0.2 m
0.25 m	X20CA0E61.00025	POWERLINK connection cable, RJ45 to RJ45, 0.25 m
0.3 m	X20CA0E61.00030	POWERLINK connection cable, RJ45 to RJ45, 0.3 m
0.35 m	X20CA0E61.00035	POWERLINK connection cable, RJ45 to RJ45, 0.35 m
0.4 m	X20CA0E61.00040	POWERLINK connection cable, RJ45 to RJ45, 0.4 m
0.5 m	X20CA0E61.00050	POWERLINK connection cable, RJ45 to RJ45, 0.5 m
1 m	X20CA0E61.00100	POWERLINK connection cable, RJ45 to RJ45, 1 m
1.5 m	X20CA0E61.00150	POWERLINK connection cable, RJ45 to RJ45, 1.5 m
2 m	X20CA0E61.00200	POWERLINK connection cable, RJ45 to RJ45, 2 m
5 m	X20CA0E61.00500	POWERLINK connection cable, RJ45 to RJ45, 5 m
10 m	X20CA0E61.01000	POWERLINK connection cable, RJ45 to RJ45, 10 m
15 m	X20CA0E61.01500	POWERLINK connection cable, RJ45 to RJ45, 15 m
20 m	X20CA0E61.02000	POWERLINK connection cable, RJ45 to RJ45, 20 m

POWERLINK cable, RJ45 to RJ45



Connection cables

Length	Model number	Short description
50 m	X20CA0E61.0500	POWERLINK connection cable, RJ45 to RJ45, 50 m

POWERLINK cables, RJ45 to RJ45, can be used in cable drag chains

Connection cables

Length	Model number	Short description
10 m	X20CA3E61.0100	POWERLINK connection cable, RJ45 to RJ45, can be used in drag chains, 10 m
15 m	X20CA3E61.0150	POWERLINK connection cable, RJ45 to RJ45, can be used in drag chains, 15 m
35 m	X20CA3E61.0350	POWERLINK connection cable, RJ45 to RJ45, can be used in drag chains, 35 m

For detailed information and support: www.br-automation.com

POWERLINK cables, RJ45 to M12



Attachment cables

Length	Model number	Short description
1 m	X67CA0E41.0010	POWERLINK attachment cable, RJ45 to M12, 1 m
5 m	X67CA0E41.0050	POWERLINK attachment cable, RJ45 to M12, 5 m
15 m	X67CA0E41.0150	POWERLINK attachment cable, RJ45 to M12, 15 m
50 m	X67CA0E41.0500	POWERLINK attachment cable, RJ45 to M12, 50 m

POWERLINK cable, RJ45 to M12, can be used in cable drag chains



Attachment cables

Length	Model number	Short description
15 m	X67CA3E41.0150	POWERLINK attachment cable, RJ45 to M12, can be used in cable drag chains, 15 m

POWERLINK cables, M12 to M12



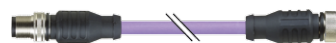
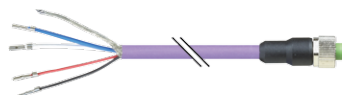
Connection cables

Length	Model number	Short description
2 m	X67CA0E61.0020	POWERLINK connection cable, M12 to M12, 2 m
5 m	X67CA0E61.0050	POWERLINK connection cable, M12 to M12, 5 m
10 m	X67CA0E61.0100	POWERLINK connection cable, M12 to M12, 10 m
15 m	X67CA0E61.0150	POWERLINK connection cable, M12 to M12, 15 m

For detailed information and support: www.br-automation.com

Pre-assembled cables

X2X Link cables, straight



Attachment cables

Length	Model number	Short description
0.25 m	-	-
0.4 m	-	-
0.5 m	X67CA0X21.0005	X2X Link attachment cable, 0.5 m
1 m	X67CA0X21.0010	X2X Link attachment cable, 1 m
1.5 m	-	-
2 m	X67CA0X21.0020	X2X Link attachment cable, 2 m
5 m	X67CA0X21.0050	X2X Link attachment cable, 5 m
10 m	X67CA0X21.0100	X2X Link attachment cable, 10 m
15 m	X67CA0X21.0150	X2X Link attachment cable, 15 m
25 m	-	-

Connection cables

Model number	Short description
X67CA0X01.0002	X2X Link connection cable, 0.25 m
X67CA0X01.0004	X2X Link connection cable, 0.4 m
X67CA0X01.0005	X2X Link connection cable, 0.5 m
X67CA0X01.0010	X2X Link connection cable, 1 m
X67CA0X01.0015	X2X Link connection cable, 1.5 m
X67CA0X01.0020	X2X Link connection cable, 2 m
X67CA0X01.0050	X2X Link connection cable, 5 m
X67CA0X01.0100	X2X Link connection cable, 10 m
X67CA0X01.0150	X2X Link connection cable, 15 m
X67CA0X01.0250	X2X Link connection cable, 25 m

X2X Link cables, angled



Attachment cables

Length	Model number	Short description
0.25 m	-	-
0.5 m	-	-
1 m	-	-
2 m	X67CA0X31.0020	X2X Link attachment cable, angled, 2 m
5 m	X67CA0X31.0050	X2X Link attachment cable, angled, 5 m
10 m	X67CA0X31.0100	X2X Link attachment cable, angled, 10 m
15 m	X67CA0X31.0150	X2X Link attachment cable, angled, 15 m

Connection cables

Model number	Short description
X67CA0X11.0002	X2X Link connection cable, angled, 0.25 m
X67CA0X11.0005	X2X Link connection cable, angled, 0.5 m
X67CA0X11.0010	X2X Link connection cable, angled, 1 m
X67CA0X11.0020	X2X Link connection cable, angled, 2 m
X67CA0X11.0050	X2X Link connection cable, angled, 5 m
X67CA0X11.0100	X2X Link connection cable, angled, 10 m
X67CA0X11.0150	X2X Link connection cable, angled, 15 m

X2X Link cables, straight (continued)



Open-ended cables

Length	Model number	Short description
0.25 m	-	-
0.4 m	-	-
0.5 m	-	-
1 m	-	-
1.5 m	-	-
2 m	X67CA0X41.0020	X2X Link open-ended cable, 2 m
5 m	X67CA0X41.0050	X2X Link open-ended cable, 5 m
10 m	-	-
15 m	-	-
25 m	-	-

Pre-assembled cables

I/O supply cables, straight



Attachment cables			Connection cables	
Length	Model number	Short description	Model number	Short description
0.25 m	X67CA0P20.0002	Power attachment cable, 0.25 m	X67CA0P00.0002	Power connection cable, 0.25 m
0.4 m	-	-	X67CA0P00.0004	Power connection cable, 0.4 m
0.5 m	-	-	X67CA0P00.0005	Power connection cable, 0.5 m
1 m	X67CA0P20.0010	Power attachment cable, 1 m	X67CA0P00.0010	Power connection cable, 1 m
1.5 m	-	-	X67CA0P00.0015	Power connection cable, 1.5 m
2 m	X67CA0P20.0020	Power attachment cable, 2 m	X67CA0P00.0020	Power connection cable, 2 m
5 m	X67CA0P20.0050	Power attachment cable, 5 m	X67CA0P00.0050	Power connection cable, 5 m
10 m	X67CA0P20.0100	Power attachment cable, 10 m	-	-
15 m	X67CA0P20.0150	Power attachment cable, 15 m	X67CA0P00.0150	Power connection cable, 15 m
20 m	X67CA0P20.0200	Power attachment cable, 20 m	-	-

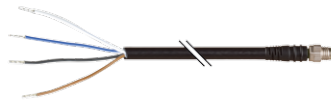
I/O supply cables, angled



Attachment cables			Connection cables	
Length	Model number	Short description	Model number	Short description
0.25 m	-	-	X67CA0P10.0002	Power connection cable, angled, 0.25 m
1 m	-	-	X67CA0P10.0010	Power connection cable, angled, 1 m
2 m	X67CA0P30.0020	Power attachment cable, angled, 2 m	X67CA0P10.0020	Power connection cable, angled, 2 m
5 m	X67CA0P30.0050	Power attachment cable, angled, 5 m	X67CA0P10.0050	Power connection cable, angled, 5 m
10 m	-	-	X67CA0P10.0100	Power connection cable, angled, 10 m
15 m	X67CA0P30.0150	Power attachment cable, angled, 15 m	-	-

For detailed information and support: www.br-automation.com

I/O supply cables, straight (continued)



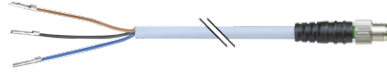
Open-ended cables

Length	Model number	Short description
0.25 m	-	-
0.4 m	-	-
0.5 m	-	-
1 m	-	-
1.5 m	-	-
2 m	X67CA0P40.0020	Power open-ended cable, 2m
5 m	X67CA0P40.0050	Power open-ended cable, 5m
10 m	-	-
15 m	-	-
20 m	-	-

For detailed information and support: www.br-automation.com

Pre-assembled cables

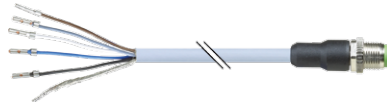
M8 sensor cables



M8 attachment cables, straight

Length	Model number	Short description
2 m	X67CA0D40.0020	M8 sensor cable, 2 m
5 m	X67CA0D40.0050	M8 sensor cable, 5 m

M12 sensor cables



M12 attachment cables, straight

Length	Model number	Short description
2 m	X67CA0A41.0020	M12 sensor cable, 2 m
5 m	X67CA0A41.0050	M12 sensor cable, 5 m

For detailed information and support: www.br-automation.com

Field wiring connectors

CAN bus / DeviceNet

X67AC0C01, X67AC2C01, X67AC0C21, X67AC2C21



General information	X67AC0C01	X67AC2C01	X67AC0C21	X67AC2C21
Connection	Male M12 connector	Male M12 connector	Female M12 connector	Female M12 connector
Keying			A-keyed	
Type of terminal clamp	Cage clamp terminal block	Screw clamp terminal block	Cage clamp terminal block	Screw clamp terminal block
Short description	X67 male M12 connector, 5-pin, A-keyed, shielded, cage clamp connection	X67 male M12 connector, 5-pin, A-keyed, shielded, screw clamp connection	X67 female M12 connector, 5-pin, A-keyed, shielded, cage clamp connection	X67 female M12 connector, 5-pin, A-keyed, shielded, screw clamp connection
Number of pins			5-pin	
Shielding			Yes	

PROFIBUS DP / X2X Link

X67AC0X01, X67AC2X01, X67AC0X21, X67AC2X21



General information	X67AC0X01	X67AC2X01	X67AC0X21	X67AC2X21
Connection	Male M12 connector	Male M12 connector	Female M12 connector	Female M12 connector
Keying			B-keyed	
Type of terminal clamp	Cage clamp terminal block	Screw clamp terminal block	Cage clamp terminal block	Screw clamp terminal block
Short description	X67 male M12 connector, 5-pin, B-keyed, shielded, cage clamp connection	X67 male M12 connector, 5-pin, B-keyed, shielded, screw clamp connection	X67 female M12 connector, 5-pin, B-keyed, shielded, cage clamp connection	X67 female M12 connector, 5-pin, B-keyed, shielded, screw clamp connection
Number of pins			5-pin	
Shielding			Yes	

Field wiring connectors

POWERLINK

X67AC2E01



General information

Connection	Male M12 connector
Keying	D-keyed
Type of terminal clamp	Insulation piercing connection
Short description	X67 male M12 connector, 4-pin, D-keyed, shielded, insulation piercing connection
Number of pins	4-pin
Shielding	Yes

I/O power supply

X67AC0P00, X67AC0P20



General information

	X67AC0P00	X67AC0P20
Connection	Male M8 connector	Female M8 connector
Keying		-
Type of terminal clamp		Piercing connection
Short description	X67 male M8 connector, 4-pin, piercing connection	X67 female M8 connector, 4-pin, piercing connection
Number of pins		4-pin
Shielding		-

Sensors/Actuators

X67AC0D00, X67AC0A00, X67AC2A00



General information	X67AC0D00	X67AC0A00	X67AC2A00
Connection	Male M8 connector	Male M12 connector	Male M12 connector
Keying	-	A-keyed	A-keyed
Type of terminal clamp	Piercing connection	Cage clamp terminal block	Screw clamp terminal block
Short description	X67 male M8 connector, 3-pin, piercing connection	X67 male M12 connector, 5-pin, A-keyed, cage clamp connection	X67 male M12 connector, 5-pin, A-keyed, screw clamp connection
Number of pins	3-pin	5-pin	5-pin
Shielding		-	

Special-purpose connectors

X67AC9A02



General information	
Note	Connector for an external thermocouple sensor PT1000 sensor for internal measurement point compensation integrated in the connector
Connection	Male M12 connector
Keying	A-keyed
Type of terminal clamp	Screw clamp terminal block
Short description	X67 male M12 thermocouple connector for compensation of measurement point temperature, screw clamp connection
Number of pins	5-pin
Shielding	-
Certification	
CE	Yes

Additional accessories

Terminating resistor

X67AC9C03, X67AC9B03



General information	X67AC9C03		X67AC9B03
Note	CAN bus		PROFIBUS DP
Connection		M12	
Keying		-	
Short description	X67 M12 CAN bus terminating resistor		X67 PROFIBUS DP M12 terminating resistor
Shielding		-	
Certification			
KC		Yes	

Connectors

X67AC8C00, X67AC8B00



General information	X67AC8C00		X67AC8B00
Note	CAN bus		PROFIBUS DP
Connection		M12	
Keying		Y-connector	
Short description	X67 CAN bus Y-connector		X67 PROFIBUS DP Y-connector
Shielding		-	
Certification			
KC		Yes	

Note: Product photos are not shown to scale.

Threaded caps

X67AC0M08, X67AC0M12



General information

	X67AC0M08	X67AC0M12
Note		Package of 50 pcs.
Connection	M8	M12
Short description	X67 M8 threaded caps, 50 pcs.	X67 M12 threaded caps, 50 pcs.

Plain text tags



Model number	Short description
X67AC0SH1	X67 plain text tag
X67AC0SH1.0100	X67 plain text tag, 100 pcs. per package
X67AC0LB2.0100	X67 slide-in labels for X67 slide-in label templates, paper, white, perforated, 80 labels on A4 sheets, 100 sheets per package

Additional accessories

Mounting plates for top-hat rails

X67ACTS35, X67ACTS35.0010



General information

	X67ACTS35	X67ACTS35.0010
Note	Including mounting screws, 1 pcs. per package	Including mounting screws, 10 pcs. per package
Short description	X67 top-hat rail installation plate	X67 top-hat rail installation plate, 10 pcs. per package
Installation		For TS 35 top-hat rails
Certification		
CE		Yes
KC		Yes

Installation tool

The connectors and couplings of pre-assembled X67 cables have an additional across flat on the knurled-head screw that can be used as an installation tool. Two torque wrenches (M8 and M12) are included as accessories to make installation easy. They enable an absolutely reliable connection to the X67 module.

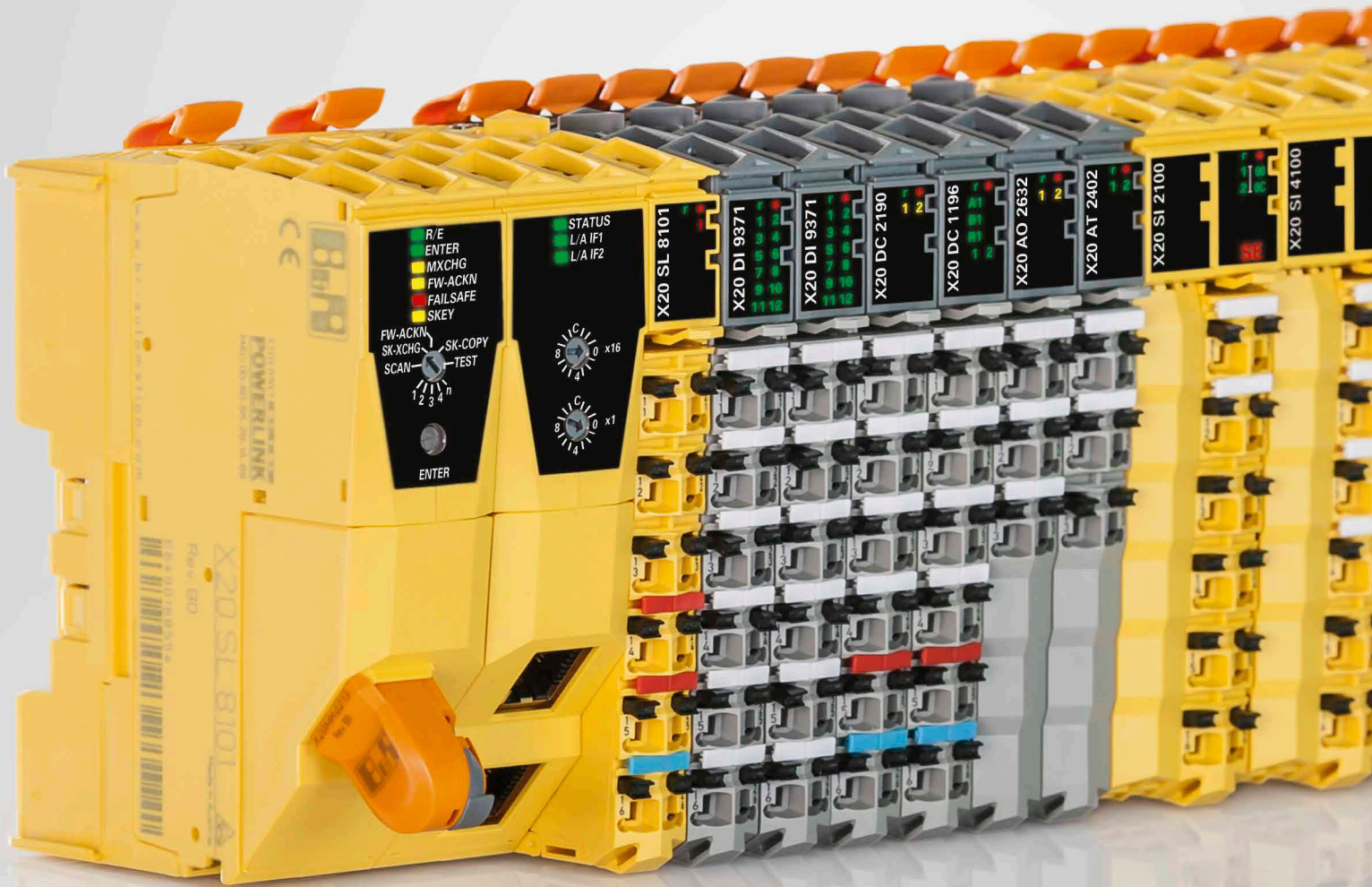
X67ACTQ08, X67ACTQ12



General information

	X67ACTQ08	X67ACTQ12
Short description	X67 torque wrench 0.4 Nm for X67 connectors, size M8, for hex-head connectors	X67 torque wrench 0.6 Nm for X67 connectors, size M12, for hex-head connectors







Integrated safety technology













Functional safety - Decentralized and intelligent

Safety shutdowns do not always have to involve a full machine stop. Smart, safe reactions to various situations provide safety without always having to interrupt the production process. Intelligent, decentralized and integrated safety technology that is simple to operate and that achieves extremely fast response times opens up entirely new approaches to implementing machine safety.

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Integrated safety technology - Accessories



Storage medium

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Integrated safety technology - X67 system



Digital input modules

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Digital mixed modules

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System features

Safe configurations - SafeOPTION

The series-produced machines offered by today's innovative manufacturers can be customized with a whole range of optional features – placing special demands on the safety technology involved. Traditional safety solutions can't manage this level of flexibility, resulting in potentially dangerous compromises. B&R's array of Smart Safe Reaction functions offer a custom-tailored solution.

Smart Safe Reaction – It doesn't have to mean downtime

Conventional safety technology generally means stopping the entire machine group when even the smallest disturbance occurs. B&R's Smart Safe Reaction uses a completely different approach. Flexible safety functions such as Safe Direction or Safely Limited Increment are integral parts of the drive system and allow service work to be performed during operation. This minimizes the time and effort required for service and installation work and also eliminates the motivation to tamper with the system.

Virtual wiring – Safety at the click of a mouse

In Automation Studio, safety shutdowns that used to be handled with hard wiring are now implemented using virtual wiring by positioning and connecting pre-certified blocks in a graphical editor. Even extremely complex relationships can be managed clearly and easily in this way. Unlike real wiring, an identical copy of the safety application is executed in the safety controller, which completely eliminates the possibility of wiring errors during series production and significantly reduces commissioning times. Put simply, the safe PLC provides options that were never possible with real wiring.

Safe wiring made easy

Intelligent tests carried out internally in the modules continuously check every single meter of cabling for quality issues, eliminating safety risks and making shielded cables and expensive protected lines obsolete along the way. Testing patterns generated for the tests clearly identify each channel individually. Any wiring errors detected can be called up over the network and are even available when performing remote diagnostics.

Scalable and safe – Scalability+

With its SafeLOGIC and SafeLOGIC-X controllers, B&R offers a safety solution that is both scalable and intelligent. Hardware components and software functions remain fully compatible, regardless of which safety controller is selected.

Avoid stress during service calls

What are the consequences if a single DIP switch on the overspeed monitor has the wrong setting? What happens if a 6 A switching device is replaced by one with 4 A? Your service technician is not likely to find these errors during functional testing, and the safety of the machine will no longer be assured. At B&R, the system takes over responsibility for a correct configuration. Necessary parameters are safely distributed and tested over the network. Your service technician will certainly appreciate this kind of relief during stressful situations.

A fast response is a good response

Until now, guaranteed safety-related response times of less than 6 ms have been limited to a few compact controllers on the market – with no integration or fieldbus capabilities. B&R is the only provider that offers this performance via the machine bus with distributed SafeIO or SafeMOTION technology and all the advantages of integrated safety.

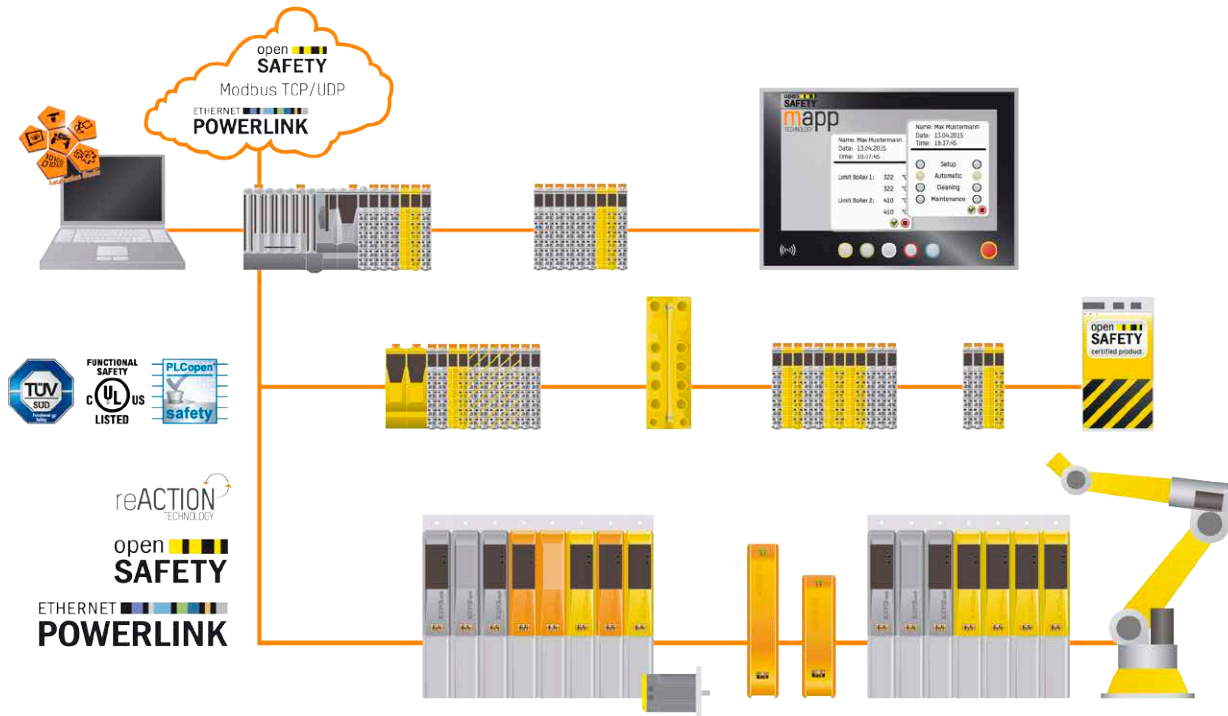
Prevent a false diagnosis

Diagnostics are necessary to ensure that the right actions are taken when an error occurs. B&R's integrated safety technology allows comprehensive diagnostics of both the safety technology as well as the standard automation components being used. This also includes specific information pertaining to the safety environment such as two-channel evaluation or an extensive logbook listing every safety-related event that occurs. And it goes without saying that these diagnostic options can also be accessed remotely.

The system at a glance

B&R's selection of integrated safety technology includes safe I/O modules (SafeIO) as well as safety controllers (SafeLOGIC) for machinery and equipment. It also includes safety solutions for motion control, such as the SafeMOTION features of its ACOPOSmulti platforms. The SafeDESIGNER tool is used to develop safety applications within Automation Studio.

Integrated safety technology is extremely versatile. X20 modules with and without safety functions can be mixed and matched as needed.



Bus modules

X20BM13, X20BM33, X20BM36, X20BM23, X20BM26



Short description	X20BM13	X20BM33	X20BM36	X20BM23	X20BM26
Bus module	Bus module, for X20 SafeIO modules, internal I/O supply continuous	Bus module, for X20 SafeIO modules, internal I/O supply continuous	Bus module, for X20 SafeIO modules, with node number switch, internal I/O supply continuous	Power supply bus module, for X20 SafeIO power supply modules, internal I/O supply interrupted to the left	Power supply bus module, for X20 SafeIO power supply modules, with node number switch, internal I/O supply interrupted to the left
General information	X20BM13	X20BM33	X20BM36	X20BM23	X20BM26
Power consumption					
Bus			0.13 W		
Internal I/O			-		
Certification					
CE			Yes		
cULus	In preparation	Yes	Yes	Yes	Yes
cCSAus HazLoc Class 1 Division 2	-	Yes	-	Yes	-
ATEX Zone 2 ¹⁾	In preparation	Yes	Yes	Yes	Yes
KC	-	Yes	-	Yes	-
GL	In preparation	Yes	In preparation	Yes	In preparation
LR	-	Yes	-	Yes	-
GOST-R			Yes		
I/O supply	X20BM13	X20BM33	X20BM36	X20BM23	X20BM26
Permitted contact load			10 A		
Environmental conditions	X20BM13	X20BM33	X20BM36	X20BM23	X20BM26
Temperature					
Operation					
Horizontal installation			-25 to 60°C		
Vertical installation			-25 to 50°C		

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Terminal blocks

X20TB52, X20TB5E, X20TB5F, X20TB72



General information	X20TB52	X20TB5E	X20TB5F	X20TB72
Certification				
CE			Yes	
cULus			Yes	
ATEX Zone 2 ¹⁾			Yes	
GL			Yes	
LR			Yes	
GOST-R			Yes	
Terminal block	X20TB52	X20TB5E	X20TB5F	X20TB72
Number of pins	12, safety-keyed	16, safety-keyed	16, safety-keyed	12, safety-keyed
Type of terminal clamp			Push-in terminal	
Push-in force per contact			Typ. 10 N	
Cable type			Only copper wires (no aluminum wires!)	
Wire stripping length			7 to 9 mm	
Connection cross section				
Solid wires	0.08 to 2.5 mm ² / 28 to 14 AWG	0.08 to 1.5 mm ² / 28 to 16 AWG	0.08 to 1.5 mm ² / 28 to 16 AWG	0.08 to 2.5 mm ² / 28 to 14 AWG
Fine strand wires	0.25 to 2.5 mm ² / 24 to 14 AWG	0.25 to 1.5 mm ² / 24 to 16 AWG	0.25 to 1.5 mm ² / 24 to 16 AWG	0.25 to 2.5 mm ² / 24 to 14 AWG
With wire end sleeves	0.25 to 1.5 mm ² / 24 to 16 AWG	0.25 to 0.75 mm ² / 24 to 20 AWG	0.25 to 0.75 mm ² / 24 to 20 AWG	0.25 to 1.5 mm ² / 24 to 16 AWG
With double wire end sleeves	Up to 2x 0.75 mm ²	-	-	Up to 2x 0.75 mm ²
Distance between contacts				
Left - Right			4.2 mm	
Above - Below	10.96 mm	8.25 mm	8.25 mm	10.96 mm
Terminal temperature compensation	-	2x PT1000 integrated in the terminal	-	-
Electrical characteristics	X20TB52	X20TB5E	X20TB5F	X20TB72
Nominal voltage	48 VAC	24 VDC	24 VDC	240 VAC
Max. voltage	48 VAC	50 VDC	50 VDC	300 VAC
Nominal current ²⁾	10 A / contact	2 A / contact	2 A / contact	10 A / contact
Contact resistance			≤5 mΩ	
Environmental conditions ³⁾	X20TB52	X20TB5E	X20TB5F	X20TB72
Temperature				
Operation			Corresponds to the X20 module used	

¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

²⁾ The limit data for each SafeIO module must be taken into consideration.

³⁾ Identical for operation, storage and transport.

X20SL8100, X20SL8101



Short description	X20SL8100	X20SL8101
Interfaces		POWERLINK
System module		CPU
General information	X20SL8100	X20SL8101
Cooling		Fanless
Power consumption	3.15 W	5.3 W
Certification		
CE		Yes
cULus		Yes
ATEX Zone 2 ¹⁾		Yes
GL		In preparation
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004	Yes	In preparation
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7	Yes	In preparation
EN 50156-1:2004	Yes	In preparation
GOST-R		Yes
Functionality	X20SL8100	X20SL8101
Communication with each other		Yes
Supports machine options		
BOOL		512
INT		64
UINT		64
DINT		64
UDINT		64
SafeMOTION support	Yes, depending on the number of operating licenses on the SafeKEY	
Shortest task class cycle time	1 ms	
Max. number of openSAFETY nodes	100, depending on the number of operating licenses on the SafeKEY	300, depending on the number of operating licenses on the SafeKEY
Max. number of POWERLINK controlled nodes	50	100
Data exchange between CPU and SL		
Max. total data width for each direction	128 bytes	
Max. number of data points for each direction		
BOOL	352 (96 + 256 extended)	
INT	30	
UINT	30	
DINT	15	
UDINT	15	
Data exchange between SL and SL		
Max. total number of data points for each direction ²⁾	16	
Max. number of data points for each direction		
BOOL	128	
INT	16	
UINT	16	
DINT	16	
UDINT	16	

X20SL8100, X20SL8101

Input SL / BC / X2X Link supply	X20SL8100	X20SL8101
Input voltage		24 VDC -15% / +20%
Input current	Max. 0.25 A	Max. 0.9 A
Fuse	-	Integrated, cannot be replaced
Reverse polarity protection		Yes
Output SL / BC / X2X Link supply	X20SL8100	X20SL8101
Nominal output power	-	7 W
Parallel operation	-	Yes ³⁾
Redundant operation	-	Yes
Overload behavior	-	Short circuit protection, temporary overload
Input I/O supply	X20SL8100	X20SL8101
Input voltage	-	24 VDC -15% / +20%
Fuse	-	Required line fuse: Max. 10 A, slow-blow
Output I/O supply	X20SL8100	X20SL8101
Nominal output voltage	-	24 VDC
Permitted contact load	-	10 A
Interfaces	X20SL8100	X20SL8101
Fieldbus		POWERLINK controlled node
Design		2x shielded RJ45 port (hub)
Cable length		Max. 100 m between 2 nodes (segment length)
Transfer rate		100 Mbit/s
Transmission		
Physical layer		100BASE-TX
Half-duplex		Yes
Full-duplex		No
Autonegotiation		Yes
Auto-MDI / MDIX		Yes
Min. cycle time ⁴⁾		
Fieldbus		200 µs
X2X Link	-	200 µs
Synchronization between bus systems possible	-	Yes
Environmental conditions	X20SL8100	X20SL8101
Temperature		
Operation		
Horizontal installation	0 to 60°C	0 to 60°C, see Derating
Vertical installation		0 to 45°C
Mechanical characteristics	X20SL8100	X20SL8101
Note	Order SafeKEY and SafeLOGIC functionality using the X20MK configurator X20 locking plate (right) included in delivery X20 terminal block, 12-pin, safety-keyed, included in delivery SafeKEY cover included in delivery	
Dimensions		
Width		62.5 ^{+0.2} mm
Height		99 mm
Depth		75 mm

¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

²⁾ Keep in mind that 8 BOOL count as 1 data point.

³⁾ In parallel operation, only 75% of the rated power can be assumed. It is important to make sure that all power supplies operated in parallel are switched on and off at the same time.

⁴⁾ The minimum cycle time defines how far the bus cycle can be reduced without communication errors occurring.

Intelligent programmable modules

X20SLX210, X20SLX410, X20SLX811, X20SLX910



Short description	X20SLX210	X20SLX410	X20SLX811	X20SLX910
I/O module	2 safe digital inputs, 2 pulse outputs, 24 VDC, SafeLOGIC-X technology	4 safe digital inputs, 4 pulse outputs, 24 VDC, SafeLOGIC-X technology	8 safe digital inputs, 4 pulse outputs, 24 VDC, SafeLOGIC-X technology	20 safe digital inputs, 4 pulse outputs, 24 VDC, SafeLOGIC-X technology
General information	X20SLX210	X20SLX410	X20SLX811	X20SLX910
Power consumption				
Bus	0.25 W	0.32 W	0.4 W	0.4 W
Internal I/O	1 W	1.25 W	2.5 W	1.6 W
Certification				
CE			Yes	
cULus	Yes	Yes	In preparation	Yes
ATEX Zone 2 ¹⁾	Yes	Yes	In preparation	Yes
KC	Yes	Yes	-	Yes
GL			In preparation	
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004	Yes	Yes	In preparation	Yes
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7	Yes	Yes	In preparation	Yes
EN 50156-1:2004	Yes	Yes	In preparation	Yes
GOST-R			Yes	
Functionality	X20SLX210	X20SLX410	X20SLX811	X20SLX910
Communication with each other	Communication only possible with a SafeLOGIC X20SL81xx			
Supports machine options				
BOOL			64	
INT			-	
UINT			-	
DINT			-	
UDINT			-	
SafeMOTION support			Yes	
Shortest task class cycle time			2 ms	
Max. number of openSAFETY nodes			10	
Max. number of POWERLINK controlled nodes	Depending on the POWERLINK connection (bus controller or CPU)			
Data exchange between CPU and SL				
Max. total data width for each direction			8 bytes	
Max. number of data points for each direction				
BOOL			64	
INT			4	
UINT			4	
DINT			2	
UDINT			2	

X20SLX210, X20SLX410, X20SLX811, X20SLX910

Data exchange between SL and SL

Max. total number of data points for each direction ²⁾ 2

Max. number of data points for each direction

BOOL	16
INT	2
UINT	2
DINT	2
UDINT	2

Safe digital inputs	X20SLX210	X20SLX410	X20SLX811	X20SLX910
Nominal voltage	24 VDC			
Input filter				
Hardware	≤150 µs			
Software	Configurable between 0 and 500 ms			
Input circuit	Sink			
Cable length	Max. 50 m			
Pulse outputs	X20SLX210	X20SLX410	X20SLX811	X20SLX910
Nominal output current	50 mA			
Cable length	Max. 50 m			
Environmental conditions	X20SLX210	X20SLX410	X20SLX811	X20SLX910
Temperature				
Operation	0 to 60°C, see Derating			
Horizontal installation	0 to 50°C			
Vertical installation	0 to 50°C	0 to 50°C	0 to 50°C, see Derating	0 to 50°C, see Derating
Mechanical characteristics	X20SLX210	X20SLX410	X20SLX811	X20SLX910
Note	Order 1x X20TB52 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately	Order 1x X20TB52 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately	Order 1x X20TB52 safety-keyed terminal block separately Order 1x X20BM13 safety-keyed bus module separately	Order 2x X20TB52 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately

¹⁾ Ta min.: 0°C

Ta max.: See environmental conditions

²⁾ Keep in mind that 8 BOOL count as 1 data point.

Intelligent programmable modules

X20SLX402, X20SLX806, X20SLX842



Short description	X20SLX402	X20SLX806	X20SLX842
I/O module	4 safe digital inputs, 4 pulse outputs, 24 VDC, 2 safe digital type B outputs, 24 VDC, 0.2 A, OSSD <10 µs, SafeLOGIC-X technology	8 safe digital inputs, 4 pulse outputs, 24 VDC, 6 safe digital type B outputs, 24 VDC, 0.2 A, OSSD <10 µs, SafeLOGIC-X technology	8 safe digital inputs, 4 pulse outputs, 24 VDC, 4 safe digital type A outputs, 24 VDC, 3 A, OSSD <500 µs, 2 safe digital type B outputs, 24 VDC, 50 mA, OSSD <500 µs, SafeLOGIC-X technology
General information	X20SLX402	X20SLX806	X20SLX842
Power consumption			
Bus		0.4 W	
Internal I/O		2.5 W	
Certification			
CE		Yes	
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004		In preparation	
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7		In preparation	
EN 50156-1:2004		In preparation	
GOST-R		Yes	
Functionality	X20SLX402	X20SLX806	X20SLX842
Communication with each other		Communication only possible with a SafeLOGIC X20SL81xx	
Supports machine options			
BOOL		64	
INT		-	
UINT		-	
DINT		-	
UDINT		-	
SafeMOTION support		Yes	
Shortest task class cycle time		2 ms	
Max. number of openSAFETY nodes		10	
Max. number of POWERLINK controlled nodes		Depending on the POWERLINK connection (bus controller or CPU)	
Data exchange between CPU and SL			
Max. total data width for each direction		8 bytes	
Max. number of data points for each direction			
BOOL		64	
INT		4	
UINT		4	
DINT		2	
UDINT		2	
Data exchange between SL and SL			
Max. total number of data points for each direction ¹⁾		2	
Max. number of data points for each direction			
BOOL		16	
INT		2	
UINT		2	
DINT		2	
UDINT		2	

X20SLX402, X20SLX806, X20SLX842

Safe digital inputs	X20SLX402	X20SLX806	X20SLX842
Nominal voltage		24 VDC	
Input filter			
Hardware		≤150 µs	
Software		Configurable between 0 and 500 ms	
Input circuit		Sink	
Cable length		Max. 50 m	
Safe digital HS-LS outputs	X20SLX402	X20SLX806	X20SLX842
Design	-	-	FET, 1x n switching, 1x p switching, type A, output level can be read
Nominal voltage	-	-	24 VDC
Nominal output current	-	-	3 A
Total nominal current	-	-	10 A ²⁾
Output protection	-	-	Thermal short circuit cutoff, integrated protection for switching inductances ³⁾
Safe digital HS-HS outputs	X20SLX402	X20SLX806	X20SLX842
Design		FET, 2x n switching, type B, output level can be read	
Nominal voltage		24 VDC	
Nominal output current	0.2 A	0.2 A	50 mA
Total nominal current	0.4 A	1.2 A	100 mA
Output protection		Active cutoff if overcurrent or short circuit occurs, integrated protection for switching inductances ³⁾	
Pulse outputs	X20SLX402	X20SLX806	X20SLX842
Nominal output current		50 mA	
Cable length		Max. 50 m	
Environmental conditions	X20SLX402	X20SLX806	X20SLX842
Temperature			
Operation			
Horizontal installation		0 to 60°C, see Derating	
Vertical installation		0 to 50°C, see Derating	
Mechanical characteristics	X20SLX402	X20SLX806	X20SLX842
Note		Order 2x X20TB52 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately	

¹⁾ Keep in mind that 8 BOOL count as 1 data point.

²⁾ The module's total nominal current is limited to 10 A. The output currents for the group "Safe digital HS-HS outputs" must be included in the total current.

³⁾ Protection is provided for max. 30 minutes for continuous short circuits.

Power supply modules

X20SP1130



Short description

I/O module	1 safe digital output, 24 VDC, 10 A, without OSSD, be aware of the list of permitted modules in the potential group
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General information

Power consumption	
Bus	0.2 W
Internal I/O	1.5 W
Certification	
CE	Yes
cULus	Yes
KC	Yes
GL	In preparation
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004	Yes
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7	Yes
EN 50156-1:2004	Yes
GOST-R	Yes

Safe digital outputs

Design	2 FETs in series, output level can be read
Nominal voltage	24 VDC
Nominal output current	10 A
Output protection	Protection for switching inductances ¹⁾
Minimum load	15 mA

Environmental conditions

Temperature	
Operation	
Horizontal installation	0 to 60°C, see Derating
Vertical installation	0 to 50°C, see Derating

Mechanical characteristics

Note	Order 1x X20TB52 safety-keyed terminal block separately Order 1x X20BM23 safety-keyed bus module separately
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¹⁾ Protection is provided for max. 30 minutes for continuous short circuits.

Digital input modules

X20SI2100, X20SI4100, X20SI8110, X20SI9100



Short description	X20SI2100	X20SI4100	X20SI8110	X20SI9100
I/O module	2 safe digital inputs, 2 pulse outputs, 24 VDC	4 safe digital inputs, 4 pulse outputs, 24 VDC	8 safe digital inputs, 4 pulse outputs, 24 VDC	20 safe digital inputs, 4 pulse outputs, 24 VDC
General information	X20SI2100	X20SI4100	X20SI8110	X20SI9100
Power consumption				
Bus	0.25 W	0.32 W	0.4 W	0.4 W
Internal I/O	1 W	1.25 W	2.5 W	1.6 W
Certification				
CE			Yes	
cULus	Yes	Yes	In preparation	Yes
cCSAus HazLoc Class 1 Division 2	Yes	Yes	-	-
ATEX Zone 2 ¹⁾	Yes	Yes	In preparation	Yes
KC	Yes	Yes	-	Yes
GL	Yes	Yes	In preparation	In preparation
LR	Yes	Yes	-	-
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004	Yes	Yes	In preparation	Yes
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7	Yes	Yes	In preparation	Yes
EN 50156-1:2004	Yes	Yes	In preparation	Yes
GOST-R			Yes	
Safe digital inputs	X20SI2100	X20SI4100	X20SI8110	X20SI9100
Nominal voltage	24 VDC			
Input filter				
Hardware	≤150 μs			
Software	Configurable between 0 and 500 ms			
Input circuit	Sink			
Cable length	Max. 50 m			
Pulse outputs	X20SI2100	X20SI4100	X20SI8110	X20SI9100
Nominal output current	100 mA, starting with hardware revision J0: 50 mA	100 mA, starting with hardware revision J0: 50 mA	50 mA	50 mA
Cable length	Max. 50 m			
Environmental conditions	X20SI2100	X20SI4100	X20SI8110	X20SI9100
Temperature				
Operation	0 to 60°C, see Derating			
Horizontal installation	0 to 60°C, see Derating			
Vertical installation	0 to 50°C	0 to 50°C	0 to 50°C, see Derating	0 to 50°C, see Derating
Mechanical characteristics	X20SI2100	X20SI4100	X20SI8110	X20SI9100
Note	Order 1x X20TB52 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately	Order 1x X20TB52 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately	Order 1x X20TB52 safety-keyed terminal block separately Order 1x X20BM13 safety-keyed bus module separately	Order 2x X20TB52 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Digital output modules

X20SO2110, X20SO2120, X20SO4110, X20SO4120



Short description	X20SO2110	X20SO2120	X20SO4110	X20SO4120
I/O module	2 safe digital type A outputs, with current monitoring, 24 VDC, 0.5 A, OSSD <500 µs		4 safe digital type A outputs, with current monitoring, 24 VDC, 0.5 A, OSSD <500 µs	
General information	X20SO2110	X20SO2120	X20SO4110	X20SO4120
Power consumption				
Bus			0.25 W	
Internal I/O	0.98 W	0.98 W	1.3 W	1.3 W
Certification				
CE			Yes	
cULus			Yes	
cCSAus HazLoc Class 1 Division 2			Yes	
ATEX Zone 2 ¹⁾			Yes	
KC			Yes	
GL			Yes	
LR			Yes	
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004			Yes	
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7			Yes	
EN 50156-1:2004			Yes	
GOST-R			Yes	
Safe digital outputs	X20SO2110	X20SO2120	X20SO4110	X20SO4120
Design	FET, 1x n switching, 1x p switching, type A, output level can be read, open line detection			
Nominal voltage	24 VDC			
Nominal output current	0.5 A	2 A	0.5 A	2 A
Total nominal current	1 A	4 A	2 A	5 A
Output protection	Thermal cutoff if overcurrent or short circuit occurs, integrated protection for switching inductances ²⁾			
Environmental conditions	X20SO2110	X20SO2120	X20SO4110	X20SO4120
Temperature				
Operation				
Horizontal installation			0 to 60°C, see Derating	
Vertical installation			0 to 50°C, see Derating	
Mechanical characteristics	X20SO2110	X20SO2120	X20SO4110	X20SO4120
Note	Order 1x X20TB52 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately			

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Protection is provided for max. 30 minutes for continuous short circuits.

X20SO6300



Short description

I/O module	6 safe digital type B outputs, 24 VDC, 0.2 A, OSSD <10 μs
------------	---

General information

Power consumption	
Bus	0.32 W
Internal I/O	1.4 W

Certification	
CE	Yes
cULus	Yes
cCSAus HazLoc Class 1 Division 2	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	In preparation
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004	Yes
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7	Yes
EN 50156-1:2004	Yes
GOST-R	Yes

Safe digital outputs

Design	FET, 2x n switching, type B, output level can be read
Nominal voltage	24 VDC
Nominal output current	0.2 A
Total nominal current	1.2 A
Output protection	Active cutoff if overcurrent or short circuit occurs, integrated protection for switching inductances ²⁾

Environmental conditions

Temperature	
Operation	
Horizontal installation	0 to 60°C, see Derating
Vertical installation	0 to 50°C, see Derating

Mechanical characteristics

Note	Order 1x X20TB52 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately
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¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Protection is provided for max. 30 minutes for continuous short circuits.

Digital mixed modules

X20SC2212



Short description

I/O module	6 safe digital inputs, 6 pulse outputs, 24 VDC, 2 safe digital type B outputs, 24 VDC, 0.5 A, OSSD <500 µs
------------	--

General information

Power consumption	
Bus	0.25 W
Internal I/O	1.4 W

Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	In preparation
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004	Yes
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7	Yes
EN 50156-1:2004	Yes
GOST-R	Yes

Safe digital inputs

Nominal voltage	24 VDC
Input filter	
Hardware	≤150 µs
Software	Configurable between 0 and 500 ms
Input circuit	Sink
Cable length	Max. 50 m

Safe digital outputs

Design	FET, 2x n switching, type B, output level can be read
Nominal voltage	24 VDC
Nominal output current	0.5 A
Total nominal current	1 A
Output protection	Thermal short circuit cutoff, integrated protection for switching inductances ²⁾

Pulse outputs

Nominal output current	20 mA
Cable length	Max. 50 m

Environmental conditions

Temperature	
Operation	
Horizontal installation	0 to 60°C, see Derating
Vertical installation	0 to 50°C, see Derating

Mechanical characteristics

Note	Order 1x X20TB5F safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately
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¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

²⁾ Protection is provided for max. 30 minutes for continuous short circuits.

X20SC0402, X20SC0806, X20SC0842



Short description	X20SC0402	X20SC0806	X20SC0842
I/O module	4 safe digital inputs, 4 pulse outputs, 24 VDC, 2 safe digital type B outputs, 24 VDC, 0.2 A, OSSD <10 µs	8 safe digital inputs, 4 pulse outputs, 24 VDC, 6 safe digital type B outputs, 24 VDC, 0.2 A, OSSD <10 µs	8 safe digital inputs, 4 pulse outputs, 24 VDC, 4 safe digital type A outputs, 24 VDC, 3 A, OSSD <500 µs, 2 safe digital type B outputs, 24 VDC, 50 mA, OSSD <500 µs
General information	X20SC0402	X20SC0806	X20SC0842
Power consumption			
Bus		0.4 W	
Internal I/O		2.5 W	
Certification			
CE		Yes	
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004		In preparation	
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7		In preparation	
EN 50156-1:2004		In preparation	
GOST-R		Yes	
Safe digital inputs	X20SC0402	X20SC0806	X20SC0842
Nominal voltage		24 VDC	
Input filter			
Hardware		≤150 µs	
Software		Configurable between 0 and 500 ms	
Input circuit		Sink	
Cable length		Max. 50 m	
Safe digital HS-LS outputs	X20SC0402	X20SC0806	X20SC0842
Design	-	-	FET, 1x n switching, 1x p switching, type A, output level can be read
Nominal voltage	-	-	24 VDC
Nominal output current	-	-	3 A
Total nominal current	-	-	10 A ¹⁾
Output protection	-	-	Thermal short circuit cutoff, integrated protection for switching inductances ²⁾
Safe digital HS-HS outputs	X20SC0402	X20SC0806	X20SC0842
Design		FET, 2x n switching, type B, output level can be read	
Nominal voltage		24 VDC	
Nominal output current	0.2 A	0.2 A	50 mA
Total nominal current	0.4 A	1.2 A	100 mA
Output protection		Active cutoff if overcurrent or short circuit occurs, integrated protection for switching inductances ²⁾	
Pulse outputs	X20SC0402	X20SC0806	X20SC0842
Nominal output current		50 mA	
Cable length		Max. 50 m	

Digital mixed modules

X20SC0402, X20SC0806, X20SC0842

Environmental conditions	X20SC0402	X20SC0806	X20SC0842
Temperature			
Operation			
Horizontal installation		0 to 60°C, see Derating	
Vertical installation		0 to 50°C, see Derating	
Mechanical characteristics	X20SC0402	X20SC0806	X20SC0842
Note		Order 2x X20TB52 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately	

¹⁾ The module's total nominal current is limited to 10 A. The output currents for the group „Safe digital HS-HS outputs“ must be included in the total current.

²⁾ Protection is provided for max. 30 minutes for continuous short circuits.

Relay modules

X20SC2432, X20SO2530



Short description

X20SC2432

X20SO2530

I/O module	2 safe digital inputs, 2 pulse outputs, 24 VDC, 2 relays, each with 1 normally open contact, 48 VAC / 6 A, 24 VDC / 6 A	2 relays, each with 1 normally open contact, 230 VAC / 6 A, 24 VDC / 6 A
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General information

X20SC2432

X20SO2530

Power consumption		
Bus		0.26 W
Internal I/O		1.15 W
Certification		
CE		Yes
cULus		Yes
ATEX Zone 2 ¹⁾		Yes
KC	Yes	-
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004	Yes	-
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004	-	Yes
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7		Yes
EN 50156-1:2004		Yes
GOST-R		Yes

Safe digital inputs

X20SC2432

X20SO2530

Nominal voltage	24 VDC	-
Input filter		
Hardware	≤150 μs	-
Software	Configurable between 0 and 500 ms	-
Input circuit	Sink	-
Cable length	Max. 50 m	-

Relay outputs

X20SC2432

X20SO2530

Design	2 relays, each with 1 normally open contact, internal high-side and low-side control	
Switching voltage range	5 to 24 VDC, 5 to 48 VAC	5 to 24 VDC, 5 to 230 VAC
Switching current range		5 mA to 6 A
Deceleration		<50 ms

Pulse outputs

X20SC2432

X20SO2530

Nominal output current	50 mA	-
Cable length	Max. 50 m	-

Environmental conditions

X20SC2432

X20SO2530

Temperature		
Operation		
Horizontal installation		0 to 60°C, see Derating
Vertical installation		0 to 50°C, see Derating

Mechanical characteristics

X20SC2432

X20SO2530

Note	Order 1x X20TB52 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately	Order 1x X20TB72 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately
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¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Analog input modules

X20SA4430



Short description

I/O module	2x 2 safe analog inputs, 4 to 20 mA, each channel electrically isolated
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General information

Power consumption	
Bus	0.25 W
Internal I/O	1.7 W

Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	In preparation
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004	Yes
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7	Yes
EN 50156-1:2004	Yes
GOST-R	Yes

Analog inputs

Input	4 to 20 mA (valid measurement range), 0.5 to 25 mA (input range)
Input type	Differential input
Digital converter resolution	24-bit
Conversion time	See section "I/O update time"
Output format	SAFEINT
Load	Up to rev. D3: 230 to 420 Ω , starting with rev. E0: 185 to 245 Ω
Input protection	Protection against external supply voltages and overcurrent
Open line detection	Yes, using software
Max. error at 25°C	
Gain	
4 to 20 mA	<0.08% ²⁾
Offset	
4 to 20 mA	<0.03% ³⁾
Resolution	1 μ A/LSB
Filter time	Configurable between 1 and 66.7 ms

Sensor supply

Nominal voltage	29 VDC \pm 5%
Nominal output current	Max. 60 mA

Environmental conditions

Temperature	
Operation	
Horizontal installation	0 to 60°C, see Derating
Vertical installation	0 to 40°C, see Derating

Mechanical characteristics

Note	Order 1x X20TB5F safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately
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- ¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions
- ²⁾ Based on the current measured value
- ³⁾ Based on the 16 mA measurement range

Temperature measurement modules

X20ST4492



Short description

I/O module	2x 2 safe analog inputs for thermocouples, 1x 2 safe analog inputs for PT100/PT1000 sensors, channel pairs electrically isolated, integrated terminal temperature compensation, temperature sensor integrated in X20TB5E terminal block
------------	---

General information

Power consumption	
Bus	0.25 W
Internal I/O	1.2 W
Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
KC	Yes
GL	In preparation
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004	Yes
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7	Yes
EN 50156-1:2004	Yes
GOST-R	Yes

Thermocouple temperature inputs

Input	Thermocouple
Digital converter resolution	24-bit
Filter time	Configurable between 1 and 66.7 ms
Output format	SAFEINT
Measurement range	
Sensor temperature	
Type J: Fe-CuNi	-210.0 to 1200.0°C
Type K: NiCr-Ni	-270.0 to 1372.0°C
Type N: NiCrSi-NiSi	-270.0 to 1300.0°C
Type S: PtRh10-Pt	-50.0 to 1768.0°C
Type R: PtRh13-Pt	-50.0 to 1768.0°C
Type C: WRe5-WRe26	0 to 2320.0°C
Type T: Cu-CuNi	-270.0 to 400.0°C
Voltage	±65 mV
Max. internal resistance of the source during voltage measurement	20 Ω
Terminal temperature compensation	Internal / External

Temperature inputs resistance measurement

Measurement range	
PT100	Firmware version 295: -40.0 to 130.0°C, beginning with firmware version 301: -200.0 to 850.0°C
PT1000	Firmware version 295: -40.0 to 130.0°C, beginning with firmware version 301: -200.0 to 850.0°C
Max. cable length	50 m
Max. line resistance	5 Ω

Environmental conditions

Temperature	
Operation	
Horizontal installation	0 to 60°C
Vertical installation	0 to 50°C

Mechanical characteristics

Note	Order 1x X20TB5F or 1x X20TB5E safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately
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¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

Counter and positioning modules

X20SD1207



Short description

I/O module	1 safe digital counter channel, 7 kHz, 24 VDC
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General information

Power consumption	
Bus	0.25 W
Internal I/O	0.75 W

Certification	
CE	Yes
cULus	Yes
ATEX Zone 2 ¹⁾	Yes
GL	In preparation
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004	Yes
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7	Yes
EN 50156-1:2004	Yes
GOST-R	Yes

Encoder supply

Output voltage	Module supply minus residual voltage
Nominal output current	80 mA
Residual voltage	<0.4 VDC
Protective measures	
Short circuit protection	Thermal limit determined by PTC

Safe digital counter inputs

Nominal voltage	24 VDC
Input filter	
Hardware	<10 μ s
Software	Configurable between 0 and 100 s
Input frequency	Max. 7 kHz
Input circuit	Sink
Input voltage	24 VDC -15% / +20%
Cable length	Max. 30 m shielded

Environmental conditions

Temperature	
Operation	
Horizontal installation	0 to 60°C, see Derating
Vertical installation	0 to 50°C

Mechanical characteristics

Note	Order 1x X20TB52 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately
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¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

X20SRT402, X20SRT806, X20SRT842



Short description	X20SRT402	X20SRT806	X20SRT842
I/O module	4 safe digital inputs, 4 pulse outputs, 24 VDC, 2 safe digital type B outputs, 24 VDC, 0.2 A, OSSD <10 µs, reACTION technology	8 safe digital inputs, 4 pulse outputs, 24 VDC, 6 safe digital type B outputs, 24 VDC, 0.2 A, OSSD <10 µs, reACTION technology	8 safe digital inputs, 4 pulse outputs, 24 VDC, 4 safe digital type A outputs, 24 VDC, 3 A, OSSD <500 µs, 2 safe digital type B outputs, 24 VDC, 50 mA, OSSD <500 µs, reACTION technology
General information	X20SRT402	X20SRT806	X20SRT842
Power consumption			
Bus		0.4 W	
Internal I/O		2.5 W	
Certification			
CE		Yes	
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004		In preparation	
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7		In preparation	
EN 50156-1:2004		In preparation	
GOST-R		Yes	
Safe digital inputs	X20SRT402	X20SRT806	X20SRT842
Nominal voltage		24 VDC	
Input filter			
Hardware		≤150 µs	
Software		Configurable between 0 and 500 ms	
Input circuit		Sink	
Cable length		Max. 50 m	
Safe digital HS-LS outputs	X20SRT402	X20SRT806	X20SRT842
Design	-	-	FET, 1x n switching, 1x p switching, type A, output level can be read
Nominal voltage	-	-	24 VDC
Nominal output current	-	-	3 A
Total nominal current	-	-	10 A ¹⁾
Output protection	-	-	Thermal short circuit cutoff, integrated protection for switching inductances ²⁾
Safe digital HS-HS outputs	X20SRT402	X20SRT806	X20SRT842
Design		FET, 2x n switching, type B, output level can be read	
Nominal voltage		24 VDC	
Nominal output current	0.2 A	0.2 A	50 mA
Total nominal current	0.4 A	1.2 A	100 mA
Output protection		Active cutoff if overcurrent or short circuit occurs, integrated protection for switching inductances ²⁾	
Pulse outputs	X20SRT402	X20SRT806	X20SRT842
Nominal output current		50 mA	
Cable length		Max. 50 m	

X20SRT402, X20SRT806, X20SRT842

Environmental conditions	X20SRT402	X20SRT806	X20SRT842
Temperature			
Operation			
Horizontal installation		0 to 60°C, see Derating	
Vertical installation		0 to 50°C, see Derating	
Mechanical characteristics	X20SRT402	X20SRT806	X20SRT842
Note		Order 2x X20TB52 safety-keyed terminal block separately Order 1x X20BM33 safety-keyed bus module separately	

¹⁾ The module's total nominal current is limited to 10 A. The output currents for the group „Safe digital HS-HS outputs“ must be included in the total current.

²⁾ Protection is provided for max. 30 minutes for continuous short circuits.

Digital input modules

X67SI8103



Short description

I/O module	2x M12 interface each with 2 safe digital inputs and 2 pulse outputs, 24 VDC 2x standardized 8-pin M12 device interface each with 1 digital input without safety function and 2 safe digital inputs and 2 pulse outputs, 24 VDC and 1 digital output without safety function, 24 VDC, 0.6 A and 1 device power supply, 24 VDC, 2 A
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General information

Connection type	
X2X Link	M12, B-keyed
Inputs/Outputs	M12 8-pin or M12 5-pin, A-keyed
I/O supply	M8, 4-pin
Power consumption	
Bus	0.9 W
Internal I/O	2.1 W
Certification	
CE	Yes
cULus	Yes
KC	Yes
FSP	Yes
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004	Yes
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSPC, FSPC7	Yes
EN 50156-1:2004	Yes
GOST-R	Yes

24 VDC output

Output voltage	24 VDC -15% / +20%
Output current	2 A

Digital inputs

Nominal voltage	24 VDC
Input filter	
Hardware	≤150 μs
Input circuit	Sink

Safe digital inputs

Nominal voltage	24 VDC
Input filter	
Hardware	≤150 μs
Software	Configurable between 0 and 500 ms
Input circuit	Sink
Cable length	Max. 50 m

Digital outputs

Design	FET, positive switching, output level can be read
Nominal output current	0.6 A
Total nominal current	1.2 A
Output protection	Thermal cutoff of individual channels if overcurrent or short circuit occurs, integrated protection for switching inductances ¹⁾
Peak output current	1 A

Pulse outputs

Nominal output current	40 mA
Cable length	Max. 50 m

Environmental conditions

Temperature	
Operation	0 to 60°C

Digital input modules

X67SI8103

Mechanical characteristics

Dimensions

Width	53 mm
Height	85 mm
Depth	42 mm

¹⁾ Protection is provided for max. 30 minutes for continuous short circuits.

Digital mixed modules

X67SC4122.L12



Short description

I/O module	8 safe digital inputs, 8 pulse outputs, 24 VDC, 4 safe digital type B outputs, 24 VDC, 2 A, OSSD <500 µs
------------	--

General information

Connection type	
X2X Link	M12, B-keyed
Inputs/Outputs	M12, A-keyed
I/O supply	M8, 4-pin
Power consumption	
Bus	0.8 W
Internal I/O	1.8 W
Certification	
CE	Yes
cULus	Yes
KC	Yes
FSP	Yes
EN IEC 61508:2010, EN IEC 62061:2010, EN ISO 13849-1:2008, EN IEC 61511:2004	Yes
ANSI UL 1998:2008, NFPA 79:2015, NFPA 85:2015, UL category FSFC, FSFC7	Yes
EN 50156-1:2004	Yes
GOST-R	Yes

Safe digital inputs

Nominal voltage	24 VDC
Input filter	
Hardware	≤150 µs
Software	Configurable between 0 and 500 ms
Input circuit	Sink
Cable length	Max. 50 m

Safe digital outputs

Design	FET, 2x n switching, type B, output level can be read
Nominal voltage	24 VDC
Nominal output current	2 A
Total nominal current	5 A
Output protection	Thermal cutoff of individual channels if overcurrent or short circuit occurs, integrated protection for switching inductances ¹⁾
Minimum load	12 mA

Pulse outputs

Nominal output current	50 mA
Nominal voltage	24 VDC
Cable length	Max. 50 m

Environmental conditions

Temperature	
Operation	0 to 60°C

Mechanical characteristics

Dimensions	
Width	53 mm
Height	155 mm
Depth	42 mm

¹⁾ Protection is provided for max. 30 minutes for continuous short circuits.

Safety Technology Guarding

"Safety Technology Guarding" defines the range of functions available for applications using X20SL81xx-series SafeLOGIC controllers. Licenses are stored on a SafeKEY dongle. The functions required for given application are implemented by selecting a SafeKEY with a sufficient amount of memory and defining the respective technology functions in the X20MK configurator. Each solution is delivered exclusively as a set consisting of the SafeKEY and the activated licenses for the selected technology functions.

Storage medium



Model number	Short description
X20MK0211	X20 SafeKEY, 2 MB, for the X20SL81xx series
X20MK0213	X20 SafeKEY, 8 MB, for the X20SL81xx series

Technology functions



Model number	Short description
X20SF0001	SafeLOGIC 20 SN base, for projects with up to 20 openSAFETY nodes; actual number determined in the SafeDESIGNER project; Each module and each instance of SafeLOGIC-to-SafeLOGIC communication with a link to global variables counts as a node.
X20SF0002	SafeLOGIC 100 SN extension, for projects with up to 100 openSAFETY nodes; actual number determined in the SafeDESIGNER project; Each module and each instance of SafeLOGIC-to-SafeLOGIC communication with a link to global variables counts as a node.
X20SF0003	SafeLOGIC 300 SN base, for projects with up to 300 openSAFETY nodes; actual number determined in the SafeDESIGNER project; Each module and each instance of SafeLOGIC-to-SafeLOGIC communication with a link to global variables counts as a node.
X20SF1101	SafeMOTION base functions, for projects with SafeMOTION functions, access to the following SafeDESIGNER libraries: PLCopen_Motion_SF_2, openSAFETY_Motion_SF
X20SF1102	SafeROBOTICS base functions, for projects with SafeROBOTICS functions, implicitly contains a license for X20SF1101 SafeMOTION base functions, access to the following SafeDESIGNER libraries: PLCopen_Motion_SF_2, openSAFETY_Motion_SF, RoboticCtrl_SF_3
X20SF2101	Press Control Utilities, for press applications, access to the following SafeDESIGNER libraries: PLCopen_Press_SF
X20SF2102	Safe Remanent Data, for storing remanent data on the SafeKEY, access to the following SafeDESIGNER library functions: Utilities_SF/SF_RemmanentData_SAFEDWORD, Utilities_SF/SF_RemmanentData_SAFEDINT
X20SF2104	C Programming Extension, support for function blocks created using SafeDESIGNER's C programming extension

Since all integrated safety technology products are seamlessly integrated in the X20 system, all X20 accessories are also available for X20 safety modules.

For X20 system accessories, please see page 146.






Valve connections

Space-saving peripheral connections

B&R provides tailored solutions that integrate pneumatic valves from a wide variety of vendors.

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Product overview



XV108 valve connections

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XV116 valve connections

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XV124 valve connections

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Direct fieldbus connection on the valve

XV valve connections allow pneumatic valves from most well-known manufacturers to be integrated directly into an automation system. Up to 24 digital outputs – for up to 24 valves – are available in a compact housing.



For all pneumatic valves

These valves also make use of the 25-pin connector preferred by all leading manufacturers. Valve terminals from Bürkert, Festo, Rexroth, Norgren, SMC and many others can be added to an already networked environment with very little configuration.

Excellent integration

This compact solution provides users considerable opportunities for savings. For example, the reduced wiring of a large number of valves cuts back on the amount of work it takes to set up and maintain a project. In addition, the different number of channels available on the various valve terminal connections makes it possible to set up connections to all types of valves at a very low cost.

Selection guide

Selection table

Valve connections	7XV108.50-11	7XV108.50-12	7XV116.50-11	7XV116.50-12	7XV116.50-01	7XV124.50-11	7XV124.50-12
Number of valves	8	8	16	16	16	24	24
GND pin	22,23,24,25	13,22,23,24,25	22,23,24,25	13,22,23,24,25	22,23,24,25	25	13
Protection	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Bus connection	11-pin	11-pin	11-pin	11-pin	10-pin	11-pin	11-pin
Power supply	Bus connection	Bus connection	Bus connection	Bus connection	Bus connection	Bus connection	Bus connection

Selection table

Valve connections	7XV108.50-51	7XV108.50-62	7XV116.50-51	7XV116.50-62	7XV124.50-51	7XV124.50-61	7XV124.50-62
Number of valves	8	8	16	16	24	24	24
GND pin	22,23,24,25	13,22,23,24,25	22,23,24,25	13,22,23,24,25	25	25	13
Protection	IP67	IP67	IP67	IP67	IP67	IP67	IP67
Bus connection	M12	M12	M12	M12	M12	M12	M12
Power supply	M8	M8	M8	M8	M8	M8	M8

XV108 valve connections

7XV108.50-11, 7XV108.50-12, 7XV108.50-51, 7XV108.50-62



General information	7XV108.50-11	7XV108.50-12	7XV108.50-51	7XV108.50-62
Power consumption	Max. 0.75 W	Max. 0.75 W	-	-
Input capacitance				
Module supply	47 µF / 7.5 Ω	47 µF / 7.5 Ω	-	-
I/O supply	47 µF	47 µF	-	-
Power consumption				
Internal I/O	-	-	Max. 1.5 W (without load)	Max. 1.5 W (without load)
X2X Link supply	-	-	Max. 0.75 W	Max. 0.75 W
Remote valve terminal connection for 25-pin DSUB multi-pin connection			8 valves	
Certification				
CE			Yes	
cULus			Yes	
ATEX Zone 2 ¹⁾	-	-	Yes	Yes
GOST-R			Yes	
Wiring	7XV108.50-11	7XV108.50-12	7XV108.50-51	7XV108.50-62
Bus connection	11-pin	11-pin	M12	M12
GND pin	22, 23, 24, 25	13, 22, 23, 24, 25	22, 23, 24, 25	13, 22, 23, 24, 25
Power supply	Bus connection	Bus connection	M8	M8
Digital outputs	7XV108.50-11	7XV108.50-12	7XV108.50-51	7XV108.50-62
Switching voltage			24 VDC -25% / +25%	
Total nominal current			0.8 A	
Output circuit			Source	
Output protection			Protected against short circuit, overload and overtemperature	
Type			High-side driver (source)	
Max. output current			0.1 A	
Max. switching frequency			100 Hz	
Operating conditions	7XV108.50-11	7XV108.50-12	7XV108.50-51	7XV108.50-62
EN 60529 protection	IP20	IP20	IP67	IP67
Environmental conditions	7XV108.50-11	7XV108.50-12	7XV108.50-51	7XV108.50-62
Temperature				
Operation	0 to 55°C	0 to 55°C	0 to 55°C (in non-Ex environments)	0 to 55°C (in non-Ex environments)
Mechanical characteristics	7XV108.50-11	7XV108.50-12	7XV108.50-51	7XV108.50-62
Note	Order 1x 0TB1111.8110 terminal block separately	Order 1x 0TB1111.8110 terminal block separately.	Order male/female M12/M8 connectors separately	Order male/female M12/M8 connectors separately
Module dimensions including mounting plates	63 x 59 x 20 mm (H x W x D)	63 x 59 x 20 mm (H x W x D)	62 x 70 x 30 mm (H x W x D)	67 x 66 x 30 mm (H x W x D)

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

XV116 valve connections

7XV116.50-01, 7XV116.50-11, 7XV116.50-12, 7XV116.50-51, 7XV116.50-62



General information	7XV116.50-01	7XV116.50-11	7XV116.50-12	7XV116.50-51	7XV116.50-62
Power consumption	Max. 0.75 W	Max. 0.75 W	Max. 0.75 W	-	-
Input capacitance					
Module supply	220 µF	47 µF / 7.5 Ω	47 µF / 7.5 Ω	-	-
I/O supply	-	47 µF	47 µF	-	-
Power consumption					
Internal I/O	-	-	-	Max. 1.5 W (without load)	Max. 1.5 W (without load)
X2X Link supply	-	-	-	Max. 0.75 W	Max. 0.75 W
Remote valve terminal connection for 25-pin DSUB multi-pin connection			16 valves		
Certification					
CE			Yes		
cULus			Yes		
ATEX Zone 2 ¹⁾	-	-	-	Yes	Yes
GOST-R			Yes		
Wiring	7XV116.50-01	7XV116.50-11	7XV116.50-12	7XV116.50-51	7XV116.50-62
Bus connection	10-pin	11-pin	11-pin	M12	M12
GND pin	22, 23, 24, 25	22, 23, 24, 25	13, 22, 23, 24, 25	22, 23, 24, 25	13, 22, 23, 24, 25
Power supply	Bus connection	Bus connection	Bus connection	M8	M8
Digital outputs	7XV116.50-01	7XV116.50-11	7XV116.50-12	7XV116.50-51	7XV116.50-62
Switching voltage			24 VDC -25% / +25%		
Total nominal current			1.6 A		
Output circuit			Source		
Output protection			Protected against short circuit, overload and overtemperature		
Type			High-side driver (source)		
Max. output current			0.1 A		
Max. switching frequency			100 Hz		
Operating conditions	7XV116.50-01	7XV116.50-11	7XV116.50-12	7XV116.50-51	7XV116.50-62
EN 60529 protection	IP20	IP20	IP20	IP67	IP67
Environmental conditions	7XV116.50-01	7XV116.50-11	7XV116.50-12	7XV116.50-51	7XV116.50-62
Temperature					
Operation	0 to 55°C	0 to 55°C	0 to 55°C	0 to 55°C (in non-Ex environments)	0 to 55°C (in non-Ex environments)
Mechanical characteristics	7XV116.50-01	7XV116.50-11	7XV116.50-12	7XV116.50-51	7XV116.50-62
Note	Order 1x TB710 terminal block separately	Order 1x 0TB1111.8110 terminal block separately	Order 1x 0TB1111.8110 terminal block separately	Order male/female M12/M8 connectors separately	Order male/female M12/M8 connectors separately
Module dimensions including mounting plates	63 x 59 x 20 mm (H x W x D)	63 x 59 x 20 mm (H x W x D)	63 x 59 x 20 mm (H x W x D)	62 x 70 x 30 mm (H x W x D)	67 x 66 x 30 mm (H x W x D)

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions

XV124 valve connections

7XV124.50-11, 7XV124.50-12, 7XV124.50-51, 7XV124.50-61, 7XV124.50-62



General information	7XV124.50-11	7XV124.50-12	7XV124.50-51	7XV124.50-61	7XV124.50-62
Power consumption	Max. 0.75 W	Max. 0.75 W	-	-	-
Input capacitance					
Module supply	47 µF	47 µF	-	-	-
I/O supply	47 µF	47 µF	-	-	-
Power consumption					
Internal I/O	-	-	Max. 1.5 W (without load)	Max. 1.5 W (without load)	Max. 1.5 W (without load)
X2X Link supply	-	-	Max. 0.75 W	Max. 0.75 W	Max. 0.75 W
Remote valve terminal connection for 25-pin DSUB multi-pin connection			24 valves		
Certification					
CE			Yes		
cULus			Yes		
ATEX Zone 2 ¹⁾	-	-	Yes	Yes	Yes
GOST-R			Yes		
Wiring	7XV124.50-11	7XV124.50-12	7XV124.50-51	7XV124.50-61	7XV124.50-62
Bus connection	11-pin	11-pin	M12	M12	M12
GND pin	25	13	25	25	13
Power supply	Bus connection	Bus connection	M8	M8	M8
Digital outputs	7XV124.50-11	7XV124.50-12	7XV124.50-51	7XV124.50-61	7XV124.50-62
Switching voltage	24 VDC -25% / +25%				
Total nominal current	2.4 A				
Output circuit	Source				
Output protection	Protected against short circuit, overload and overtemperature				
Type	High-side driver (source)				
Max. output current	0.1 A				
Max. switching frequency	100 Hz				
Operating conditions	7XV124.50-11	7XV124.50-12	7XV124.50-51	7XV124.50-61	7XV124.50-62
EN 60529 protection	IP20	IP20	IP67	IP67	IP67
Environmental conditions	7XV124.50-11	7XV124.50-12	7XV124.50-51	7XV124.50-61	7XV124.50-62
Temperature					
Operation	0 to 55°C	0 to 55°C	0 to 55°C (in non-Ex environments)	0 to 55°C (in non-Ex environments)	0 to 55°C (in non-Ex environments)
Mechanical characteristics	7XV124.50-11	7XV124.50-12	7XV124.50-51	7XV124.50-61	7XV124.50-62
Note	Order 1x 0TB1111.8110 terminal block separately	Order 1x 0TB1111.8110 terminal block separately	Order male/female M12/M8 connectors separately	Order male/female M12/M8 connectors separately	Order male/female M12/M8 connectors separately
Module dimensions including mounting plates	63 x 59 x 20 mm (H x W x D)	63 x 59 x 20 mm (H x W x D)	62 x 70 x 30 mm (H x W x D)	67 x 66 x 30 mm (H x W x D)	67 x 66 x 30 mm (H x W x D)

¹⁾ Ta min.: 0°C
Ta max.: See environmental conditions






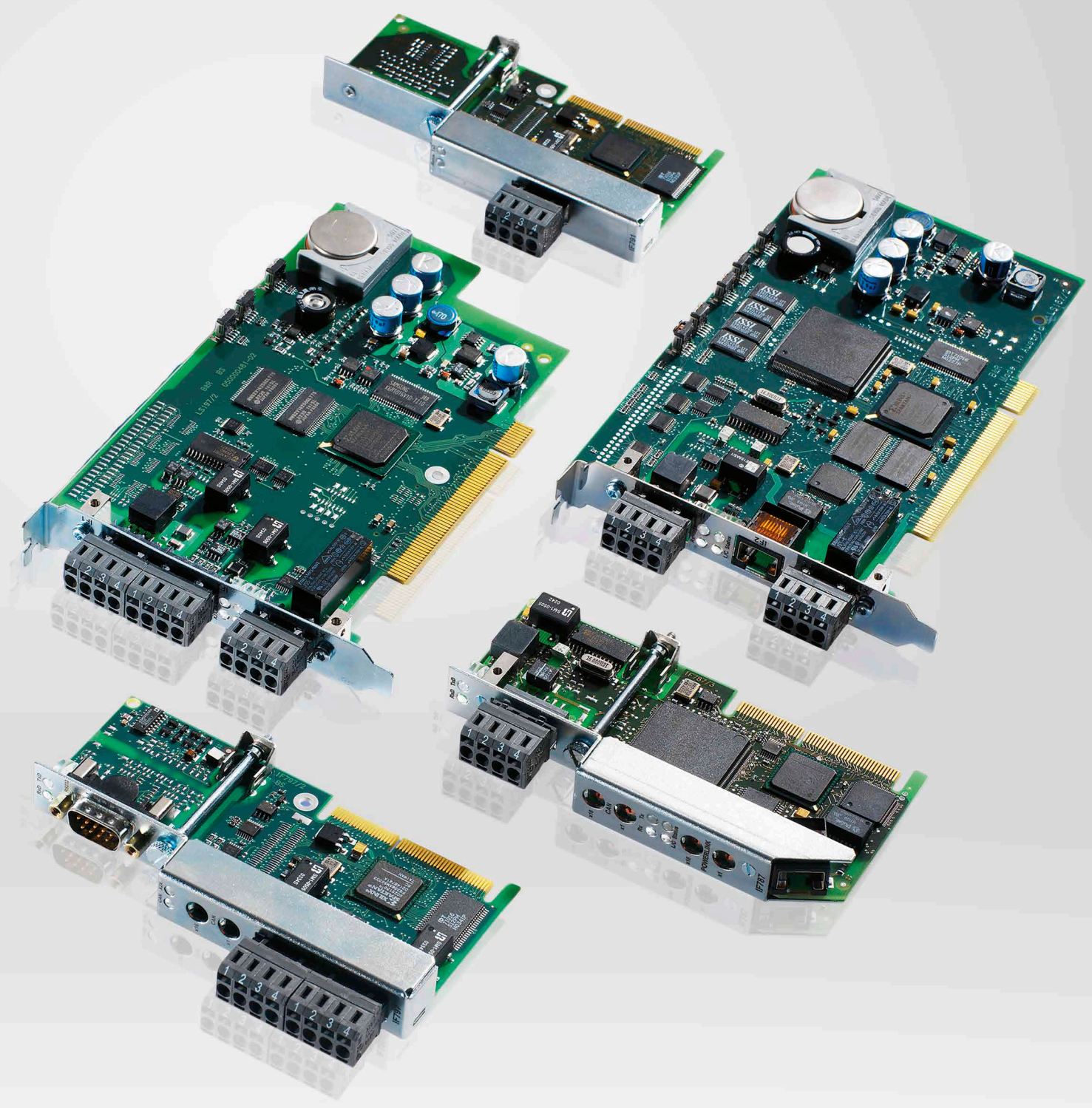
Network and fieldbus modules

Flexible communication

Fieldbus and IT networks are essential in today's automation systems. Solutions from B&R provide support for nearly all industrial fieldbus systems and networks.

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Product overview



aPCI interface modules

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PCI communication modules

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Unlimited communication

Extensive communication options are a standard requirement of nearly every automation solution developed today. Ethernet is experiencing the strongest growth in this sector.

Flexible communication and networking options are a fundamental aspect of all B&R products, with most CPUs equipped with an integrated 10/100 Mbit/s Ethernet interface.

Communication must be adapted to meet the precise requirements of an application, which is why we offer an extensive range of interface modules. These components can be used with all x86-based CPUs from the System 2003 and 2005 series as well as all Power Panel 400 systems. Each of these modules is based on B&R's aPCI standard. For industrial PCs, B&R offers a wide selection of PCI plug-in cards.

aPCI modules (advanced PCI) are based on the standard PCI bus, but their physical properties and boot behavior have been optimized for use in automation systems.

Networks for industrial automation

The demands placed on communication in the field are considerably higher than those of an office environment. The ability to exchange data deterministically and in real time is absolutely crucial. Keeping jitter in the microsecond range and providing extremely high resistance to disturbances are also factors that must always be considered.

Hard real-time for standard Ethernet

As a standardized Fast Ethernet protocol, POWERLINK has proven its tough real-time characteristics in thousands of applications. With the openness and continuous advancement of this technology guaranteed by the Ethernet POWERLINK Standardization Group, or EPSG, the POWERLINK system represents the second generation of fieldbuses and makes it possible to apply the full power of IT technologies to the field of industrial automation for the first time. POWERLINK is equally suited for drives, I/O, visualization and data exchange between PLC systems.

CAN bus in automation

CAN bus has also enjoyed much success of late, particularly in machine manufacturing, and continues to gain in popularity. High resistance to disturbances, high-speed data transfer, ease of use and deterministic real-time behavior are some of the reasons for this success. CAN is the ideal fieldbus for applications with a manageable number of remote I/O nodes and few axes. Nevertheless, CAN bus reaches its limits when it comes to larger and more complex machines. It is in these applications where the higher performance of POWERLINK is required.

Decentralized backplane

Decentralization is a dominating trend in the automation industry. This is mainly due to cost considerations as there are clear advantages of a decentralized structure for many different types of applications. These demands led to the idea of handling the conventional backplane for I/O modules used with a PLC system or bus controller in a single cable. The result is an extremely high-speed I/O connection made via X2X Link.

Serial communication

Interfaces such as RS232, RS422 and RS485 continue to play an important role in the world of automation. Robust, simple yet extremely efficient, these interfaces still find usage in a wide range of areas. The classic RS232 interface is fully capable of meeting the demands of system programming and maintenance.

ETHERNET

POWERLINK: Real-time Ethernet is reality

Why Ethernet?

In order to simplify development, maintenance and the supply chain, the standardization of nearly every level of data communication and network technology is essential. With the Internet revolution, widely adopted networking and protocol standards from the IT world have reached cost and effectiveness levels that make them attractive for use in industrial automation as well.

- **The future of Ethernet is guaranteed** - The base technology has existed for over 30 years and continues to be developed. The long life cycles characteristic of the automation industry demand this type of lasting base.
- **Ethernet technology is familiar** - Ethernet and its associated protocols are considered common knowledge nowadays. A large number of available tools, programs and components continues to reduce costs.
- **Ethernet provides transparency** - Ethernet standards bring together IP-based data transfer protocols used for many different purposes. The integration of IT and automation by using Ethernet provides real interoperability with Internet flexibility anywhere in the world.
- **Ethernet is real-time capable** - POWERLINK brings Ethernet to the sensor and actuator level, with cycle times down to 200 μ s and ultra-precise timing precision of less than one microsecond.

aPCI communication modules

3IF722.9, 3IF771.9, 3IF772.9



Short description	3IF722.9	3IF771.9	3IF772.9
Communication module	1x RS485/RS422, 1x CAN bus, 1x RS485	1x CAN bus	1x RS232, 2x CAN bus
General information	3IF722.9	3IF771.9	3IF772.9
Power consumption			
3.3 VDC	0.74 W	0.64 W	0.2 W
5 VDC	1.0 W	0.66 W	1.8 W
Total	1.74 W	1.3 W	2.0 W
Certification			
CE		Yes	
cULus		Yes	
GOST-R		Yes	
Interfaces	3IF722.9	3IF771.9	3IF772.9
IF1 interface			
Signal	RS485/RS422	CAN bus ¹⁾	RS232
Design	9-pin female DSUB connector	4-pin male multipoint connector	9-pin male DSUB connector
Max. distance	1200 m	1000 m	900 m
Transfer rate	Max. 115.2 kbit/s	Max. 500 kbit/s	Max. 115.2 kbit/s
IF2 interface			
Signal	CAN bus ¹⁾	-	CAN bus ¹⁾
Design	4-pin male multipoint connector	-	4-pin male multipoint connector
Max. distance	1000 m	-	1000 m
Transfer rate	Max. 500 kbit/s	-	Max. 500 kbit/s
IF3 interface			
Signal	RS485	-	CAN bus ¹⁾
Design	4-pin male multipoint connector	-	4-pin male multipoint connector
Max. distance	1200 m	-	1000 m
Transfer rate	Max. 115.2 kbit/s	-	Max. 500 kbit/s
Environmental conditions	3IF722.9	3IF771.9	3IF772.9
Temperature			
Operation		0 to 60°C	
Mechanical characteristics	3IF722.9	3IF771.9	3IF772.9
Note	Order 2x 0TB704.9 terminal blocks separately	Order 1x TB704 terminal block separately	Order 2x 0TB704.9 terminal blocks separately
Slot		Insert e.g. in CP360	

¹⁾ This CAN bus interface can be configured as a CANopen master in Automation Studio 3.0 and higher.

aPCI communication modules

3IF761.9, 3IF762.9, 3IF766.9, 3IF7E3.9, 3IF781.9



Short description	3IF761.9	3IF762.9	3IF766.9	3IF7E3.9	3IF781.9
Communication module	1x RS232, 1x PROFIBUS DP V0 slave	1x RS485/RS422, 1x PROFIBUS DP V0 slave	1x RS232, 1x PROFIBUS DP V0/V1 master	PROFINET RT device (slave)	1x Ethernet
General information	3IF761.9	3IF762.9	3IF766.9	3IF7E3.9	3IF781.9
Power consumption					
3.3 VDC	0.15 W	0.15 W	0.8 W	1.6 W	0.66 W
5 VDC	1.2 W	1.29 W	0.5 W	-	-
Total	1.35 W	1.44 W	1.3 W	1.6 W	0.66 W
Certification					
CE			Yes		
cULus			Yes		
GOST-R			Yes		
Interfaces	3IF761.9	3IF762.9	3IF766.9	3IF7E3.9	3IF781.9
Fieldbus	-	-	-	PROFINET RT device (slave)	-
Signal	-	-	-	-	Ethernet
Design	-	-	-	1x shielded RJ45 port	1x shielded RJ45 port
Cable length	-	-	-	Max. 100 m between two stations (segment length)	Max. 100 m between two stations (segment length)
Transfer rate	-	-	-	100 Mbit/s	10/100 Mbit/s
Transmission					
Physical layer	-	-	-	100BASE-TX	10BASE-T/100BASE-TX
Half-duplex	-	-	-	Yes	Yes
Full-duplex	-	-	-	Yes	Yes
Autonegotiation	-	-	-	Yes	Yes
Auto-MDI / MDIX	-	-	-	Yes	No
IF1 interface					
Signal	RS232	RS485/RS422	RS232	-	-
Design	9-pin male DSUB connector	9-pin female DSUB connector	9-pin male DSUB connector	-	-
Max. distance	900 m	1200 m	900 m	-	-
Transfer rate	Max. 115.2 kbit/s	Max. 115.2 kbit/s	Max. 115.2 kbit/s	-	-
IF2 interface					
Fieldbus	PROFIBUS DP V0 slave	PROFIBUS DP V0 slave	PROFIBUS DP V0/V1 master ¹⁾	-	-
Design	9-pin female DSUB connector	9-pin female DSUB connector	9-pin female DSUB connector	-	-
Number of slaves	-	-	125	-	-
Max. distance	1200 m	1200 m	1200 m	-	-
Transfer rate	Max. 12 Mbit/s	Max. 12 Mbit/s	Max. 12 Mbit/s	-	-
Environmental conditions	3IF761.9	3IF762.9	3IF766.9	3IF7E3.9	3IF781.9
Temperature					
Operation			0 to 60°C		
Mechanical characteristics	3IF761.9	3IF762.9	3IF766.9	3IF7E3.9	3IF781.9
Slot			Insert e.g. in CP360		

¹⁾ This fieldbus can be configured with the configuration tool included in Automation Studio 3.0 and higher. In older versions of Automation Studio, the B&R fieldbus configuration tool must be ordered separately.

3IF782.9-1, 3IF786.9-1, 3IF787.9-1, 3IF789.9-1



Short description	3IF782.9-1	3IF786.9-1	3IF787.9-1	3IF789.9-1
Communication module	1x RS485, 1x POWERLINK (V1/V2) managing or controlled node	1x RS232, 1x POWERLINK (V1/V2) managing or controlled node	1x CAN bus, 1x POWERLINK (V1/V2) managing or controlled node	1x X2X Link master, 1x POWERLINK (V1/V2) managing or controlled node
General information	3IF782.9-1	3IF786.9-1	3IF787.9-1	3IF789.9-1
Power consumption				
3.3 VDC	2.5 W	2.0 W	2.5 W	2.3 W
5 VDC	0.3 W	0.5 W	0.5 W	0.5 W
Total	2.8 W	2.5 W	3.0 W	2.8 W
Certification				
CE			Yes	
cULus			Yes	
GOST-R			Yes	
Interfaces	3IF782.9-1	3IF786.9-1	3IF787.9-1	3IF789.9-1
IF1 interface				
Fieldbus	-	-	-	X2X Link master
Signal	RS485	RS232	CAN bus ¹⁾	-
Design	4-pin male multipoint connector	9-pin male DSUB connector	4-pin male multipoint connector	4-pin male multipoint connector
Distance between 2 stations	-	-	-	Max. 100 m
Max. distance	1200 m	900 m	1000 m	-
Transfer rate	Max. 115.2 kbit/s	Max. 115.2 kbit/s	Max. 500 kbit/s	-
IF2 interface				
Fieldbus				POWERLINK (V1/V2) managing or controlled node
Type	Type 3 ²⁾	Type 3 ²⁾	Type 3 ²⁾	Type 2 ²⁾
Design				1x shielded RJ45 port
Cable length				Max. 100 m between two stations (segment length)
Transfer rate				100 Mbit/s
Transmission				
Physical layer				100BASE-TX
Half-duplex				Yes
Full-duplex				No
Autonegotiation				Yes
Auto-MDI / MDIX				Yes
Environmental conditions	3IF782.9-1	3IF786.9-1	3IF787.9-1	3IF789.9-1
Temperature				
Operation			0 to 60°C	
Mechanical characteristics	3IF782.9-1	3IF786.9-1	3IF787.9-1	3IF789.9-1
Note	Order 1x TB704 terminal block separately	-	Order 1x TB704 terminal block separately	Order 1x TB704 terminal block separately
Slot			Insert e.g. in CP360	

¹⁾ This CAN bus interface can be configured as a CANopen master in Automation Studio 3.0 and higher.

²⁾ See the POWERLINK section of the AS help system under „Communication, POWERLINK, General information, Hardware - IF/LS“.

aPCI communication modules

3IF779.9, 3IF791.9, 3IF792.9, 3IF797.9-1



Short description	3IF779.9	3IF791.9	3IF792.9	3IF797.9-1
Communication module	1x RS485/RS422, 1x CAN bus, 1x X2X Link master	1x X2X Link master	1x RS232, 2x X2X Link master	1x RS232, 1x CAN bus, 1x X2X Link master
General information	3IF779.9	3IF791.9	3IF792.9	3IF797.9-1
Power consumption				
3.3 VDC	0.77 W	0.43 W	0.5 W	0.68 W
5 VDC	1.74 W	0.76 W	1.35 W	1.28 W
Total	2.51 W	1.19 W	1.85 W	1.96 W
Certification				
CE			Yes	
cULus			Yes	
GOST-R			Yes	
Interfaces	3IF779.9	3IF791.9	3IF792.9	3IF797.9-1
IF1 interface				
Fieldbus	-	X2X Link master	-	-
Signal	RS485/RS422	-	RS232	RS232
Design	9-pin female DSUB connector	4-pin male multipoint connector	9-pin male DSUB connector	9-pin male DSUB connector
Distance between 2 stations	-	Max. 100 m	-	-
Max. distance	1200 m	-	900 m	900 m
Transfer rate	Max. 115.2 kbit/s	-	Max. 115.2 kbit/s	Max. 115.2 kbit/s
IF2 interface				
Fieldbus	-	-	X2X Link master	-
Signal	CAN bus ¹⁾	-	-	CAN bus ¹⁾
Design	4-pin male multipoint connector	-	4-pin male multipoint connector	4-pin male multipoint connector
Distance between 2 stations	-	-	Max. 100 m	-
Max. distance	1000 m	-	-	1000 m
Transfer rate	Max. 500 kbit/s	-	-	Max. 500 kbit/s
IF3 interface				
Fieldbus	X2X Link master	-	X2X Link master	X2X Link master
Design	4-pin male multipoint connector	-	4-pin male multipoint connector	4-pin male multipoint connector
Distance between 2 stations	Max. 100 m	-	Max. 100 m	Max. 100 m
Environmental conditions	3IF779.9	3IF791.9	3IF792.9	3IF797.9-1
Temperature				
Operation			0 to 60°C	
Mechanical characteristics	3IF779.9	3IF791.9	3IF792.9	3IF797.9-1
Note	Order 2x 0TB704.9 terminal blocks separately	Order 1x TB704 terminal block separately	Order 2x 0TB704.9 terminal blocks separately	Order 2x 0TB704.9 terminal blocks separately Replaces interface module 3IF797.9 starting with AS 2.4
Slot	Insert e.g. in CP360			

¹⁾ This CAN bus interface can be configured as a CANopen master in Automation Studio 3.0 and higher.

Logic scanners

5LS166.6, 5LS172.6, 5LS197.6



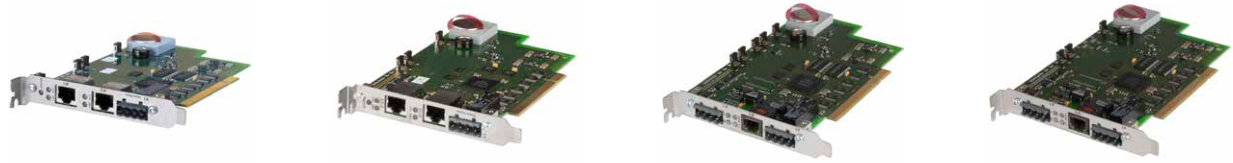
Short description	5LS166.6	5LS172.6	5LS197.6
Communication module	1x RS232, 1x PROFIBUS DP V0/V1 master	2x CAN bus	1x CAN bus, 1x X2X Link master
General information	5LS166.6	5LS172.6	5LS197.6
Ready relay	No	Normally open and normally closed contact, max. 30 VDC, max. 6 A	Normally open and normally closed contact, max. 30 VDC, max. 6 A
Power consumption	1.5 W	2.4 W	2.28 W
Certification			
CE		Yes	
cULus		Yes	
GOST-R		Yes	
Controller	5LS166.6	5LS172.6	5LS197.6
SRAM	1 MB, battery-backed	256 kB, battery-backed	1 MB, battery-backed
Interfaces	5LS166.6	5LS172.6	5LS197.6
IF1 interface			
Signal	RS232	CAN bus ¹⁾	CAN bus ¹⁾
Design	9-pin male DSUB connector	4-pin male multipoint connector	4-pin male multipoint connector
Max. distance	900 m	1000 m	1000 m
Transfer rate	Max. 115.2 kbit/s	Max. 500 kbit/s	Max. 500 kbit/s
IF2 interface			
Fieldbus	PROFIBUS DP V0/V1 master ²⁾	-	X2X Link master
Signal	-	CAN bus ¹⁾	-
Design	9-pin female DSUB connector	4-pin male multipoint connector	4-pin male multipoint connector
Number of slaves	125	-	-
Distance between 2 stations	-	-	Max. 100 m
Max. distance	1200 m	1000 m	-
Transfer rate	Max. 12 Mbit/s	Max. 500 kbit/s	-
Environmental conditions	5LS166.6	5LS172.6	5LS197.6
Temperature			
Operation	0 to 55°C	0 to 55°C	0 to 60°C
Mechanical characteristics	5LS166.6	5LS172.6	5LS197.6
Note	-	3x 0TB704.9 terminal blocks included in delivery Lithium battery included in delivery	Order 3x 0TB704.9 terminal blocks separately Lithium battery included in delivery
Slot		Standard PCI half-size module, Plug & Play	
Installation in			
B&R Automation PC		Yes	
B&R Panel PC		Yes	
Desktop PC		Yes	

¹⁾ This CAN bus interface can be configured as a CANopen master in Automation Studio 3.0 and higher.

²⁾ This fieldbus can be configured with the configuration tool included in Automation Studio 3.0 and higher. In older versions of Automation Studio, the B&R fieldbus configuration tool must be ordered separately.

Logic scanners

5LS182.6-1, 5LS182.6-2, 5LS187.6-1, 5LS189.6-1



Short description	5LS182.6-1	5LS182.6-2	5LS187.6-1	5LS189.6-1
Communication module	1x POWERLINK (V1/V2) managing or controlled node	1x POWERLINK (V1/V2) managing or controlled node	1x CAN bus, 1x POWERLINK (V1/V2) managing or controlled node	1x X2X Link master, 1x POWERLINK (V1/V2) managing or controlled node
General information	5LS182.6-1	5LS182.6-2	5LS187.6-1	5LS189.6-1
Ready relay	Normally open and normally closed contact, max. 30 VDC, max. 6 A	Normally open and normally closed contact, max. 30 VDC, max. 10 A	Normally open and normally closed contact, max. 30 VDC, max. 6 A	Normally open and normally closed contact, max. 30 VDC, max. 6 A
Power consumption	2 W	2 W	4.0 W	4.0 W
Certification				
CE			Yes	
cULus			Yes	
GOST-R	In preparation	Yes	Yes	Yes
Controller	5LS182.6-1	5LS182.6-2	5LS187.6-1	5LS189.6-1
SRAM			1 MB, battery-backed	
Interfaces	5LS182.6-1	5LS182.6-2	5LS187.6-1	5LS189.6-1
Fieldbus	POWERLINK (V1/V2) managing or controlled node	POWERLINK (V1/V2) managing or controlled node	-	-
Type	Type 3 ¹⁾	Type 4 ¹⁾	-	-
Design	2x shielded RJ45 (hub)	2x shielded RJ45 (hub)	-	-
Cable length	Max. 100 m between 2 nodes (segment length)	Max. 100 m between 2 nodes (segment length)	-	-
Transfer rate	100 Mbit/s	100 Mbit/s	-	-
Transmission				
Physical layer	100BASE-TX	100BASE-TX	-	-
Half-duplex	Yes	Yes	-	-
Full-duplex	No	No	-	-
Autonegotiation	Yes	Yes	-	-
Auto-MDI / MDIX	Yes	Yes	-	-
Hub runtime	0.96 to 1 μs	0.96 to 1 μs	-	-
IF1 interface				
Fieldbus	-	-	-	X2X Link master
Signal	-	-	CAN bus ²⁾	-
Design	-	-	4-pin male multipoint connector	4-pin male multipoint connector
Distance between 2 stations	-	-	-	Max. 100 m
Max. distance	-	-	1000 m	-
Transfer rate	-	-	Max. 1 Mbit/s	-
IF2 interface				
Fieldbus	-	-	POWERLINK (V1/V2) managing or controlled node	POWERLINK (V1/V2) managing or controlled node
Type	-	-	Type 3 ¹⁾	Type 3 ¹⁾
Design	-	-	1x shielded RJ45 port	1x shielded RJ45 port
Cable length	-	-	Max. 100 m between two stations (segment length)	Max. 100 m between two stations (segment length)
Transfer rate	-	-	100 Mbit/s	100 Mbit/s

5LS182.6-1, 5LS182.6-2, 5LS187.6-1, 5LS189.6-1

Transmission				
Physical layer	-	-	100BASE-TX	100BASE-TX
Half-duplex	-	-	Yes	Yes
Full-duplex	-	-	No	No
Autonegotiation	-	-	Yes	Yes
Auto-MDI / MDIX	-	-	Yes	Yes
Environmental conditions	5LS182.6-1	5LS182.6-2	5LS187.6-1	5LS189.6-1
Temperature				
Operation			0 to 55°C	
Mechanical characteristics	5LS182.6-1	5LS182.6-2	5LS187.6-1	5LS189.6-1
Note	Order 1x TB704 terminal block separately Lithium battery is included in the delivery	Order 1x TB704 terminal block separately Lithium battery is included in the delivery	Order 2x TB704 terminal blocks separately Lithium battery included in delivery	Order 2x TB704 terminal blocks separately Lithium battery included in delivery
Slot	Standard PCI half-size module, Plug & Play			
Installation in				
B&R Automation PC			Yes	
B&R Panel PC			Yes	
Desktop PC			Yes	

¹⁾ See the POWERLINK section of the AS help system under „Communication, POWERLINK, General information, Hardware - IF/LS“.

²⁾ This CAN bus interface can be configured as a CANopen master in Automation Studio 3.0 and higher.

PCI communication modules

PCI communication modules



Model number	Short description
5ACPCI.XCOM-00	PCI CANopen fieldbus card - 1 CANopen master
5ACPCI.XCOS-00	PCI CANopen fieldbus card - 1 CANopen slave
5ACPCI.XDNM-00	PCI DeviceNet fieldbus card - 1 DeviceNet master
5ACPCI.XDNS-00	PCI DeviceNet fieldbus card - 1 DeviceNet slave
5ACPCI.XDPM-00	PCI PROFIBUS fieldbus card - 1 PROFIBUS DP master
5ACPCI.XDPS-00	PCI PROFIBUS fieldbus card - 1 PROFIBUS DP slave
5ACPCI.XPNM-00	PCI PROFINET controller fieldbus card - 2 RJ45
5ACPCI.XPNS-00	PCI PROFINET device fieldbus card - 2 RJ45



open 
SAFETY

ETHERNET 
POWERLINK





Open automation technology

Maximum performance and absolute openness

Maximum performance and absolute openness make up the core expectations that manufacturers and users of automation products want to see from industrial communication solutions.

With POWERLINK and the fieldbus-independent openSAFETY protocol, not only have Open Automation Technologies from B&R produced the only pure software solution on the market for strict real-time requirements – they have also become leading international standards. The result is the guaranteed security of your investment.

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POWERLINK Slave Development Kit

Development kit

The POWERLINK Slave Development Kit is a comprehensive solution for integrating POWERLINK into a wide variety of automation products. It combines all of the necessary components such as design data, software, documentation and training so that a POWERLINK connection can be fully implemented in the shortest possible time.

The perfect solution for meeting any requirement

When it comes to fieldbus connections, today's systems demand maximum power in the smallest size possible. Meeting individual demands requires the highest degree of flexibility while still keeping unit costs as low as possible. The open FPGA technology that powers the POWERLINK Slave Development Kit was specifically designed to meet these demands. With variants for Altera and Xilinx products, both FPGA market leaders are covered.

Added value for every component

The POWERLINK Slave Development Kit is the perfect complement for all automation components:

- Drives
- I/O and image recognition systems
- Standard and safety sensors
- Valve components
- Gateways

Training and support

In order to make the introduction to POWERLINK technology as efficient as possible, the kit includes an invitation to a training seminar alongside the user documentation. The "Implementation Workshop" provides an opportunity to learn about the basics of POWERLINK as well as concepts for easily integrating this technology into many types of products.

Topics covered by this training include:

- The basics of POWERLINK
- Configuring and integrating a POWERLINK slave
- Creating a suitable device description file (XDD)
- Testing the configured device on a POWERLINK network

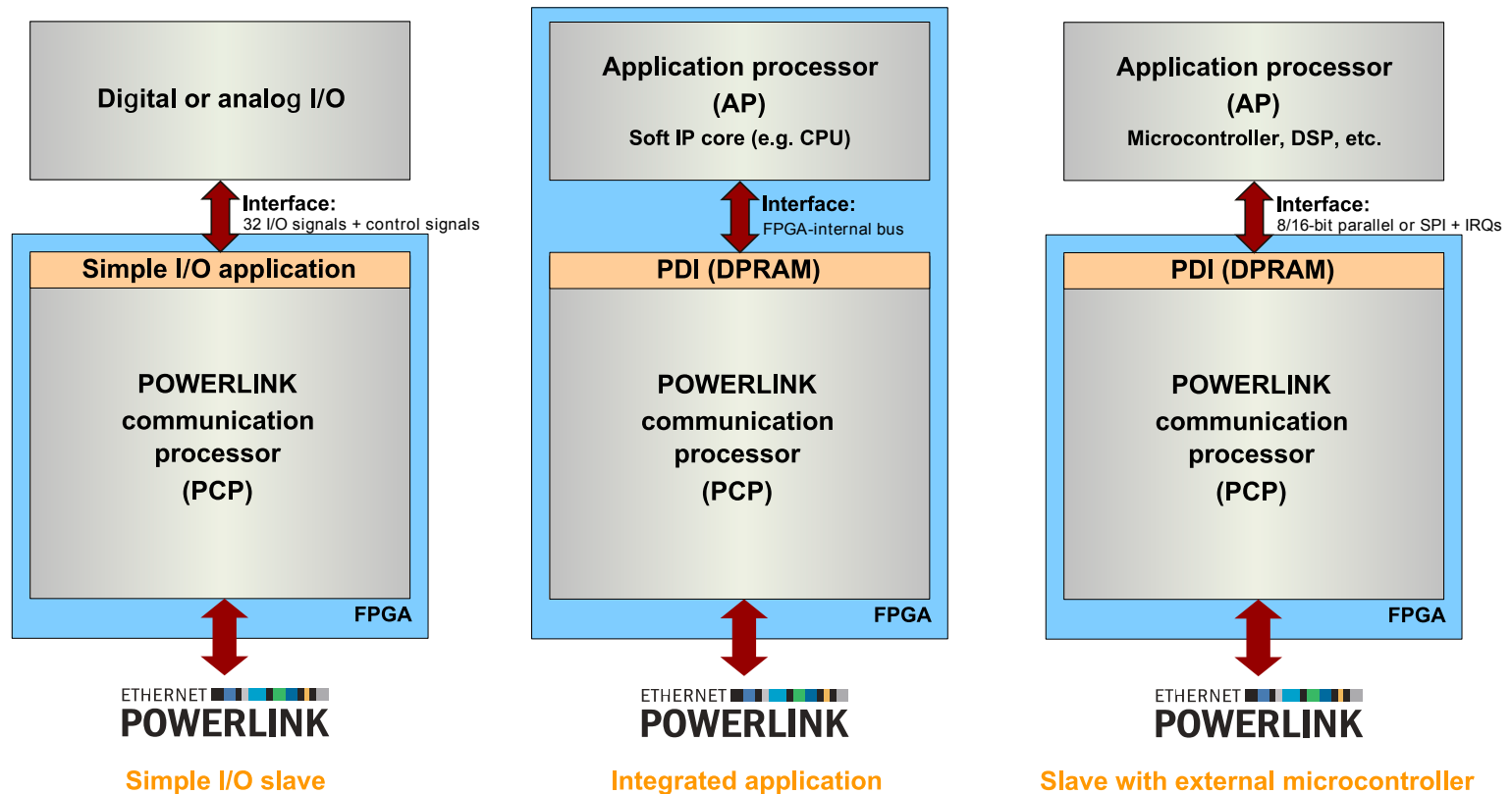
In addition, comprehensive business-level support guarantees professional care and consultation during the product's entire life cycle.

Test system

The POWERLINK Slave Development Kit is complemented by a complete test system that can be used to easily set up a POWERLINK network. Delivery includes both a POWERLINK master in the form of an X20 CPU (along with Automation Studio) as well as an X20 I/O system as a reference system.

The test system is also available as a single product under the name "POWERLINK Master Evaluation Bundle".

Three different options are available for the POWERLINK slave in order to achieve the optimal solution for each respective product:





Technical data	Altera POWERLINK slave	Xilinx POWERLINK slave
Device	Altera® Cyclone IV EP4CE6	Xilinx® Spartan-6 XC6LX9
Reference platform	Terasic® Industrial Networking Kit (INK)	Avnet® Xilinx Spartan-6 LX16 FPGA POWERLINK Kit
Speed		100 Mbit/s
Max. frame size		1518 bytes
Physical interface		Standard Ethernet (IEEE 802.3)
Number of Ethernet ports		Up to 8
External interfaces		32 direct I/O lines, SPI, 8/16-bit parallel
Topology		Star, ring, line
TCP/IP support		Yes
Synchronization / Real-time capability		±100 ns
Supported standards		POWERLINK specification EPSG DS301
Software license		BSD
Model number	OAT110130:10-1	OAT110130:11-1

One safety standard for the entire machine line

As the world's only open source safety protocol, openSAFETY provides a uniform safety standard for a single machine or entire machine line, regardless of the controller manufacturer and fieldbus standard being used. This enables the bus-independent openSAFETY standard to reduce costs and startup times for entire production plants while allowing increases in productivity that are just not possible with other safety protocols.

Advantages for machine builders

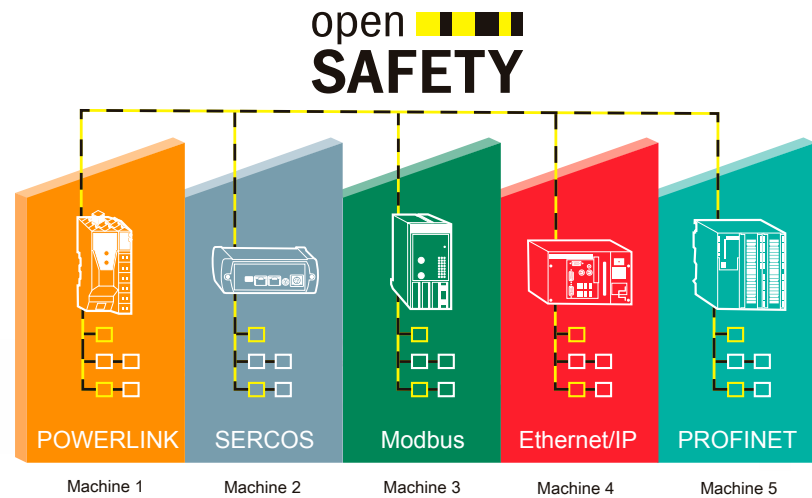
- Perfect for safe modular machine concepts
- Open selection of safety sensor technology
- Faster response times
- Reduced safety clearances
- Increased productivity
- Simplified implementation of machine guidelines
- Series availability of SafeMOTION functions

Advantages for plant operators

- One comprehensive safety standard for the entire plant
- For all controller manufacturers
- Minimal commissioning and retooling times
- Security of investment / Legal and technical independence
- Maximum productivity through direct communication

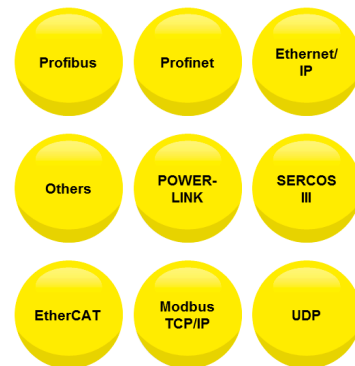
Advantages for sensor manufacturers

- Safety development only necessary once
- No investment risk
- Minimum time to market with precertification
- Lower costs through open source
- Guaranteed interoperability
- No risk for redesigns



open SAFETY

**Covers 100%
of the market**



openSAFETY slave

The openSAFETY slave (safe node, or SN) makes it possible to safely exchange data over any transport protocol while satisfying IEC 61508 SIL 3 requirements. At the same time, the producer/consumer principle allows direct communication between any number of openSAFETY slave systems. The safe node was developed for the smallest demands on the microcontroller (e.g. ARM7) and is usually implemented in safe I/O modules, light barriers or safety-oriented drives.

openSAFETY master

The openSAFETY master is responsible for organizing and monitoring a safety network while making sure that parameters are routed to where they need to go. An openSAFETY master is typically implemented on a safety controller or other safety-oriented programmable system. The openSAFETY master is a pure software solution and can therefore be used freely on any hardware platform.

Technical data

Platform	Any microcontroller
Max. payload	254 bytes of safety data
IEC standard	IEC 61784-3 FCP 13
Safety level	IEC 61508 SIL 3 certified
TÜV certification	TÜV Rheinland and TÜV Süd
Physical interfaces	Ethernet-based fieldbus systems, Ethernet, CAN
Communication model	Producer/Consumer
Supported configuration master	All openSAFETY SCMs
Parameter configuration	Automatic
Available manufacturer parameters	Freely configurable
Model number	OAT211110

openSAFETY slave

Platform	Any microcontroller
Max. payload	254 bytes of safety data
IEC standard	IEC 61784-3 FCP 13
Safety level	IEC 61508 SIL 3 certified
TÜV certification	TÜV Rheinland and TÜV Süd
Physical interfaces	Ethernet-based fieldbus systems, Ethernet, CAN
Communication model	Producer/Consumer
Supported configuration master	All openSAFETY SCMs
Parameter configuration	Automatic
Available manufacturer parameters	Freely configurable
Model number	OAT211110

Technical data

Platform	Any microcontroller
Max. payload	254 bytes of safety data per slave
IEC standard	IEC 61784-3 FCP 13
Safety level	IEC 61508 SIL 3 certified
TÜV certification	TÜV Rheinland and TÜV Süd
Physical interfaces	Ethernet-based fieldbus systems, Ethernet, CAN
Communication model	Producer/Consumer
Max. number of openSAFETY stations	1023 safety domains x 1023 stations per domain
Parameter configuration	Automatic
Model number	OAT211210

openSAFETY master

Platform	Any microcontroller
Max. payload	254 bytes of safety data per slave
IEC standard	IEC 61784-3 FCP 13
Safety level	IEC 61508 SIL 3 certified
TÜV certification	TÜV Rheinland and TÜV Süd
Physical interfaces	Ethernet-based fieldbus systems, Ethernet, CAN
Communication model	Producer/Consumer
Max. number of openSAFETY stations	1023 safety domains x 1023 stations per domain
Parameter configuration	Automatic
Model number	OAT211210



ZERTIFIKAT
CERTIFICATE

EG-Baumusterprüfbescheinigung
Registrar-Nr.: 01/205/0726/10

Prüfgegenstand Product tested	Sicherheitsgerichtetes Antriebssystem AC/DC-Optimal mit integrierter Sicherheitsfunktionem SafeMC	Zertifizierungsstelle Certification body	Bernecker + Rainer Industrie-Elektronik GmbH B&R Straße 1 5142 Egelberg Austria
Typbezeichnung Type designation	Siehe Modultyp SJM_SafeMC_Modultyp_D_xx	Hersteller Manufacturer	siehe Zertifizierungsstelle
Prüfstandards Codes and standards	EN 61508-2:2007 EN 61508-3:2004 EN ISO 13849-1:2006 EN 60204-1:2005 IEC 61508-1:1998-2000 EN 60278:1997 EN 60204-1:2005 EN 1021745:2008 EN 61131-2:2007 (einzelnweise)		
Bestimmungszweck Intended application	Das sichere Antriebssystem ist geeignet für den Einsatz in sicherheitsgerichteten Anwendungen bis Kat. 4 / PL e nach EN ISO 13849-1 und bis SIL 3 nach EN 60204-1/IEC 61508 in Abhängigkeit von der verwendeten Sicherheitsfunktion. Safe Torque Off, STO Safe Brake Control, SBC Safe Operating Stop, SOPS Safe Stop 2, SS2 Safe Stop 2, SSS Safe Limited Speed, SLS Safe Maximum Speed, SMS Safe Direction, SD Safety Limited Increments, SLI		bis SIL 3, PL e, Kat. 4 bis SIL 3, PL e, Kat. 4 bis SIL 2, PL e, Kat. 3 bis SIL 3, PL e, Kat. 4 bis SIL 2, PL e, Kat. 3 bis SIL 2, PL e, Kat. 3 bis SIL 2, PL e, Kat. 3 bis SIL 2, PL e, Kat. 3 bis SIL 2, PL e, Kat. 3 bis SIL 2, PL e, Kat. 3
Bestimmte Bedingungen Specific requirements	Beim Einsatz des Systems sind die Hinweise im Anwenhandbuch und die offizielle Liste mit den gültigen Modul-Versionen von Hand- und Firmware zu beachten (siehe Modultyp).		
Es wird bestätigt, dass das Produkt mit den Anforderungen nach Anhang I der Richtlinie 2006/42/EG über Maschinen übereinstimmt. Dieses Zertifikat ist gültig bis 18.02.2015.			



Functional Safety
Type Approved

Der Prüfbericht-Nr.: 9069EZ 428.0010 vom 18.02.2010 ist Bestandteil dieses Zertifikates.
Der Inhaber dieses für den Prüfgegenstand gültigen Genehmigungs-Ausweises ist berechtigt, die mit dem Prüfgegenstand übereinstimmenden Erzeugnisse mit dem abgebildeten Prüfzeichen zu versehen.
The test report-no.: 9069EZ 428.0010 dated 2010-02-18 is an integral part of the certificate.
The holder of a valid licence certificate for the product tested is authorized to affix the test mark (shown opposite to products, which are identical with the product tested).



Berlin, 18.02.2010



CERTIFICATE
No. Z10 10 02 41745 001

Holder of Certificate: Bernecker + Rainer
Industrie-Elektronik Ges.m.b.H.
S&S Omasse 1
5142 Egelberg
AUSTRIA

Factory(ies): 41745

Certification Mark: 

Product: Safety related automation systems

Model(s): openSAFETY Protocolstack

Parameters: Specification: EPSG WDP 304 V1-1-2
Protocol software: 1.1.2.0

Tested according to: IEC 61508-1:1998 (SIL 3)
IEC 61508-2:2003 (SIL 3)
IEC 61508-3:1998 (SIL 3)
IEC 1508-4:1998 (SIL 3)
IEC 61784-3:2008

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition the certification holder must not transfer the certificate to third parties. See also notes overleaf.

Test report no.: BE55023T

Date: 2010-03-02  (Gunter Gießl)

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


TÜV SÜD Product Service GmbH · Zertifizierungsstelle · Riederstrasse 65 · 83309 München · Germany 

Power supplies

Switched-mode power supplies and accessories

Additional power supply components offered by B&R fit perfectly into the implementation of complete system solutions.

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Product overview



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Three-phase power supplies

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Buffer module

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Uninterruptible power supply

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Power supplies on the mounting rail

In order to satisfy demands for complete, comprehensive system solutions, we offer a wide range of power supplies for top-hat rail installation. This extensive spectrum ranges from single-phase power supplies that supply 2 A up to three-phase power supplies that supply 40 A. All of these switched-mode power supplies can handle a wide range of AC and DC input voltages, including input ranges from 100 to 240 VAC or 400 to 500 VAC and from 90 to 350 VDC. In addition to a wide range of voltage inputs, these devices are also certified for a wide temperature range spanning from -25°C to +70°C. In addition to being no-load proof, all power supplies also provide short circuit and overload protection.

The lower power range up to 100 W contains four extremely compact power supplies (the PS1020, PS1025, PS1040 and PS1042) in a robust plastic housing. The functional DIN rail allows fast mounting and removal. The compact design and easy mounting make the four smallest power supplies in this product line components that can be in the most compact control cabinets.

All other power supplies from the PS1050 on up feature a metal housing with a ventilation grill that protects the internal electronics from small parts such as screws. A sophisticated mounting system enables quick and easy installation on the mounting rail: simply snap it into place and that's it. Even the 40 A device rests as though it were screwed in tightly.

Optimal layout of connection and control elements

Connection terminals and control elements are clearly arranged and labeled on the front of the device. And since the terminals are located at the top or bottom of these devices, they are extremely easy to access. Not only does their size and stability allow for the use of a power screwdriver, terminals are also designed in such a way that cables can get by without heat protection, even with larger devices. These units also come equipped with a third minus terminal for easily implementing secondary grounding, further reducing installation costs.

Safety is key

Electronic current limiting protects electrical installations from overload and short circuits. **Overvoltage protection** protects connected consumers in the event that the controlled system fails. And **over-temperature protection** initiates a continuous reduction of output power when the temperature gets too high until it has once again returned to the permissible range (thermal load distribution).

Overload behavior

To prevent devices from immediately cutting off when a minimal overload occurs, these power supplies operate according to an I-V curve with a variable operating point:

- **Output characteristics:** The I-V curve ensures that highly capacitive loads as well as consumers with DC-to-DC converters in the input circuit are reliably supplied.
- **Overload design:** Output current is limited if a short circuit or overload occurs. Instead of cutting off, the unit delivers a continuous output current. The secondary voltage is also lowered until the secondary short circuit or overload has been corrected. Downstream fuses are tripped reliably, and identical power supplies can be connected in parallel without any problems during startup.

Electromagnetic compatibility (EMC)

All devices satisfy EN 61000-6-3 (emissions) and EN 61000-6-2 (immunity to disturbances) standards in the highest respective class. Noise suppression is also provided on the output to prevent even long unshielded lines from emitting noise.

Also provided:

- **Transient overload protection** to protect the device from voltage spikes on the mains.
- **Starting current limitation** effective for warm devices as well. As a result, even the PS3400 (24 V / 40 A) allows protection using conventional circuit breakers, which are used in the supply line in any case.

In addition to these functions, EMC is also included in the CE certification. These power supplies also satisfy EN 50178, EN 60204-1 and UL508 LISTED requirements in addition to standard international certifications (IEC 60950, EN 60950, UL 60950, CUL CSA-C22.2 No 60950).

Selection guide

	0PS1020.0	0PS1040.0	0PS1025.2	0PS1042.2	0PS1050.1	0PS1100.1	0PS1200.1
Output power	48 W	96 W	60 W	100 W	120 W	240 W	480 W
AC input voltage	85-264 V	85-264 V	85-264 V	85-264 V	85-264 V	85-264 V	85-264 V
DC input voltage	90-350 V	90-350 V	95-250 V	95-250 V	-	-	-
Output voltage	22.5-28.5 V	22.5-28.5 V	22.5-29.5 V	22.5-29.5 V	22.5-29.5 V	22.5-29.5 V	22.5-29.5 V
Output current at 24 V	2 A	4 A	2.5 A	4.2 A	5 A	10 A	20 A
Parallel operation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of phases	1	1	1	1	1	1	1
Page	288	288	288	288	289	289	289

	0PS3050.1	0PS3100.1	0PS3200.1	0PS3400.1
Output power	120 W	240 W	480 W	960 W
AC input voltage	320-575 V	320-575 V	320-575 V	320-575 V
DC input voltage	-	-	-	-
Output voltage	22.5-29.5 V	22.5-29.5 V	22.5-29.5 V	22.5-29.5 V
Output current at 24 V	5 A	10 A	20 A	40 A
Parallel operation	Yes	Yes	Yes	Yes
Number of phases	2/3	2/3	2/3	2/3
Page	290	290	290	290

Single-phase power supplies

0PS1020.0, 0PS1040.0, 0PS1025.2, 0PS1042.2



General information	0PS1020.0	0PS1040.0	0PS1025.2	0PS1042.2
Active DC OK switch output	24 V, 20 mA	24 V, 20 mA	-	-
Connection type	Screw clamp connection			
Certification				
CE			Yes	
cULus			Yes	
cURus			Yes	
GOST-R			Yes	
Input	0PS1020.0	0PS1040.0	0PS1025.2	0PS1042.2
Nominal input voltage			100 to 240 VAC	
Input voltage	AC 85 to 264 V (wide range), 45 to 65 Hz DC 90 to 350 V	AC 85 to 264 V (wide range), 45 to 65 Hz DC 90 to 350 V	AC 85 to 264 V (wide range), 45 to 65 Hz DC 95 to 250 V	AC 85 to 264 V (wide range), 45 to 65 Hz DC 95 to 250 V
Input current	Approx. 0.7 A (120 VAC) Approx. 0.4 A (230 VAC) Approx. 0.65 A (90 VDC) Approx. 0.2 A (350 VDC)	Approx. 1.3 A (120 VAC) Approx. 0.8 A (230 VAC)	Approx. 0.8 A (120 VAC) Approx. 0.4 A (230 VAC)	Approx. 1.3 A (120 VAC) Approx. 0.8 A (230 VAC)
Internal fuse	2.5 A, slow-blow	3.15 A, slow-blow	3.15 A, slow-blow	4 A, slow-blow
Output	0PS1020.0	0PS1040.0	0PS1025.2	0PS1042.2
Nominal voltage			24 VDC \pm 1%	
Output power	48 W	96 W	60 W	100 W
Output current				
-25 to 40°C	2.9 A	5.0 A	2.75 A	4.4 A
40 to 55°C	-	-	2.5 A	4.2 A
40 to 60°C	2.0 A	4.0 A	-	-
>55°C	-	-	Derating: 2.5% per °C	Derating: 2.5% per °C
>60°C	Derating: 2.5% per °C	Derating: 2.5% per °C	-	-
Efficiency, reliability	0PS1020.0	0PS1040.0	0PS1025.2	0PS1042.2
Effectiveness	>88% (at 230 VAC and nominal values)	>88% (at 230 VAC and nominal values)	>86% (at 230 VAC and nominal values)	>88% (at 230 VAC and nominal values)
Power loss				
Nominal load	Max. 7 W	Max. 12 W	Max. 9.9 W	Max. 13.2 W
No-load operation	Max. 2 W	Max. 2.5 W	Max. 0.7 W	Max. 0.7 W
Environmental conditions	0PS1020.0	0PS1040.0	0PS1025.2	0PS1042.2
Temperature				
Operation	-25 to 70°C (>60°C derating)	-25 to 70°C (>60°C derating)	-25 to 70°C (>55°C derating)	-25 to 70°C (>55°C derating)
Mechanical characteristics	0PS1020.0	0PS1040.0	0PS1025.2	0PS1042.2
Dimensions				
Width	45 mm	67.5 mm	72 mm	90 mm
Height	99 mm	99 mm	90 mm	90 mm
Depth	107 mm	114.5 mm	61 mm	61 mm

0PS1050.1, 0PS1100.1, 0PS1200.1



General information	0PS1050.1	0PS1100.1	0PS1200.1
Connection type	Screw clamp connection		
Certification			
CE		Yes	
cULus		Yes	
cURus		Yes	
GOST-R		Yes	
Input	0PS1050.1	0PS1100.1	0PS1200.1
Nominal input voltage		100 to 240 VAC	
Input voltage	AC 85 to 264 V (wide range), 45 to 65 Hz	AC 85 to 264 V (wide range), 45 to 65 Hz 300 VAC (temporary)	AC 85 to 264 V (wide range), 45 to 65 Hz
Input current	Approx. 1.65 A (120 VAC) Approx. 0.9 A (230 VAC)	Approx. 3 A (100 VAC) Approx. 1.5 A (240 VAC)	Approx. 4.6 A (120 VAC) Approx. 2.4 A (230 VAC)
Internal fuse	3.15 A, slow-blow	6.3 A, slow-blow	10 A, slow-blow
Input voltage <90 VAC	-	Derating of the output current: 2.5% per °C	Derating of the output current: 2.5% per °C
Output	0PS1050.1	0PS1100.1	0PS1200.1
Nominal voltage		24 VDC ±1%	
Output power	120 W	240 W	480 W
Output current			
-25 to 55°C	5.0 A	10.0 A	20.0 A
>55°C		Derating: 2.5% per °C	
Efficiency, reliability	0PS1050.1	0PS1100.1	0PS1200.1
Effectiveness	>89%	>89%	>91%
Power loss			
Nominal load	Max. 18 W	Max. 30 W	Max. 46 W
No-load operation	Max. 1.1 W	Max. 6.7 W	Max. 4 W
Environmental conditions	0PS1050.1	0PS1100.1	0PS1200.1
Temperature			
Operation		-25 to 70°C (>55°C derating)	
Mechanical characteristics	0PS1050.1	0PS1100.1	0PS1200.1
Dimensions			
Width	40 mm	60 mm	115 mm
Height		130 mm	
Depth	115 mm	152.5 mm	152.5 mm

Three-phase power supplies

0PS3050.1, 0PS3100.1, 0PS3200.1, 0PS3400.1



General information	0PS3050.1	0PS3100.1	0PS3200.1	0PS3400.1
Connection type			Screw clamp connection	
Certification				
CE			Yes	
cULus			Yes	
cURus			Yes	
GOST-R			Yes	
Input	0PS3050.1	0PS3100.1	0PS3200.1	0PS3400.1
Nominal input voltage			2/3x 400 to 500 VAC	
Input voltage			3x 320 to 575 VAC, 45 to 65 Hz 2x 360 to 575 VAC, 45 to 65 Hz	
Input current	Approx. 3x 0.3 A (400 VAC) Approx. 3x 0.3 A (500 VAC) Approx. 2x 0.65 A (400 VAC) Approx. 2x 0.5 A (500 VAC)	3x 0.6 A (400 VAC) 3x 0.5 A (480 VAC)	3x 1.1 A (400 VAC) 3x 0.8 A (480 VAC)	3x 2.0 A (400 VAC) 3x 1.6 A (480 VAC)
Required line fuse for device and line protection	2/3x 6 A (characteristic B) 2/3x 10 A (characteristic B) 2/3x 16 A (characteristic B)	2/3x 6 A (characteristic B) 2/3x 10 A (characteristic B) 2/3x 16 A (characteristic B)	2/3x 6 A (characteristic B) 2/3x 10 A (characteristic B) 2/3x 16 A (characteristic B)	2/3x 10 A (characteristic B) 2/3x 16 A (characteristic B)
Output	0PS3050.1	0PS3100.1	0PS3200.1	0PS3400.1
Nominal voltage			24 VDC ±1%	
Output power	120 W	240 W	480 W	960 W
Output current				
-25 to 55°C	5.0 A	10.0 A	20.0 A	40.0 A
>55°C			Derating: 2.5% per °C	
Efficiency, reliability	0PS3050.1	0PS3100.1	0PS3200.1	0PS3400.1
Effectiveness	>89%	>88.5%	>91%	>91.5%
Power loss				
Nominal load	Max. 15 W	Max. 34 W	Max. 48 W	87 W
No-load operation	Max. 4 W	Max. 7.5 W	Max. 6 W	11 W
Environmental conditions	0PS3050.1	0PS3100.1	0PS3200.1	0PS3400.1
Temperature				
Operation			-25 to 70°C (>55°C derating)	
Mechanical characteristics	0PS3050.1	0PS3100.1	0PS3200.1	0PS3400.1
Dimensions				
Width	40 mm	60 mm	115 mm	139 mm
Height			130 mm	
Depth	115 mm	152.5 mm	152.5 mm	190 mm

Buffer module

0PB0200.1



General information

Active DC OK switch output	24 V, 20 mA
Connection type	Screw clamp connection
Certification	
CE	Yes
cULus	Yes
cURus	Yes
GOST-R	Yes

Charging mode (input)

Internal fuse	Yes
Loading time	<27 s
Power consumption	20.6 A (max.)
Nominal voltage	24 VDC
Input voltage range	22.5 to 30 VDC
Current consumption	
No-load operation	0.1 A
Loading procedure	0.6 A
Protective circuit	Transient overvoltage protection - Suppressor diode, 35 VDC
Reverse polarity protection	Yes

Buffer operation (output)

Buffer current	Up to 20 A
Current limitation	27 A (buffer mode)
Buffer voltage	$U_{IN} - 0.8 \text{ V}$ and $>22.0 \text{ V}$
Buffer time	0.2 s at 20 A and 4 s at 1 A
Setting range for buffer voltage	22 - 28.5 VDC
Cutoff	>4.5 s (buffer operation)

Output

Nominal voltage	24 VDC (depending on input voltage)
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Efficiency, reliability

Effectiveness	>95% (at 27 A)
Power loss	
Readiness at 27 A	Max. 2.5 W
Buffer operation at 27 A	Max. 9.8 W

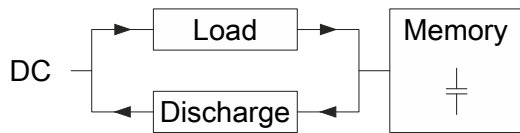
Environmental conditions

Temperature	
Operation	-25 to 70°C

Mechanical characteristics

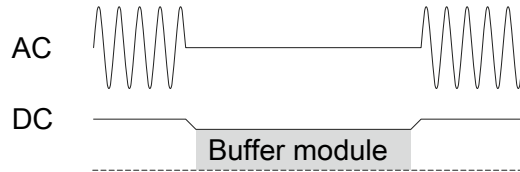
Dimensions	
Width	64 mm 122 mm (mounted sideways)
Height	130 mm
Depth	125 mm 67 mm (mounted sideways)

Buffer module



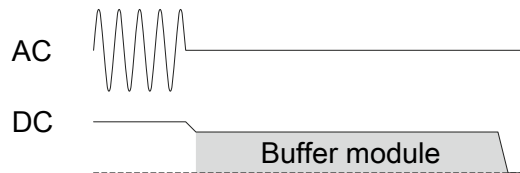
Function principle and application

The buffer module is an accessory for regulated 24 VDC power supplies. The energy from the DC circuit is stored in capacitors and then used in the event of a power failure or to handle overloads. Machines and systems can be easily equipped with this buffer module for use worldwide in unstable power circuits. With buffering times less than 4 seconds, this is an ideal alternative to a DC UPS (less expensive, requires less space and maintenance-free). When short-term current peaks occur, it provides the required energy, therefore preventing the otherwise common error of overdimensioning the power supply.

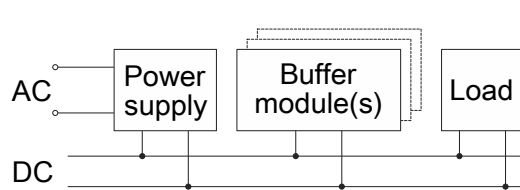


Protection during power supply failures

Statistics show that 80% of all power failures occur in 0.2 seconds or less. These power failures are completely bypassed and do not affect the DC voltage, which increases the reliability and availability of the complete system.



After a power failure or shutdown, the buffer module delivers the load current for a specified amount of time and reports the loss of power via signal terminals. Process data can be saved and processes terminated before the DC voltage is switched off. It is then possible to perform a controlled restart.



Easy to operate, expandable and maintenance-free

The buffer module does not require any control lines and can be connected in parallel at any location in the load current circuit. Five buffer modules can be connected in parallel for redundancy or to extend the buffering time, while dual terminals make wiring fast and easy.

Uninterruptible power supplies

9A0100.11



General information

Certification	
CE	Yes
cULus	Yes
GOST-R	Yes

Interfaces

COM1	
Type	RS232 ¹⁾
Design	9-pin male DSUB connector

Electrical characteristics

Fuse	Yes, for mains supply, battery, battery charger ²⁾
Deep discharge protection	Yes, cutoff threshold 21 VDC
Output during battery operation	
Voltage range	21 to 26.8 VDC (40°C) or 28.2 VDC (0°C)
Nominal voltage value	24 VDC
Max. output current	8 A (load-side)
Output during mains operation	
Voltage range	20 to 30 VDC or 23.5 to 30 VDC depending on the configured switching threshold ³⁾
Nominal voltage value	24 VDC
Max. output current	8 A
Input during mains operation ⁴⁾	
Power failure bypass	Max. 20 minutes at 150 W load
Voltage range	20 to 30 VDC at a switching threshold of 18 V 23.5 to 30 VDC at a switching threshold of 21.5 V ³⁾
Nominal voltage value	24 VDC
Battery switching threshold	18 V

Environmental conditions

Temperature	
Operation	0 to 55°C

Mechanical characteristics

Dimensions	
Width	185 mm
Height	115 mm
Depth	69 mm

¹⁾ CTS (Clear To Send): Signals power failure
DCD (Data Carrier Detect): Signals shutdown
DTR (Data Terminal Ready): Signals remote shutdown of the UPS

²⁾ The charging unit fuse is not necessary with Revision L0 and higher.

³⁾ Can be set using B&R UPS configuration software or HyperTerminal (18 or 21.5 VDC).

⁴⁾ Regulated DC voltage

Uninterruptible power supplies

9A0100.12, 9A0100.14, 9A0100.16



General information	9A0100.12	9A0100.14	9A0100.16
Battery			
Service life	Up to 10 years ¹⁾	Up to 5 years ¹⁾	Up to 15 years ²⁾
Design	Maintenance-free lead acid battery	Maintenance-free lead acid battery	Single cell
Temperature sensor		NTC resistance	
Maintenance interval during storage		6-month interval between charges	
Certification			
CE		Yes	
cULus		Yes	
GOST-R		Yes	
Electrical characteristics	9A0100.12	9A0100.14	9A0100.16
Nominal voltage		24 V	
Capacity	7.2 Ah	2.2 Ah	4.5 Ah
Fuse		Yes	
Environmental conditions	9A0100.12	9A0100.14	9A0100.16
Temperature			
Operation	0 to 40°C ³⁾	0 to 40°C ³⁾	-40 to 80°C ³⁾
Mechanical characteristics	9A0100.12	9A0100.14	9A0100.16
Dimensions			
Width	202 mm	115 mm	145 mm
Length	155.5 mm	181.5 mm	223.2 mm
Height	116 mm	78 mm	78.2 mm

¹⁾ Depends on the ambient temperature and charge/discharge cycles.

²⁾ Depends on the ambient temperature and the charge/discharge cycles at 20 °C (up to 80% battery capacity).

³⁾ Battery backing is no longer provided if the temperature falls below the minimum temperature or rises above the maximum temperature. Charging also no longer takes place since this could lead to battery damage.

9A0100.13, 9A0100.15, 9A0100.17



General information	9A0100.13	9A0100.15	9A0100.17
Battery			
Service life	Up to 10 years ¹⁾	Up to 5 years ¹⁾	Up to 15 years ¹⁾
Design	Maintenance-free lead acid battery	Maintenance-free lead acid battery	Single cell
Maintenance interval during storage		6-month interval between charges	
Certification			
CE		Yes	
cULus		Yes	
GOST-R	Yes	Yes	-
Electrical characteristics	9A0100.13	9A0100.15	9A0100.17
Nominal voltage		12 V	
Capacity	7.2 Ah	2.2 Ah	4.5 Ah
Environmental conditions	9A0100.13	9A0100.15	9A0100.17
Temperature			
Operation	0 to 40°C ²⁾	0 to 40°C ²⁾	-40 to 80°C ²⁾
Mechanical characteristics	9A0100.13	9A0100.15	9A0100.17
Dimensions			
Width	64.5 mm	34 mm	38 mm
Length	151 mm	117 mm	205 mm
Height	100 mm	66 mm	102 mm

¹⁾ Depends on the ambient temperature and charge/discharge cycles.

²⁾ Battery backing is no longer provided if the temperature falls below the minimum temperature or rises above the maximum temperature. Charging also no longer takes place since this could lead to battery damage.






PANELWARE

Compact operator panels

Together with B&R control systems, compact PANELWARE terminals are the ideal solution for space-saving HMI.

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Product overview



Controller

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Compact HMI

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Power supply

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Remote HMI

PANELWARE operator panels can be placed right where status messages and operating data are displayed and where they can be used for tasks such as setting up the machine.

Compact operator panels

These powerful yet compact panels take up hardly any space and come equipped with keys and an alphanumeric LCD display. They are easily controlled by a PLC using escape sequences.

Panel/Controller variants

PANELWARE controllers are designed as standalone modules. When combined with a range of different graphic panels, they form a perfect configuration that can meet the demands of any application.



Controller module

4C1300.02-510



General information

Certification	
CE	Yes

Controller

Control	Escape sequences / VT100 command set (CAN expansions) / B&R Visual Components
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Interfaces

CAN	
Quantity	1
Design	9-pin male DSUB connector
Transfer rate	Max. 500 kbit/s
Node switches	Yes

Electrical characteristics

Nominal voltage	24 VDC (min. 18 VDC, max. 30 VDC)
Current consumption	95 mA at 24 VDC

Operating conditions

EN 60529 protection	IP20
---------------------	------

Environmental conditions

Temperature	
Operation	0 to 50°C
Relative humidity	
Operation	10 to 95%

Mechanical characteristics

Dimensions	
Width	182 mm
Height	86 mm
Depth	30 mm
Weight	Approx. 500 g

4B1260.00-490, 4B1270.00-490



General information	4B1260.00-490	4B1270.00-490
Operation	Controlled by the PLC using escape sequences (no frame buffer)	Controlled by the PLC using escape sequences (no frame buffer), B&R Visual Components
Certification CE		Yes
24 VDC supply	4B1260.00-490	4B1270.00-490
Power consumption (typ. / max.)	1.8 / 2.5 W	2.8 / 3.3 W
Input voltage		
Minimum	5 VDC	18 VDC
Nominal	5.2 VDC	24 VDC
Maximum	5.5 VDC	30 VDC
Interfaces	4B1260.00-490	4B1270.00-490
COM1		
Type	RS232	-
Design	9-pin male DSUB connector	-
CAN		
Quantity	-	1
Design	-	9-pin male DSUB connector
Transfer rate	-	Max. 500 kbit/s
Electrical isolation	-	Yes
Display	4B1260.00-490	4B1270.00-490
Type		LCD
Resolution		4 x 20 characters
Keys	4B1260.00-490	4B1270.00-490
Function keys		12 with LED (yellow)
Number block		12
Quantity		24 membrane keys
Operating conditions	4B1260.00-490	4B1270.00-490
EN 60529 protection		Front: IP65
Environmental conditions	4B1260.00-490	4B1270.00-490
Temperature		
Operation		0 to 50°C
Relative humidity		
Operation		10 to 90%, non-condensing
Mechanical characteristics	4B1260.00-490	4B1270.00-490
Dimensions		
Width		145 mm
Height		180 mm
Depth		30 mm
Weight		Approx. 500 g

Compact HMI

4B1260.00-390, 4B1270.00-390



General information	4B1260.00-390	4B1270.00-390
Operation	Controlled by the PLC using escape sequences (no frame buffer)	Controlled by the PLC using escape sequences (no frame buffer), B&R Visual Components
Certification CE		Yes
24 VDC supply	4B1260.00-390	4B1270.00-390
Power consumption (typ. / max.)	2.0 / 2.5 W	2.2 / 2.5 W
Input voltage		
Minimum	5 VDC	18 VDC
Nominal	5.2 VDC	24 VDC
Maximum	5.5 VDC	30 VDC
Interfaces	4B1260.00-390	4B1270.00-390
COM1		
Type	RS232	-
Design	9-pin male DSUB connector	-
Max. baud rate	9600 bit/s	-
CAN		
Quantity	-	1
Design	-	9-pin male DSUB connector
Transfer rate	-	Max. 500 kbit/s
Electrical isolation	-	Yes
Display	4B1260.00-390	4B1270.00-390
Type		LCD
Resolution		4 x 20 characters
Keys	4B1260.00-390	4B1270.00-390
Function keys		14 with LED (yellow)
System keys		6
Quantity		20 membrane keys
Operating conditions	4B1260.00-390	4B1270.00-390
EN 60529 protection		Front: IP65
Environmental conditions	4B1260.00-390	4B1270.00-390
Temperature		
Operation		0 to 50°C
Relative humidity		
Operation		10 to 90%, non-condensing
Mechanical characteristics	4B1260.00-390	4B1270.00-390
Dimensions		
Width		153 mm
Height		120 mm
Depth		43 mm
Weight		Approx. 500 g

4PW035.E300-01, 4PW035.E300-02



General information	4PW035.E300-01	4PW035.E300-02
Operation	Controlled by the PLC using escape sequences (no frame buffer), B&R Visual Components	B&R Visual Components
Certification		
CE		Yes
24 VDC supply	4PW035.E300-01	4PW035.E300-02
Input voltage		24 VDC \pm 25%
Power consumption (typ. / max.)		Max. 6 W
Interfaces	4PW035.E300-01	4PW035.E300-02
CAN		
Design	9-pin male DSUB connector	-
Transfer rate	Max. 500 kbit/s	-
Electrical isolation	Yes	-
X2X		
Design	-	8-pin male multipoint connector
Electrical isolation	-	Yes
Display	4PW035.E300-01	4PW035.E300-02
Type		Monochrome LCD
Resolution		160 x 80 pixels
Display character set		European/Cyrillic
Keys	4PW035.E300-01	4PW035.E300-02
System keys		Number block, control keys
Quantity		26 (10 with LED)
Operating conditions	4PW035.E300-01	4PW035.E300-02
EN 60529 protection		Front: IP65
Environmental conditions	4PW035.E300-01	4PW035.E300-02
Temperature		
Operation		0 to 50°C
Relative humidity		
Operation		5 to 95%, non-condensing
Mechanical characteristics	4PW035.E300-01	4PW035.E300-02
Dimensions		
Width		153 mm
Height		120 mm
Depth		46.1 mm
Weight		Approx. 500 g

Power supply for P12x

4A0027.00-000



General information

Certification	
CE	Yes

24 VDC supply

Connection	3-pin male multipoint connector
Power consumption	Max. 7.5 W
Input voltage	
Minimum	18 VDC
Nominal	24 VDC
Maximum	30 VDC

Interfaces

COM1	
Type	RS232
Design	9-pin male DSUB connector
Interface to panel	
Connection	Cable for panel connection included in delivery
Design	10-pin connector
Electrical isolation	No

Environmental conditions

Temperature	
Operation	0 to 50°C
Relative humidity	
Operation	5 to 95%

Mechanical characteristics

Dimensions	
Width	114 mm
Height	85.5 mm
Depth	31 mm
Weight	135 g





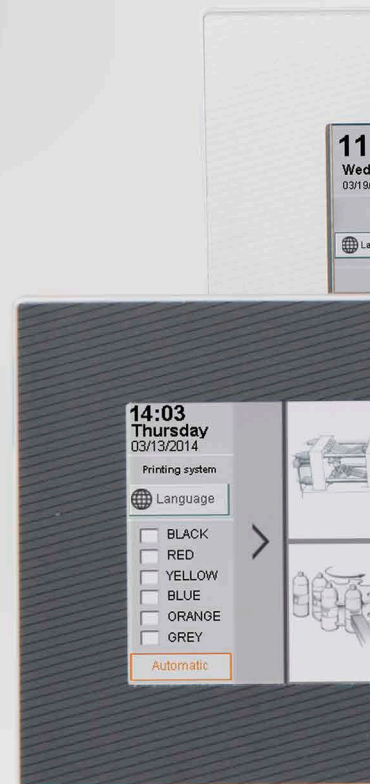
Power Panel

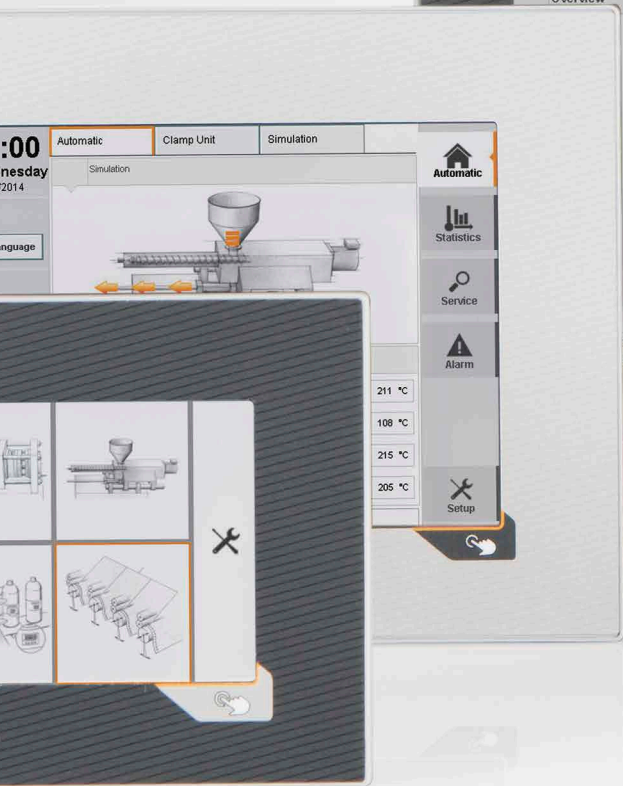
Integrated control, operation and visualization

Compact and intelligent Power Panel devices are the first choice for automating small to mid-sized machines and systems with tight space requirements.

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Product overview

Power Panel



Power Panel PP65

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Power Panel PP65 interface modules

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Power Panel T-Series

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Power Panel C-Series

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Power Panel C-Series interfaces

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T-Series / C-Series accessories



Cage clamp terminal block

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Screw clamp terminal block

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System features

PP65

Display and interfaces provide maximum flexibility

The PP65 provides maximum flexibility with two different display types with identical installation dimensions: a 5.7" model with touch screen (and no function keys) and a 3.5" model with touch screen and 30 function keys. Equipped with 2 USB interfaces and a Fast Ethernet port for exchanging data with higher level systems, the PP65 is also available with integrated X2X Link or POWERLINK interface options for connecting remote I/O modules and drives. These systems can be further extended with RS232/RS485, CAN bus and PROFIBUS DP slave interfaces to meet any requirement.

Perfect for multi-axis applications

The PP65 is equipped with a powerful Geode LX800 processor with 500 MHz, making this system ideal for multi-axis applications that require high computing performance but have limited space in the control cabinet.



General technical data

CPU	Geode LX800 500 MHz CPU
Memory	128 MB SDRAM 232 kB SRAM, nonvolatile CompactFlash program memory

Overview

Model number	4PP065.0351-P74	4PP065.0351-X74	4PP065.0571-P74	4PP065.0571-X74	4PP065.0571-P74F	4PP065.0571-X74F
Figure						
Display	Color TFT					
Resolution	QVGA					
Display size	3.5"		5.7"			
Touch screen	Analog resistive					
Keys	30		-		10	
Slots for interface modules	1					
Interfaces						
Ethernet 10/100	1					
POWERLINK	1	-	1	-	1	-
X2X Link	-	1	-	1	-	1
USB 2.0	2					

System features

Terminal and controller designs with touch screen

B&R is expanding its successful line of Power Panel systems by adding two more series: the Power Panel T-Series terminal version and the Power Panel C-Series controller version. Both versions are equipped with an analog resistive touch screen. Equipped with an embedded browser, Power Panel T30 terminal devices are fully web-compatible and can also be used as a Visual Components client.

T-Series

Power Panel with terminal functionality



The Power Panel T30 is a dedicated visualization terminal and can be operated in 2 different modes. It can be operated as a web browser device using standard technology (frameless full screen mode). Alternatively, it is also optimized for use with Visual Components. The user simply selects the desired mode during configuration. Communication is handled via standard Ethernet – ensuring all the advantages of its easy and affordable cabling.

Integrated cable mounts

- Simple and robust stress relief
- Mounting plates integrated on the housing
- Optimally placed cable outlet

2x standard Ethernet

- RJ45 10/100 Mbit/s
- With integrated switch
- For simple daisy chain wiring

2x USB 2.0

- For device updates
- For connecting standard USB devices
- Access from the application using function libraries

Configuration options

- Automatically via the controller CPU
- Via the USB flash drive
- Via the integrated service page

C-Series

Power Panel with controller functionality

The Power Panel C70 controller is equipped with a 333 MHz Intel Atom CPU, 256 MB DDRAM, 16 kB FRAM and 2 GB onboard flash drive. The Power Panel C70 achieves cycle times as fast as 1 ms. POWERLINK and standard Ethernet, 2x USB 2.0 and X2X Link, as well as optional RS232, RS485 and CAN interfaces meet all connection requirements.

POWERLINK

- For remote connection of I/O modules, motion axes and safety equipment

USB 2.0

- For updates and the application

Optional interface board

- 2x CAN
- 1x CAN + 1x RS232
- 1x CAN + 1x RS485

Standard Ethernet

- 10/100 Mbit/s for example for OPC UA

I/O interface

- X2X Link for direct I/O connections

Cable outlet

- Optimized cable outlet
- 5.7" (side)
- 7" (side)
- 10.1" (bottom)



T-Series / C-Series features



The touch button:

In the lower right corner of the monitor there is a button integrated into the panel overlay design. This touch button can be incorporated as a distinctive feature of your HMI application – as an elegant home or help function, for example.



The models:

The Power Panel T-Series and C-Series are available in portrait and landscape format. The touch button is located optimally in the lower right corner, so whichever format you select, it is always in the right position.










Design:

Anthracite gray with pinstripes or aluminum white with pinstripes: The perfect color for nearly all installations, available in both portrait and landscape format. These stylish pinstripe colors accentuate the quality of your HMI device and machine.






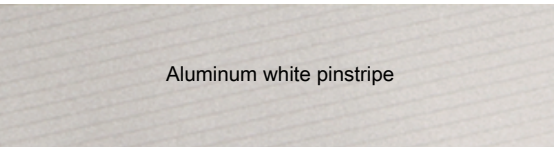
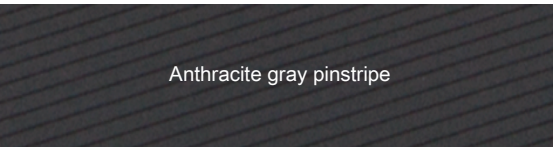





Configuration

T-Series configuration

Display size		
<p>The Power Panel T-Series is available in four different display sizes:</p> <p>4.3" model 5.7" model 7.0" model 10.1" model</p>	<p>4.3" 6PPT30.043x-20x</p>  <p>7" 6PPT30.070x-20x</p> 	<p>5.7" 6PPT30.057x-20x</p>  <p>10.1" 6PPT30.101x-20x</p> 
Resolution		
<p>The option to choose between portrait and landscape format adds even more flexibility to the machine layout.</p>	<p>Landscape format</p>  <p>6PPT30.043F-20x 6PPT30.0573-20x 6PPT30.0702-20x 6PPT30.101G-20x</p>	<p>Portrait format</p>  <p>6PPT30.043K-20x 6PPT30.057L-20x 6PPT30.070M-20x 6PPT30.101N-20x</p>
Panel overlay		
<p>The pinstripe design is available in aluminum white or anthracite gray.</p>	<p>Aluminum white pinstripe</p> <p>6PPT30.043x-20W 6PPT30.057x-20W 6PPT30.070x-20W 6PPT30.101x-20W</p>	<p>Anthracite gray pinstripe</p> <p>6PPT30.043x-20B 6PPT30.057x-20B 6PPT30.070x-20B 6PPT30.101x-20B</p>
Terminal block		
<p>Either screw clamp or cage clamp terminal blocks can be used. They must be ordered separately.</p>	<p>For 6PPT30.xxxx-20x</p> <p>0TB6102.2010-01 - 2-pin accessory screw clamp terminal block or 0TB6102.2110-01 - 2-pin accessory cage clamp terminal block</p>	<p>0TB6102.2010-01 0TB6102.2110-01</p> 

C-Series configuration

Display size						
<p>The Power Panel C-Series is available in three different display sizes:</p> <p>5.7" model 7.0" model 10.1" model</p>	<p>5.7"</p>  <p>4PPC70.057x-2xx</p>		<p>7"</p>  <p>4PPC70.070x-2xx</p>		<p>10.1"</p>  <p>4PPC70.101x-2xx</p>	
Resolution						
<p>The option to choose between portrait and landscape format adds even more flexibility to the machine layout.</p>	<p>Landscape format</p>  <p>4PPC70.0573-2xx 4PPC70.0702-2xx 4PPC70.101G-2xx</p>			<p>Portrait format</p>  <p>4PPC70.057L-2xx 4PPC70.070M-2xx 4PPC70.101N-2xx</p>		
Interfaces on option board						
<p>The option board gives the Power Panel two additional interfaces.</p>	<p>No option board 4PPC70.xxxx-20x</p>		<p>2x CAN bus 4PPC70.xxxx-21x</p>		<p>1x RS232, 1x CAN bus 4PPC70.xxxx-22x</p>	
<p>1x RS485, 1x CAN-Bus 4PPC70.xxxx-23x</p>						
Panel overlay						
<p>The pinstripe design is available in aluminum white or anthracite gray.</p>	<p>Aluminum white pinstripe</p>  <p>4PPC70.057x-2xW 4PPC70.070x-2xW 4PPC70.101x-2xW</p>			<p>Anthracite gray pinstripe</p>  <p>4PPC70.057x-2xB 4PPC70.070x-2xB 4PPC70.101x-2xB</p>		
Terminal block						
<p>Either screw clamp or cage clamp terminal blocks can be used. They must be ordered separately.</p>	<p>For 4PPC70.xxxx-2xx</p> <p>0TB6102.2010-01 - 2-pin accessory screw clamp terminal block or 0TB6102.2110-01 - 2-pin accessory cage clamp terminal block and each 0TB5104.2110-01 - 4-pin accessory cage clamp terminal block</p>		<p>0TB6102.2010-01 0TB6102.2110-01</p> 		<p>0TB5104.2110-01</p> 	
<p>For 4PPC70.xxxx-21x, 4PPC70.xxxx-22x and 4PPC70.xxxx-23x</p> <p>0TB5106.2110-01 - 6-pin accessory cage clamp terminal block</p>		<p>0TB5106.2110-01</p> 				

Configuration

C-Series

Standard interfaces

Each C-Series Power Panel has the following interfaces on board as standard.

IF1 interface

Fieldbus	POWERLINK managing or controlled node	
Type	Type 4	
Design	1x RJ45 shielded	
Status LED	Yes	
Cable length	Max. 100 m between 2 nodes (segment length)	
Max. transfer rate	100 Mbit/s	
Transmission	Physical layer	100BASE-TX
	Half-duplex	Yes
	Full-duplex	POWERLINK mode: No / Ethernet mode: Yes
Autonegotiation	Yes	
Auto-MDI / MDIX	Yes	

IF2 interface

Type	Ethernet	
Design	1x RJ45 shielded	
Status LED	Yes	
Cable length	Max. 100 m between 2 nodes (segment length)	
Max. transfer rate	10/100 Mbit/s	
Transmission	Physical layer	10BASE-T/100BASE-TX
	Half-duplex	Yes
	Full-duplex	Yes
Autonegotiation	Yes	
Auto-MDI / MDIX	Yes	

IF3 interface

Type	USB 2.0	
Design	Type A	
Status LED	No	
Current load	0.49 A	

IF4 interface

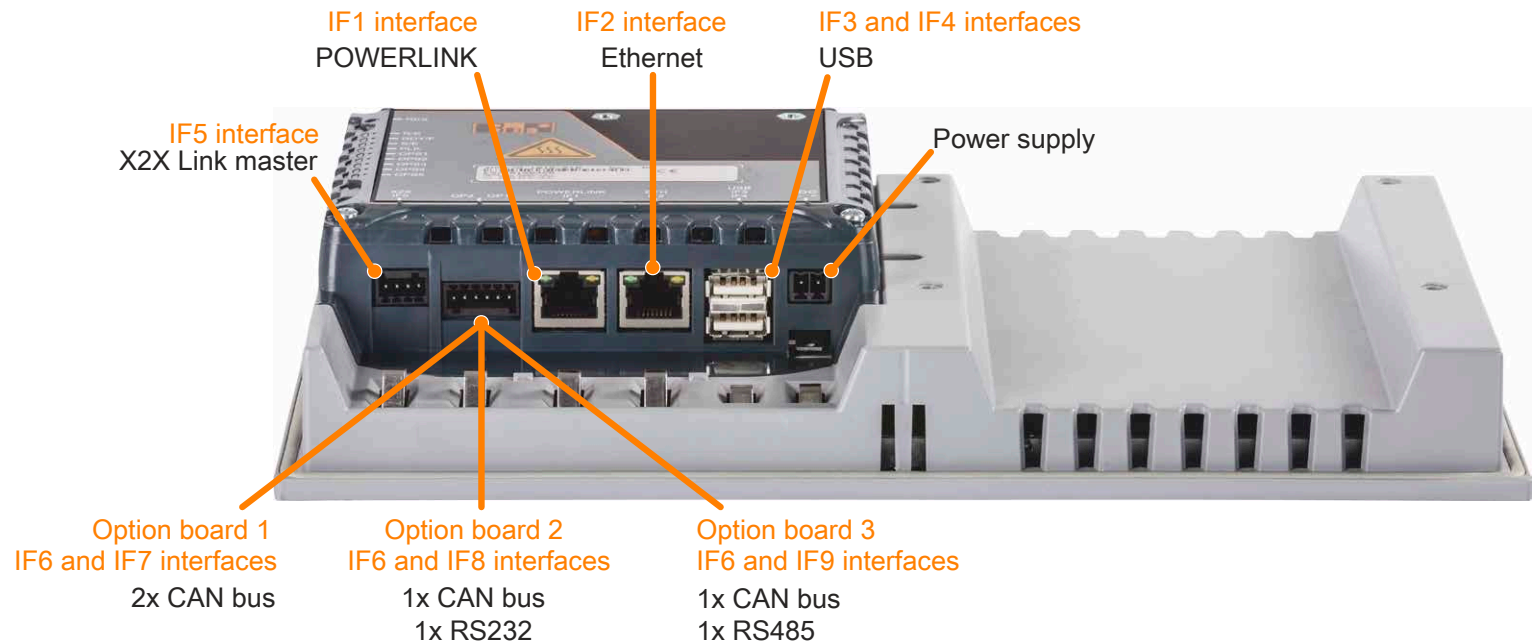
Type	USB 2.0	
Design	Type A	
Status LED	No	
Current load	0.10 A	

IF5 interface

Type	X2X Link master	
Status LED	No	
Required accessories	0TB5104.2110-01	

Power supply

Nominal voltage	24 VDC -15% / +20%	
Status LED	Yes	
Required accessories	0TB6102.2010-01 or 0TB6102.2110-01	



Optional interfaces

C-Series devices are available with the following optional interfaces:

IF6 and IF7 interfaces

Type	CAN bus	
Design	3 pins of the 6-pin multipoint connector	
Status LED	Yes	
Max. distance	1000 m	
Max. transfer rate	Bus length ≤25 m	1 Mbit/s
	Bus length ≤60 m	500 kbit/s
	Bus length ≤200 m	250 kbit/s
	Bus length ≤1000 m	50 kbit/s
Required accessories	0TB5106.2110-01	

IF8 interface

Type	RS232
Design	3 pins of the 6-pin multipoint connector
Status LED	Yes
Max. distance	900 m
Transfer rate	Max. 115.2 kbit/s
Required accessories	0TB5106.2110-01

IF9 interface

Type	RS485
Design	3 pins of the 6-pin multipoint connector
Status LED	Yes
Max. distance	1200 m
Transfer rate	Max. 115.2 kbit/s
Required accessories	0TB5106.2110-01



The interfaces are selected using the order number:

4PPC70.xxxx-20x

- Standard interfaces

4PPC70.xxxx-21x

- Standard interfaces
- IF6 interface - CAN bus
- IF7 interface - CAN bus

4PPC70.xxxx-22x

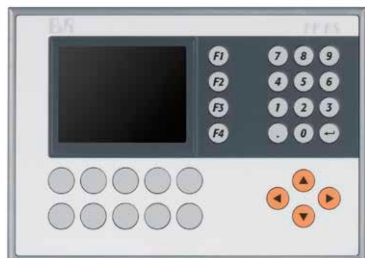
- Standard interfaces
- IF6 interface - CAN bus
- IF8 interface - RS232

4PPC70.xxxx-23x

- Standard interface
- IF6 interface - CAN bus
- IF9 interface - RS485

Power Panel PP65

4PP065.0351-P74, 4PP065.0351-X74



General information	4PP065.0351-P74	4PP065.0351-X74
LED status indicators		
Quantity		4
Battery		
Service life		4 years ¹⁾
Design		Lithium ion
Backup capacitor		
Buffer time		10 min
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
Controller	4PP065.0351-P74	4PP065.0351-X74
Processor		
Type		Geode LX800, 32-bit x86
Clock frequency		500 MHz
L2 cache		128 kB
Flash		4 MB (for firmware)
Mode/Node switches		2, 16 positions each
Remanent variables		32 kB
Watchdog		MTCX ²⁾
Graphics		
Controller		Geode LX800
Memory		8 MB shared memory (allocated in RAM)
Standard memory		
RAM		128 MB DDR SDRAM
User RAM		232 kB SRAM
PP65 Compact IF slot		1
Interfaces	4PP065.0351-P74	4PP065.0351-X74
CompactFlash slot 1		
Type		Type I
USB		
Quantity		2
Type		USB 2.0
Ethernet		
Quantity		1
Transfer rate		10/100 Mbit/s
POWERLINK		
Quantity	1	-
Transmission	100 Base-T (ANSI/IEEE 802.3)	-
Fieldbus	POWERLINK (V1/V2)	-
Type	Type 4 ³⁾	-
Design	Shielded RJ45 port	-
Transfer rate	100 Mbit/s	-
Status LED	Link/Activity	-
Cable length	Max. 100 m between two stations (segment length)	-
X2X		
Quantity	-	1
Design	-	4-pin male multipoint connector
Number of stations	-	Max. 253
Network topology	-	Line
Terminating resistor	-	Internal

4PP065.0351-P74, 4PP065.0351-X74

Display	4PP065.0351-P74	4PP065.0351-X74
Type	Color TFT	
Display size	3.5" (89 mm)	
Colors	262,144	
Resolution	QVGA, 320 x 240 pixels	
Contrast	700:1	
Touch screen Technology	Analog, resistive	
Keys	4PP065.0351-P74	4PP065.0351-X74
Function keys	14 (with slide-in labels)	
System keys	16 (number block, cursor block, control keys)	
Electrical characteristics	4PP065.0351-P74	4PP065.0351-X74
Nominal voltage	24 VDC \pm 25%	
Nominal current	0.45 A	
Operating conditions	4PP065.0351-P74	4PP065.0351-X74
EN 60529 protection	Back: IP20 (only with an inserted CompactFlash card) Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection	
Environmental conditions	4PP065.0351-P74	4PP065.0351-X74
Temperature Operation	0 to 50°C	
Mechanical characteristics	4PP065.0351-P74	4PP065.0351-X74
Housing Material	Polyester	
Dimensions		
Width	203 mm	
Height	145 mm	
Depth	56.5 mm	

¹⁾ Typical service life (at 50% buffer operation: 25°C when device off, 50°C when device on).
Maximum service life in 24h operation (no buffer): 6 years at 25°C, 5 years at 50°C.
Maximum service life when device switched off: 2 years at 25°C, 1 year at 50°C.

²⁾ Maintenance Controller Extended.

³⁾ See the help system in Automation Studio under "Communication / POWERLINK / General information / Hardware - IF/LS".

Power Panel PP65

4PP065.0571-P74, 4PP065.0571-X74



General information	4PP065.0571-P74	4PP065.0571-X74
LED status indicators		
Quantity		4
Battery		
Service life		4 years ¹⁾
Design		Lithium ion
Backup capacitor		
Buffer time		10 min
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
Controller	4PP065.0571-P74	4PP065.0571-X74
Processor		
Type		Geode LX800, 32-bit x86
Clock frequency		500 MHz
L2 cache		128 kB
Flash		4 MB (for firmware)
Mode/Node switches		2, 16 positions each
Remanent variables		32 kB
Watchdog		MTCX ²⁾
Graphics		
Controller		Geode LX800
Memory		8 MB shared memory (allocated in RAM)
Standard memory		
RAM		128 MB DDR SDRAM
User RAM		232 kB SRAM
PP65 Compact IF slot		1
Interfaces	4PP065.0571-P74	4PP065.0571-X74
CompactFlash slot 1		
Type		Type I
USB		
Quantity		2
Type		USB 2.0
Ethernet		
Quantity		1
Transfer rate		10/100 Mbit/s
POWERLINK		
Quantity	1	-
Transmission	100 Base-T (ANSI/IEEE 802.3)	-
Fieldbus	POWERLINK (V1/V2)	-
Type	Type 4 ³⁾	-
Design	Shielded RJ45 port	-
Transfer rate	100 Mbit/s	-
Status LED	Link/Activity	-
Cable length	Max. 100 m between two stations (segment length)	-
X2X		
Quantity	-	1
Design	-	4-pin male multipoint connector
Number of stations	-	Max. 253
Network topology	-	Line
Terminating resistor	-	Internal

4PP065.0571-P74, 4PP065.0571-X74

Display	4PP065.0571-P74	4PP065.0571-X74
Type	Color TFT	
Display size	5.7" (144 mm)	
Colors	262,144	
Resolution	QVGA, 320 x 240 pixels	
Contrast	350:1	
Touch screen Technology	Analog, resistive	
Electrical characteristics	4PP065.0571-P74	4PP065.0571-X74
Nominal voltage	24 VDC ±25%	
Nominal current	0.45 A	
Operating conditions	4PP065.0571-P74	4PP065.0571-X74
EN 60529 protection	Back: IP20 (only with an inserted CompactFlash card) Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection	
Environmental conditions	4PP065.0571-P74	4PP065.0571-X74
Temperature Operation	0 to 50°C	
Mechanical characteristics	4PP065.0571-P74	4PP065.0571-X74
Housing Material	Polyester	
Dimensions		
Width	203 mm	
Height	145 mm	
Depth	56.5 mm	

¹⁾ Typical service life (at 50% buffer operation: 25°C when device off, 50°C when device on).
Maximum service life in 24h operation (no buffer): 6 years at 25°C, 5 years at 50°C.
Maximum service life when device switched off: 2 years at 25°C, 1 year at 50°C.

²⁾ Maintenance Controller Extended.

³⁾ See the help system in Automation Studio under "Communication / POWERLINK / General information / Hardware - IF/LS".

Power Panel PP65

4PP065.0571-P74F, 4PP065.0571-X74F



General information	4PP065.0571-P74F	4PP065.0571-X74F
LED status indicators		
Quantity		4
Battery		
Service life		4 years ¹⁾
Design		Lithium ion
Backup capacitor		
Buffer time		10 min
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
Controller	4PP065.0571-P74F	4PP065.0571-X74F
Processor		
Type		Geode LX800, 32-bit x86
Clock frequency		500 MHz
L2 cache		128 kB
Flash		4 MB (for firmware)
Mode/Node switches		2, 16 positions each
Remanent variables		32 kB
Watchdog		MTCX ²⁾
Graphics		
Controller		Geode LX800
Memory		8 MB shared memory (allocated in RAM)
Standard memory		
RAM		128 MB DDR SDRAM
User RAM		232 kB SRAM
PP65 Compact IF slot		1
Interfaces	4PP065.0571-P74F	4PP065.0571-X74F
CompactFlash slot 1		
Type		Type I
USB		
Quantity		2
Type		USB 2.0
Ethernet		
Quantity		1
Transfer rate		10/100 Mbit/s
POWERLINK		
Quantity	1	-
Transmission	100 Base-T (ANSI/IEEE 802.3)	-
Fieldbus	POWERLINK (V1/V2)	-
Type	Type 4 ³⁾	-
Design	Shielded RJ45 port	-
Transfer rate	100 Mbit/s	-
Status LED	Link/Activity	-
Cable length	Max. 100 m between two stations (segment length)	-
X2X		
Quantity	-	1
Design	-	4-pin male multipoint connector
Number of stations	-	Max. 253
Network topology	-	Line
Terminating resistor	-	Internal

4PP065.0571-P74F, 4PP065.0571-X74F

Display	4PP065.0571-P74F	4PP065.0571-X74F
Type	Color TFT	
Display size	5.7" (144 mm)	
Colors	262,144	
Resolution	QVGA, 320 x 240 pixels	
Contrast	350:1	
Touch screen Technology	Analog, resistive	
Keys	4PP065.0571-P74F	4PP065.0571-X74F
Function keys	10 (with slide-in labels)	
Electrical characteristics	4PP065.0571-P74F	4PP065.0571-X74F
Nominal voltage	24 VDC \pm 25%	
Nominal current	0.45 A	
Operating conditions	4PP065.0571-P74F	4PP065.0571-X74F
EN 60529 protection	Back: IP20 (only with an inserted CompactFlash card) Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection	
Environmental conditions	4PP065.0571-P74F	4PP065.0571-X74F
Temperature Operation	0 to 50°C	
Mechanical characteristics	4PP065.0571-P74F	4PP065.0571-X74F
Housing Material	Polyester	
Dimensions		
Width	203 mm	
Height	145 mm	
Depth	56.5 mm	

¹⁾ Typical service life (at 50% buffer operation: 25°C when device off, 50°C when device on).
Maximum service life in 24h operation (no buffer): 6 years at 25°C, 5 years at 50°C.
Maximum service life when device switched off: 2 years at 25°C, 1 year at 50°C.

²⁾ Maintenance Controller Extended.

³⁾ See the help system in Automation Studio under "Communication / POWERLINK / General information / Hardware - IF/LS".

PP65 interface modules

4PP065.IF10-1, 4PP065.IF24-1, 4PP065.IF23-1, 4PP065.IF33-1



Short description	4PP065.IF10-1	4PP065.IF24-1	4PP065.IF23-1	4PP065.IF33-1
Communication module	1x RS232	1x RS232/RS422/RS485, 1x PROFIBUS DP slave	1x RS232/RS422/RS485, 1x CAN	2x CAN bus
General information	4PP065.IF10-1	4PP065.IF24-1	4PP065.IF23-1	4PP065.IF33-1
Certification				
CE			Yes	
cULus			Yes	
GOST-R			Yes	
Interfaces	4PP065.IF10-1	4PP065.IF24-1	4PP065.IF23-1	4PP065.IF33-1
IF1 interface				
Type	RS232	RS232	RS232	CAN bus
Design	9-pin male DSUB connector	9-pin male DSUB connector (shared with IF2)	9-pin male DSUB connector (shared with IF2)	1x 4-pin male multipoint connector
Max. distance	15 m / 19,200 bit/s	15 m / 19,200 bit/s	15 m / 19,200 bit/s	1000 m
Max. transfer rate	115.2 kbit/s	115.2 kbit/s	115.2 kbit/s	1000 kbit/s
IF2 interface				
Type	-	RS485/RS422	RS485/RS422	CAN bus
Design	-	9-pin male DSUB connector (shared with IF1)	9-pin male DSUB connector (shared with IF1)	1x 4-pin male multipoint connector
Max. distance	-	500 m	500 m	1000 m
Max. transfer rate	-	115.2 kbit/s	115.2 kbit/s	1000 kbit/s
IF3 interface				
Fieldbus	-	PROFIBUS DP slave	CAN bus	-
Type	-	RS485	CAN bus	-
Design	-	9-pin female DSUB connector	4-pin male multipoint connector	-
Bus terminating resistor	-	Integrated in the module	Integrated in the module, switchable	-
Controller	-	ASIC SPC3	SJA 1000	-
RAM	-	1.5 kB	-	-
Max. distance	-	1000 m	1000 m	-
Max. transfer rate	-	12 Mbit/s	1 Mbit/s	-
Network-capable	-	Yes	Yes	-
Environmental conditions	4PP065.IF10-1	4PP065.IF24-1	4PP065.IF23-1	4PP065.IF33-1
Temperature				
Operation			0 to 50°C	
Mechanical characteristics	4PP065.IF10-1	4PP065.IF24-1	4PP065.IF23-1	4PP065.IF33-1
Slot			PP65 insert	



Power Panel T-Series

6PPT30.043F-20B, 6PPT30.043F-20W, 6PPT30.043K-20B, 6PPT30.043K-20W



General information	6PPT30.043F-20B	6PPT30.043F-20W	6PPT30.043K-20B	6PPT30.043K-20W
Cooling			Fanless	
LED status indicators			Ethernet	
Electrical isolation				
USB - Ethernet			Yes	
Ethernet - 24 VDC			Yes	
Certification				
CE			Yes	
cULus			Yes	
GOST-R			Yes	
Controller	6PPT30.043F-20B	6PPT30.043F-20W	6PPT30.043K-20B	6PPT30.043K-20W
Operating system			T30 image	
Real-time clock			No	
Processor				
Type			ARM Cortex A8	
Clock frequency			600 MHz	
L2 cache			256 kB	
Flash			512 MB	
Mode/Node switches			No	
DRAM			256 MB	
Interfaces	6PPT30.043F-20B	6PPT30.043F-20W	6PPT30.043K-20B	6PPT30.043K-20W
Switch				
Interface A			IF1 interface	
Interface B			IF2 interface	
IF1 interface				
Type			Ethernet	
Design			1x RJ45 shielded	
Cable length			Max. 100 m between 2 stations (segment length)	
Max. transfer rate			10/100 Mbit/s	
Transmission				
Physical layer			10BASE-T / 100BASE-TX	
Half-duplex			Yes	
Full-duplex			Yes	
Autonegotiation			Yes	
Auto-MDI / MDIX			Yes	
IF2 interface				
Type			Ethernet	
Design			1x RJ45 shielded	
Cable length			Max. 100 m between 2 stations (segment length)	
Max. transfer rate			10/100 Mbit/s	

6PPT30.043F-20B, 6PPT30.043F-20W, 6PPT30.043K-20B, 6PPT30.043K-20W

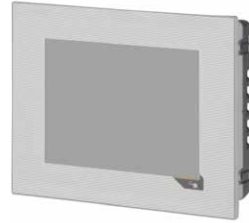
Transmission				
Physical layer	10BASE-T / 100BASE-TX			
Half-duplex	Yes			
Full-duplex	Yes			
Autonegotiation	Yes			
Auto-MDI / MDIX	Yes			
IF3 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.5 A ¹⁾			
IF4 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.2 A ²⁾			
Display	6PPT30.043F-20B	6PPT30.043F-20W	6PPT30.043K-20B	6PPT30.043K-20W
Type	Color TFT			
Display size	4.3"			
Colors	16.7 M			
Resolution	WQVGA, 480 x 272 pixels	WQVGA, 480 x 272 pixels	WQVGA, 272 x 480 pixels	WQVGA, 272 x 480 pixels
Contrast	Typ. 350:1			
Touch screen				
Technology	Analog resistive			
Electrical characteristics	6PPT30.043F-20B	6PPT30.043F-20W	6PPT30.043K-20B	6PPT30.043K-20W
Nominal voltage	8 to 32 VDC			
Max. current at nominal voltage	230 mA			
Operating conditions	6PPT30.043F-20B	6PPT30.043F-20W	6PPT30.043K-20B	6PPT30.043K-20W
EN 60529 protection	Back: IP20 Front: IP65			
Environmental conditions	6PPT30.043F-20B	6PPT30.043F-20W	6PPT30.043K-20B	6PPT30.043K-20W
Temperature				
Operation				
Horizontal installation	-20 to 60°C			
Vertical installation	-20 to 60°C			
Mechanical characteristics	6PPT30.043F-20B	6PPT30.043F-20W	6PPT30.043K-20B	6PPT30.043K-20W
Note	Order terminal blocks 1x OTB6102.2010-01 and 1x OTB6102.2110-01 separately			
Dimensions				
Width	140 mm	140 mm	96 mm	96 mm
Height	96 mm	96 mm	140 mm	140 mm
Depth	38.3 mm			

¹⁾ The maximum current load is 0.1 A for hardware revisions less than B0.

²⁾ The maximum current load is 0.1 A for hardware revisions B0 to B2.
The maximum current load is 0.5 A for hardware revisions less than B0.

Power Panel T-Series

6PPT30.0573-20B, 6PPT30.0573-20W, 6PPT30.057L-20B, 6PPT30.057L-20W



General information	6PPT30.0573-20B	6PPT30.0573-20W	6PPT30.057L-20B	6PPT30.057L-20W
Cooling			Fanless	
LED status indicators			Ethernet	
Electrical isolation				
USB - Ethernet			Yes	
Ethernet - 24 VDC			Yes	
Certification				
CE			Yes	
cULus			Yes	
GOST-R			Yes	
Controller	6PPT30.0573-20B	6PPT30.0573-20W	6PPT30.057L-20B	6PPT30.057L-20W
Operating system			T30 image	
Real-time clock			No	
Processor				
Type			ARM Cortex A8	
Clock frequency			600 MHz	
L2 cache			256 kB	
Flash			512 MB	
Mode/Node switches			No	
DRAM			256 MB	
Interfaces	6PPT30.0573-20B	6PPT30.0573-20W	6PPT30.057L-20B	6PPT30.057L-20W
Switch				
Interface A			IF1 interface	
Interface B			IF2 interface	
IF1 interface				
Type			Ethernet	
Design			1x RJ45 shielded	
Cable length			Max. 100 m between 2 stations (segment length)	
Max. transfer rate			10/100 Mbit/s	
Transmission				
Physical layer			10BASE-T / 100BASE-TX	
Half-duplex			Yes	
Full-duplex			Yes	
Autonegotiation			Yes	
Auto-MDI / MDIX			Yes	
IF2 interface				
Type			Ethernet	
Design			1x RJ45 shielded	
Cable length			Max. 100 m between 2 stations (segment length)	
Max. transfer rate			10/100 Mbit/s	

6PPT30.0573-20B, 6PPT30.0573-20W, 6PPT30.057L-20B, 6PPT30.057L-20W

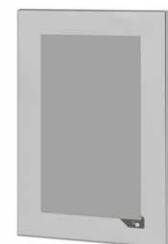
Transmission				
Physical layer	10BASE-T / 100BASE-TX			
Half-duplex	Yes			
Full-duplex	Yes			
Autonegotiation	Yes			
Auto-MDI / MDIX	Yes			
IF3 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.5 A ¹⁾			
IF4 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.2 A ²⁾			
Display	6PPT30.0573-20B	6PPT30.0573-20W	6PPT30.057L-20B	6PPT30.057L-20W
Type	Color TFT			
Display size	5.7"			
Colors	262,000			
Resolution	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels	VGA, 480 x 640 pixels	VGA, 480 x 640 pixels
Contrast	Typ. 850:1			
Touch screen				
Technology	Analog resistive			
Electrical characteristics	6PPT30.0573-20B	6PPT30.0573-20W	6PPT30.057L-20B	6PPT30.057L-20W
Nominal voltage	8 to 32 VDC			
Max. current at nominal voltage	319 mA			
Operating conditions	6PPT30.0573-20B	6PPT30.0573-20W	6PPT30.057L-20B	6PPT30.057L-20W
EN 60529 protection	Back: IP20 Front: IP65			
Environmental conditions	6PPT30.0573-20B	6PPT30.0573-20W	6PPT30.057L-20B	6PPT30.057L-20W
Temperature				
Operation				
Horizontal installation	-20 to 60°C			
Vertical installation	-20 to 60°C			
Mechanical characteristics	6PPT30.0573-20B	6PPT30.0573-20W	6PPT30.057L-20B	6PPT30.057L-20W
Note	Order terminal blocks 1x OTB6102.2010-01 and 1x OTB6102.2110-01 separately			
Dimensions				
Width	172 mm	172 mm	140 mm	140 mm
Height	140 mm	140 mm	172 mm	172 mm
Depth	48 mm			

¹⁾ The maximum current load is 0.1 A for hardware revisions less than B0.

²⁾ The maximum current load is 0.1 A for hardware revisions B0 to B2.
The maximum current load is 0.5 A for hardware revisions less than B0.

Power Panel T-Series

6PPT30.0702-20B, 6PPT30.0702-20W, 6PPT30.070M-20B, 6PPT30.070M-20W



General information	6PPT30.0702-20B	6PPT30.0702-20W	6PPT30.070M-20B	6PPT30.070M-20W
Cooling			Fanless	
LED status indicators			Ethernet	
Electrical isolation				
USB - Ethernet			Yes	
Ethernet - 24 VDC			Yes	
Certification				
CE			Yes	
cULus			Yes	
GOST-R			Yes	
Controller	6PPT30.0702-20B	6PPT30.0702-20W	6PPT30.070M-20B	6PPT30.070M-20W
Operating system			T30 image	
Real-time clock			No	
Processor				
Type			ARM Cortex A8	
Clock frequency			1 GHz ¹⁾	
L2 cache			256 kB	
Flash			512 MB	
Mode/Node switches			No	
DRAM			256 MB	
Interfaces	6PPT30.0702-20B	6PPT30.0702-20W	6PPT30.070M-20B	6PPT30.070M-20W
Switch				
Interface A			IF1 interface	
Interface B			IF2 interface	
IF1 interface				
Type			Ethernet	
Design			1x RJ45 shielded	
Cable length			Max. 100 m between 2 stations (segment length)	
Max. transfer rate			10/100 Mbit/s	
Transmission				
Physical layer			10BASE-T / 100BASE-TX	
Half-duplex			Yes	
Full-duplex			Yes	
Autonegotiation			Yes	
Auto-MDI / MDIX			Yes	
IF2 interface				
Type			Ethernet	
Design			1x RJ45 shielded	
Cable length			Max. 100 m between 2 stations (segment length)	
Max. transfer rate			10/100 Mbit/s	

6PPT30.0702-20B, 6PPT30.0702-20W, 6PPT30.070M-20B, 6PPT30.070M-20W

Transmission				
Physical layer	10BASE-T / 100BASE-TX			
Half-duplex	Yes			
Full-duplex	Yes			
Autonegotiation	Yes			
Auto-MDI / MDIX	Yes			
IF3 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.5 A ²⁾			
IF4 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.2 A ³⁾			
Display	6PPT30.0702-20B	6PPT30.0702-20W	6PPT30.070M-20B	6PPT30.070M-20W
Type	Color TFT			
Display size	7"			
Colors	16.2 M			
Resolution	WVGA, 800 x 480 pixels	WVGA, 800 x 480 pixels	WVGA, 480 x 800 pixels	WVGA, 480 x 800 pixels
Contrast	Typ. 600:1			
Touch screen				
Technology	Analog resistive			
Electrical characteristics	6PPT30.0702-20B	6PPT30.0702-20W	6PPT30.070M-20B	6PPT30.070M-20W
Nominal voltage	8 to 32 VDC			
Max. current at nominal voltage	389 mA			
Operating conditions	6PPT30.0702-20B	6PPT30.0702-20W	6PPT30.070M-20B	6PPT30.070M-20W
EN 60529 protection	Back: IP20 Front: IP65			
Environmental conditions	6PPT30.0702-20B	6PPT30.0702-20W	6PPT30.070M-20B	6PPT30.070M-20W
Temperature				
Operation				
Horizontal installation	-20 to 60°C			
Vertical installation	-20 to 60°C			
Mechanical characteristics	6PPT30.0702-20B	6PPT30.0702-20W	6PPT30.070M-20B	6PPT30.070M-20W
Note	Order terminal blocks 1x OTB6102.2010-01 and 1x OTB6102.2110-01 separately			
Dimensions				
Width	197 mm	197 mm	140 mm	140 mm
Height	140 mm	140 mm	197 mm	197 mm
Depth	48 mm			

¹⁾ The maximum clock frequency is 600 MHz for hardware revisions less than C0.

²⁾ The maximum current load is 0.1 A for hardware revisions less than B0.

³⁾ The maximum current load is 0.1 A for hardware revisions B0 to B2.
The maximum current load is 0.5 A for hardware revisions less than B0.

Power Panel T-Series

6PPT30.101G-20B, 6PPT30.101G-20W, 6PPT30.101N-20B, 6PPT30.101N-20W



General information	6PPT30.101G-20B	6PPT30.101G-20W	6PPT30.101N-20B	6PPT30.101N-20W
Cooling			Fanless	
LED status indicators			Ethernet	
Electrical isolation				
USB - Ethernet			Yes	
Ethernet - 24 VDC			Yes	
Certification				
CE			Yes	
cULus			Yes	
GOST-R			Yes	
Controller	6PPT30.101G-20B	6PPT30.101G-20W	6PPT30.101N-20B	6PPT30.101N-20W
Operating system			T30 image	
Real-time clock			No	
Processor				
Type			ARM Cortex A8	
Clock frequency			1 GHz ¹⁾	
L2 cache			256 kB	
Flash			512 MB	
Mode/Node switches			No	
DRAM			256 MB	
Interfaces	6PPT30.101G-20B	6PPT30.101G-20W	6PPT30.101N-20B	6PPT30.101N-20W
Switch				
Interface A			IF1 interface	
Interface B			IF2 interface	
IF1 interface				
Type			Ethernet	
Design			1x RJ45 shielded	
Cable length			Max. 100 m between 2 stations (segment length)	
Max. transfer rate			10/100 Mbit/s	
Transmission				
Physical layer			10BASE-T / 100BASE-TX	
Half-duplex			Yes	
Full-duplex			Yes	
Autonegotiation			Yes	
Auto-MDI / MDIX			Yes	
IF2 interface				
Type			Ethernet	
Design			1x RJ45 shielded	
Cable length			Max. 100 m between 2 stations (segment length)	
Max. transfer rate			10/100 Mbit/s	

6PPT30.101G-20B, 6PPT30.101G-20W, 6PPT30.101N-20B, 6PPT30.101N-20W

Transmission				
Physical layer	10BASE-T / 100BASE-TX			
Half-duplex	Yes			
Full-duplex	Yes			
Autonegotiation	Yes			
Auto-MDI / MDIX	Yes			
IF3 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.5 A ²⁾			
IF4 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.2 A ³⁾			
Display	6PPT30.101G-20B	6PPT30.101G-20W	6PPT30.101N-20B	6PPT30.101N-20W
Type	Color TFT			
Display size	10.1"			
Colors	256 k			
Resolution	WSVGA, 1024 x 600 pixels	WSVGA, 1024 x 600 pixels	WSVGA, 600 x 1024 pixels	WSVGA, 600 x 1024 pixels
Contrast	Typ. 500:1			
Touch screen				
Technology	Analog resistive			
Electrical characteristics	6PPT30.101G-20B	6PPT30.101G-20W	6PPT30.101N-20B	6PPT30.101N-20W
Nominal voltage	8 to 32 VDC			
Max. current at nominal voltage	429 mA			
Operating conditions	6PPT30.101G-20B	6PPT30.101G-20W	6PPT30.101N-20B	6PPT30.101N-20W
EN 60529 protection	Back: IP20 Front: IP65			
Environmental conditions	6PPT30.101G-20B	6PPT30.101G-20W	6PPT30.101N-20B	6PPT30.101N-20W
Temperature				
Operation				
Horizontal installation	-20 to 60°C			
Vertical installation	-20 to 60°C			
Mechanical characteristics	6PPT30.101G-20B	6PPT30.101G-20W	6PPT30.101N-20B	6PPT30.101N-20W
Note	Order terminal blocks 1x OTB6102.2010-01 and 1x OTB6102.2110-01 separately			
Dimensions				
Width	276 mm	276 mm	172 mm	172 mm
Height	172 mm	172 mm	276 mm	276 mm
Depth	48 mm			

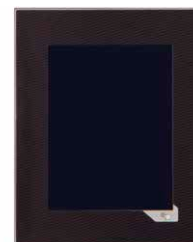
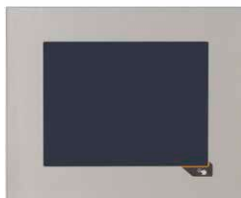
¹⁾ The maximum clock frequency is 600 MHz for hardware revisions less than C0.

²⁾ The maximum current load is 0.1 A for hardware revisions less than B0.

³⁾ The maximum current load is 0.1 A for hardware revisions B0 to B2.
The maximum current load is 0.5 A for hardware revisions less than B0.

Power Panel C-Series

4PPC70.0573-2xx, 4PPC70.057L-2xx



General information

	4PPC70.0573-2xx	4PPC70.057L-2xx
Cooling		Fanless
Controller redundancy		
Master capability		No
ACOPOS capability		Yes
Visual Components support		Yes
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes

Controller

	4PPC70.0573-2xx	4PPC70.057L-2xx
CompactFlash slot		0
Real-time clock ¹⁾		Yes, resolution 1 s
FPU		Yes
Processor		
Type		Intel E620T
Clock frequency		333 MHz compatibility
L1 cache		
Data code		24 kB
Program code		32 kB
L2 cache		-
Mode/Node switches		No
Remanent variables		32 kB
DRAM		256 MB
Typical shortest task class cycle time		1 ms ²⁾
Shortest task class cycle time		0.4 ms
Typical instruction cycle time		0.01 µs
Program memory		
Type		2 GB eMMC flash memory
Data retention		10 years
Guaranteed clear/write cycles		20,000

Display

	4PPC70.0573-2xx	4PPC70.057L-2xx
Type		Color TFT
Display size		5.7"
Colors		262,000
Resolution	VGA, 640 x 480 pixels	VGA, 480 x 640 pixels
Contrast		Typ. 850:1
Touch screen		
Technology		Analog resistive

4PPC70.0573-2xx, 4PPC70.057L-2xx

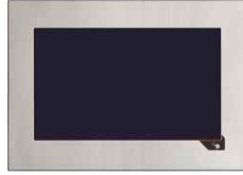
Electrical characteristics	4PPC70.0573-2xx	4PPC70.057L-2xx
Nominal voltage	24 VDC -15% / +20%	
Reverse polarity protection	Yes	
Operating conditions	4PPC70.0573-2xx	4PPC70.057L-2xx
EN 60529 protection	Back: IP20 Front: IP65	
Environmental conditions	4PPC70.0573-2xx	4PPC70.057L-2xx
Temperature		
Operation		
Horizontal installation	0 to 50°C	
Vertical installation	0 to 50°C	
Mechanical characteristics	4PPC70.0573-2xx	4PPC70.057L-2xx
Dimensions		
Width	172 mm	140 mm
Height	140 mm	172 mm
Depth	51 mm	

¹⁾ The real-time clock is buffered for approx. 1000 hours @ 25°C by a gold foil capacitor. The gold foil capacitor is completely charged after 18 continuous hours of operation.

²⁾ Shortest cycle time that is suitable for average applications. In certain cases, it is also possible to use shorter cycle times. The limit for the setting is specified in the entry for the shortest task class cycle time.

Power Panel C-Series

4PPC70.0702-2xx, 4PPC70.070M-2xx



General information	4PPC70.0702-2xx	4PPC70.070M-2xx
Cooling		Fanless
Controller redundancy		
Master capability		No
ACOPOS capability		Yes
Visual Components support		Yes
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
Controller	4PPC70.0702-2xx	4PPC70.070M-2xx
CompactFlash slot		0
Real-time clock ¹⁾		Yes, resolution 1 s
FPU		Yes
Processor		
Type		Intel E620T
Clock frequency		333 MHz compatibility
L1 cache		
Data code		24 kB
Program code		32 kB
L2 cache		-
Mode/Node switches		No
Remanent variables		32 kB
DRAM		256 MB
Typical shortest task class cycle time		1 ms ²⁾
Shortest task class cycle time		0.4 ms
Typical instruction cycle time		0.01 µs
Program memory		
Type		2 GB eMMC flash memory
Data retention		10 years
Guaranteed clear/write cycles		20,000
Display	4PPC70.0702-2xx	4PPC70.070M-2xx
Type		Color TFT
Display size		7"
Colors		262,000 / 16.2 M
Resolution	WVGA, 800 x 480 pixels	WVGA, 480 x 800 pixels
Contrast		Typ. 600:1
Touch screen		
Technology		Analog resistive

4PPC70.0702-2xx, 4PPC70.070M-2xx

Electrical characteristics	4PPC70.0702-2xx	4PPC70.070M-2xx
Nominal voltage	24 VDC -15% / +20%	
Reverse polarity protection	Yes	
Operating conditions	4PPC70.0702-2xx	4PPC70.070M-2xx
EN 60529 protection	Back: IP20 Front: IP65	
Environmental conditions	4PPC70.0702-2xx	4PPC70.070M-2xx
Temperature		
Operation		
Horizontal installation	0 to 50°C	
Vertical installation	0 to 50°C	
Mechanical characteristics	4PPC70.0702-2xx	4PPC70.070M-2xx
Dimensions		
Width	197 mm	140 mm
Height	140 mm	197 mm
Depth	51 mm	

¹⁾ The real-time clock is buffered for approx. 1000 hours @ 25°C by a gold foil capacitor. The gold foil capacitor is completely charged after 18 continuous hours of operation.

²⁾ Shortest cycle time that is suitable for average applications. In certain cases, it is also possible to use shorter cycle times. The limit for the setting is specified in the entry for the shortest task class cycle time.

Power Panel C-Series

4PPC70.101G-2xx, 4PPC70.101N-2xx



General information	4PPC70.101G-2xx	4PPC70.101N-2xx
Cooling		Fanless
Controller redundancy		
Master capability		No
ACOPOS capability		Yes
Visual Components support		Yes
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
Controller	4PPC70.101G-2xx	4PPC70.101N-2xx
CompactFlash slot		0
Real-time clock ¹⁾		Yes, resolution 1 s
FPU		Yes
Processor		
Type		Intel E620T
Clock frequency		333 MHz compatibility
L1 cache		
Data code		24 kB
Program code		32 kB
L2 cache		-
Mode/Node switches		No
Remanent variables		32 kB
DRAM		256 MB
Typical shortest task class cycle time		1 ms ²⁾
Shortest task class cycle time		0.4 ms
Typical instruction cycle time		0.01 µs
Program memory		
Type		2 GB eMMC flash memory
Data retention		10 years
Guaranteed clear/write cycles		20,000
Display	4PPC70.101G-2xx	4PPC70.101N-2xx
Type		Color TFT
Display size		10.1"
Colors		16.2 M
Resolution	WSVGA, 1024 x 600 pixels	WSVGA, 600 x 1024 pixels
Contrast ³⁾		Typ. 500:1
Touch screen		
Technology		Analog resistive

4PPC70.101G-2xx, 4PPC70.101N-2xx

Electrical characteristics	4PPC70.101G-2xx	4PPC70.101N-2xx
Nominal voltage	24 VDC -15% / +20%	
Reverse polarity protection	Yes	
Operating conditions	4PPC70.101G-2xx	4PPC70.101N-2xx
EN 60529 protection	Back: IP20 Front: IP65	
Environmental conditions	4PPC70.101G-2xx	4PPC70.101N-2xx
Temperature		
Operation		
Horizontal installation	0 to 50°C	
Vertical installation	0 to 50°C	
Mechanical characteristics	4PPC70.101G-2xx	4PPC70.101N-2xx
Dimensions		
Width	276 mm	172 mm
Height	172 mm	276 mm
Depth	51 mm	

¹⁾ The real-time clock is buffered for approx. 1000 hours @ 25°C by a gold foil capacitor. The gold foil capacitor is completely charged after 18 continuous hours of operation.

²⁾ Shortest cycle time that is suitable for average applications. In certain cases, it is also possible to use shorter cycle times. The limit for the setting is specified in the entry for the shortest task class cycle time.

³⁾ At an ambient temperature of 25°C.

Accessories Cage clamp terminal block

0TB6102.2110-01, 0TB5104.2110-01, 0TB5106.2110-01



Terminal block	0TB6102.2110-01	0TB5104.2110-01	0TB5106.2110-01
Number of pins	2 (female)	4	6
Type of terminal clamp	Cage clamp terminal block	Cage clamp terminal block ¹⁾	Cage clamp terminal block
Cable type		Only copper wires (no aluminum wires!)	
Distance between contacts	3.81 mm	2.5 mm	2.5 mm
Connection cross section			
AWG wire	28 to 16	26 to 20	26 to 20
Wire end sleeves with plastic covering	0.25 to 0.5 mm ²	-	-
With wire end sleeves	0.25 to 1.5 mm ²	0.25 to 0.5 mm ²	0.25 to 0.5 mm ²
Flexible	0.14 to 1.5 mm ²	0.14 to 0.5 mm ²	0.14 to 0.5 mm ²
Inflexible	0.14 to 1.5 mm ²	0.14 to 0.5 mm ²	0.14 to 0.5 mm ²
Tightening torque		-	
Electrical characteristics	0TB6102.2110-01	0TB5104.2110-01	0TB5106.2110-01
Nominal voltage	300 V	125 V	125 V
Nominal current ²⁾	8 A	4 A	4 A

¹⁾ Cage clamp terminal blocks cannot be used side-by-side.

²⁾ The limit data for each Power Panel must be taken into consideration.

Accessories Screw clamp terminal block

0TB6102.2010-01



Terminal block

Number of pins	2 (female)
Type of terminal clamp	Screw clamp terminal block
Cable type	Only copper wires (no aluminum wires!)
Distance between contacts	3.81 mm
Connection cross section	
AWG wire	28 to 16
Wire end sleeves with plastic covering	0.25 to 0.5 mm ²
With wire end sleeves	0.25 to 1.5 mm ²
Flexible	0.14 to 1.5 mm ²
Inflexible	0.14 to 1.5 mm ²
Tightening torque	0.22 to 0.25 Nm

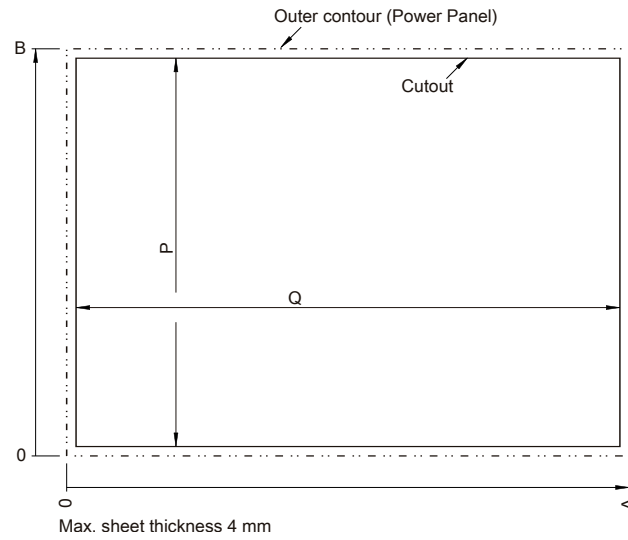
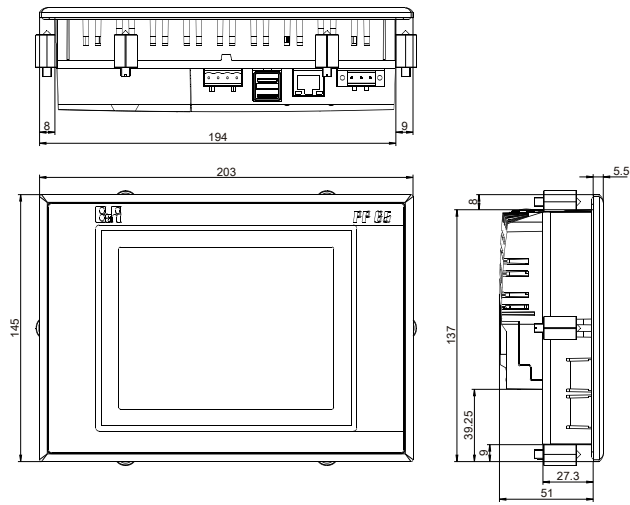
Electrical characteristics

Nominal voltage	300 V
Nominal current ¹⁾	8 A

¹⁾ The limit data for each Power Panel must be taken into consideration.

Dimensions

PP65 dimensions

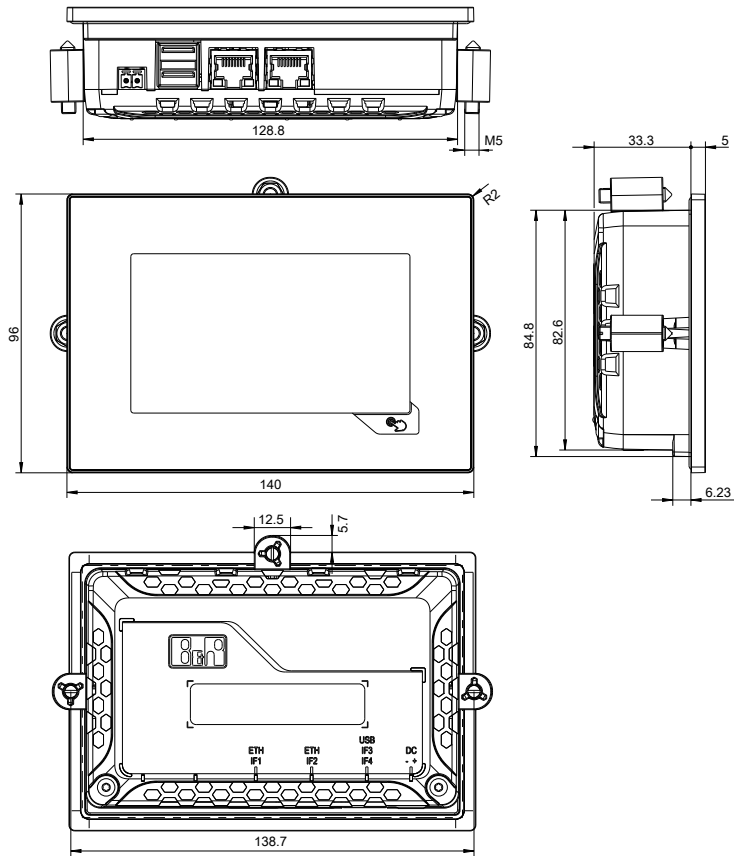




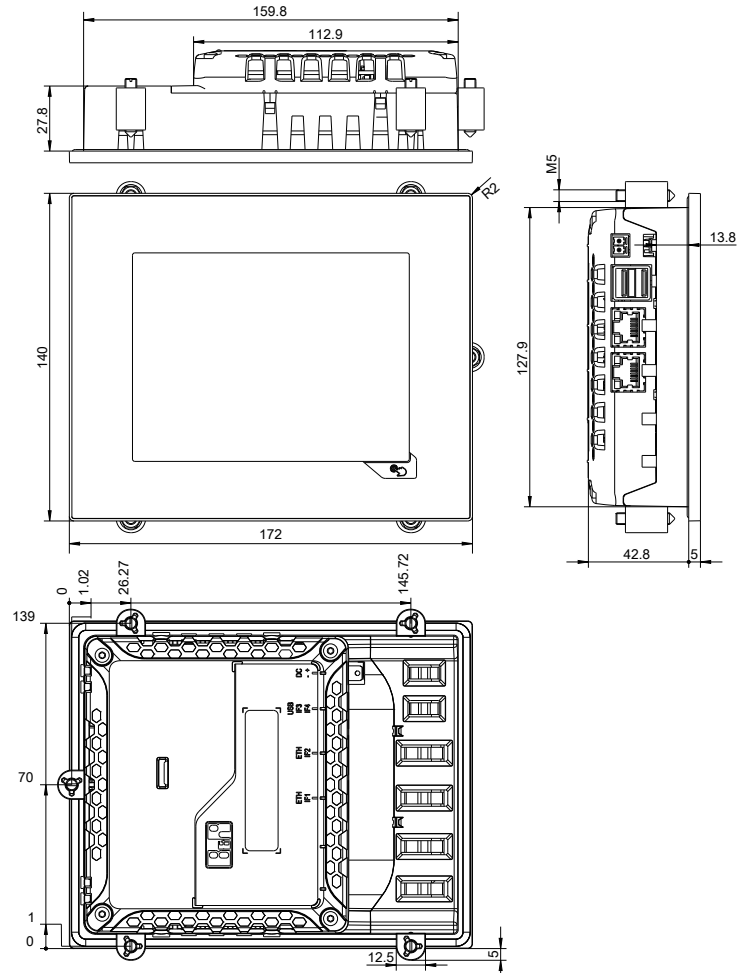
Dimensions

T-Series dimensions

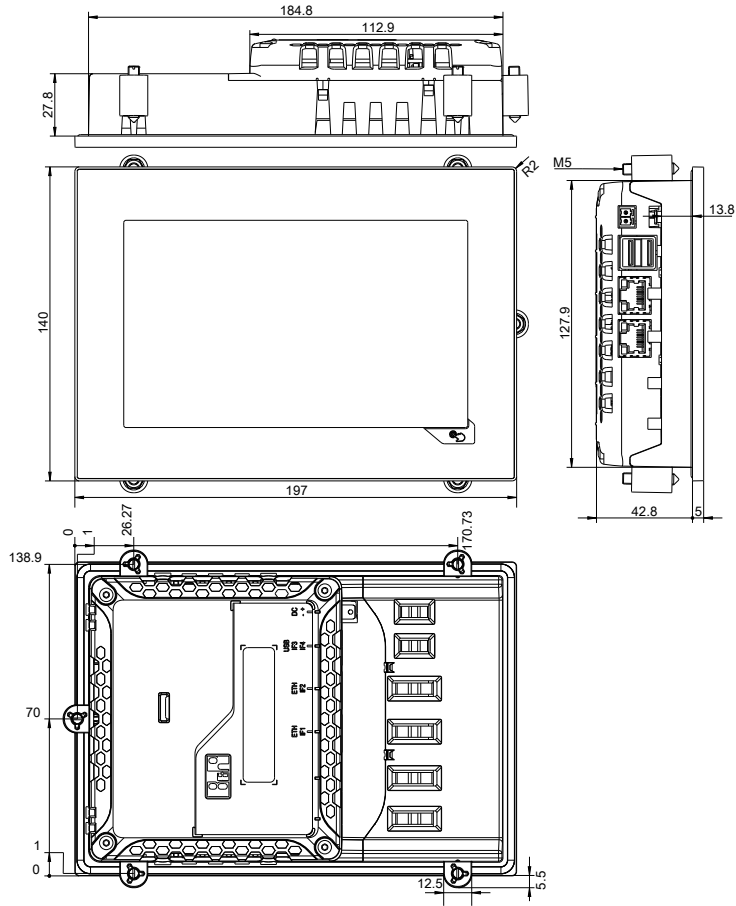
4.3" device dimensions



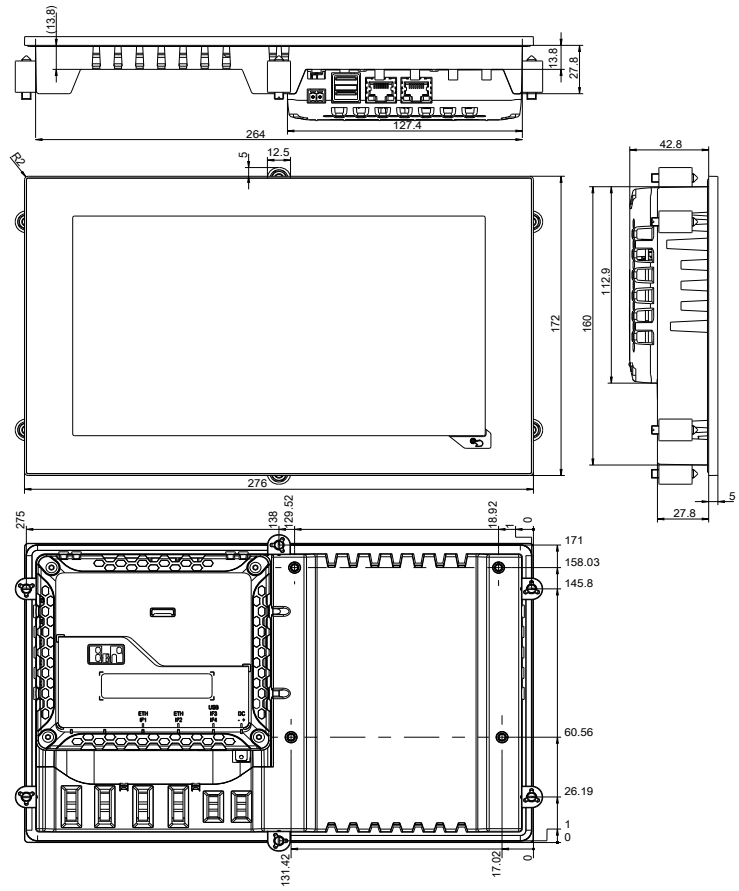
5.7" device dimensions



7" device dimensions



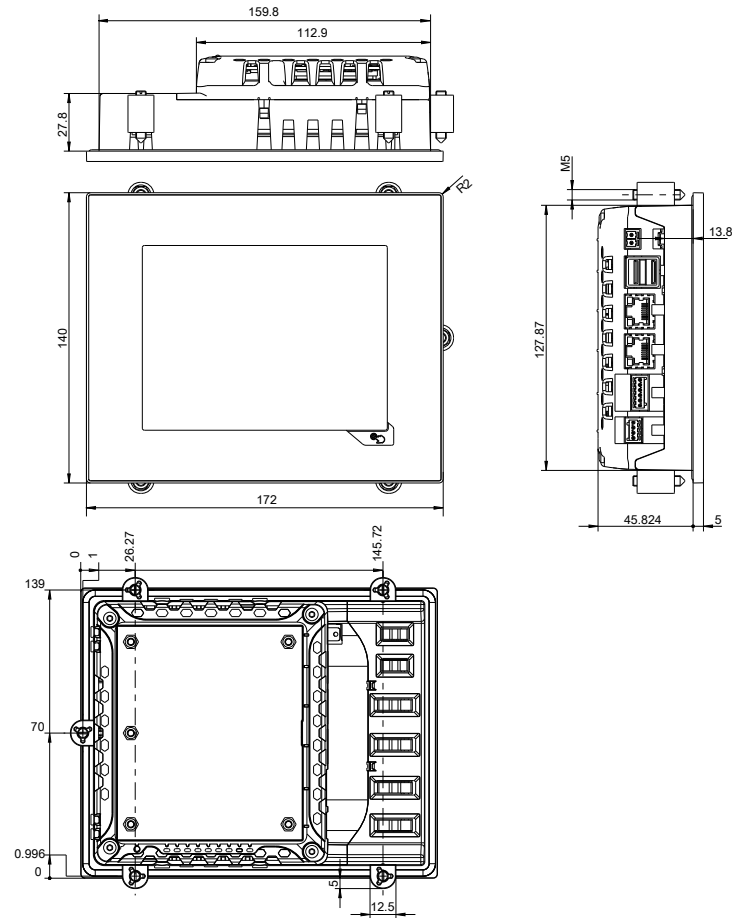
10.1" device dimensions



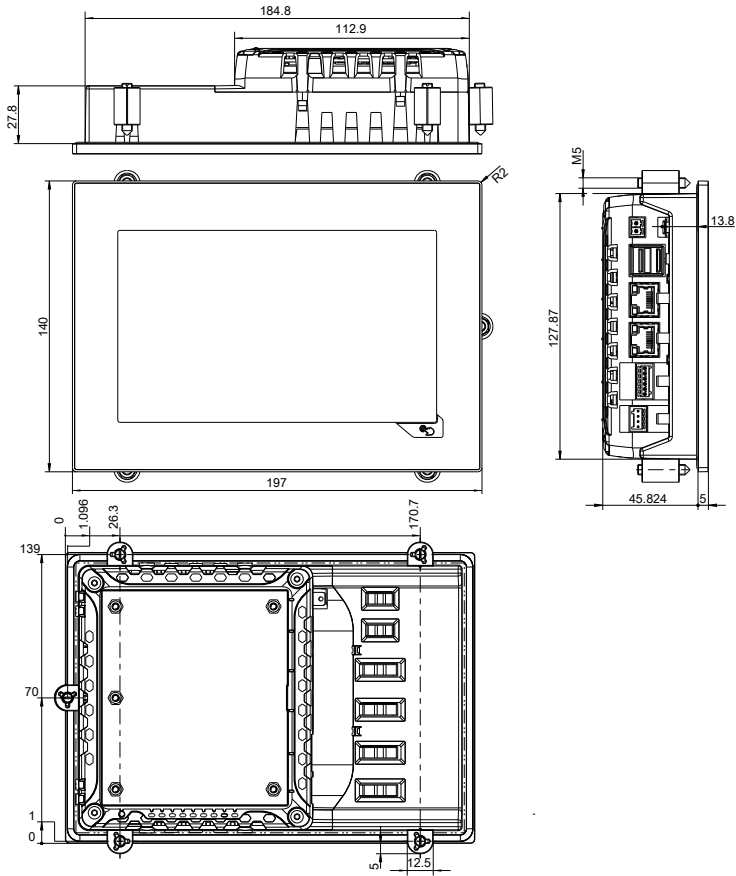
Dimensions

C-Series dimensions

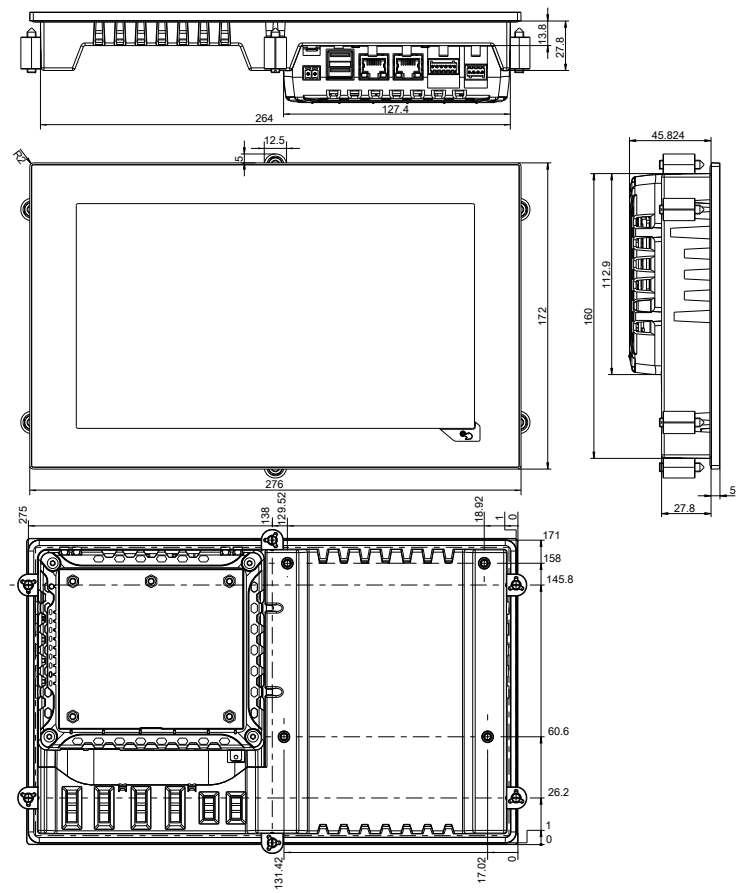
5.7" device dimensions



7" device dimensions



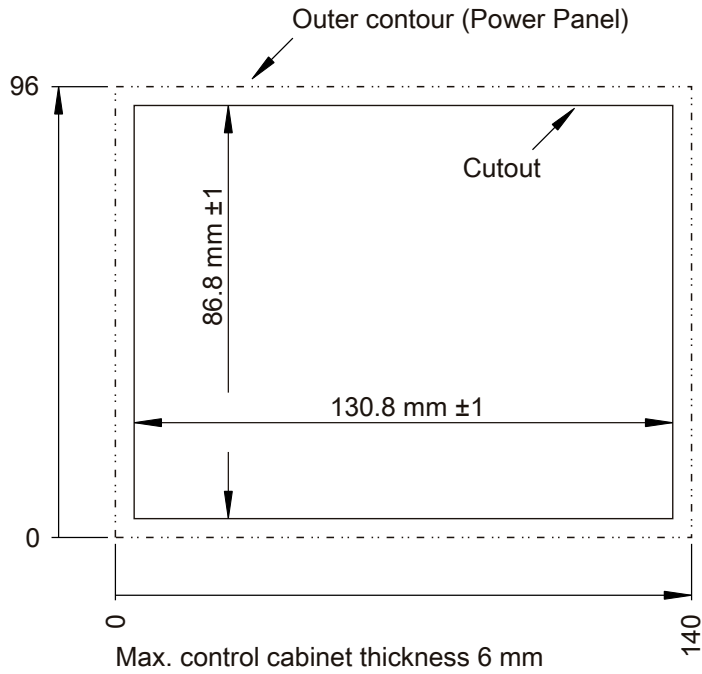
10.1" device dimensions



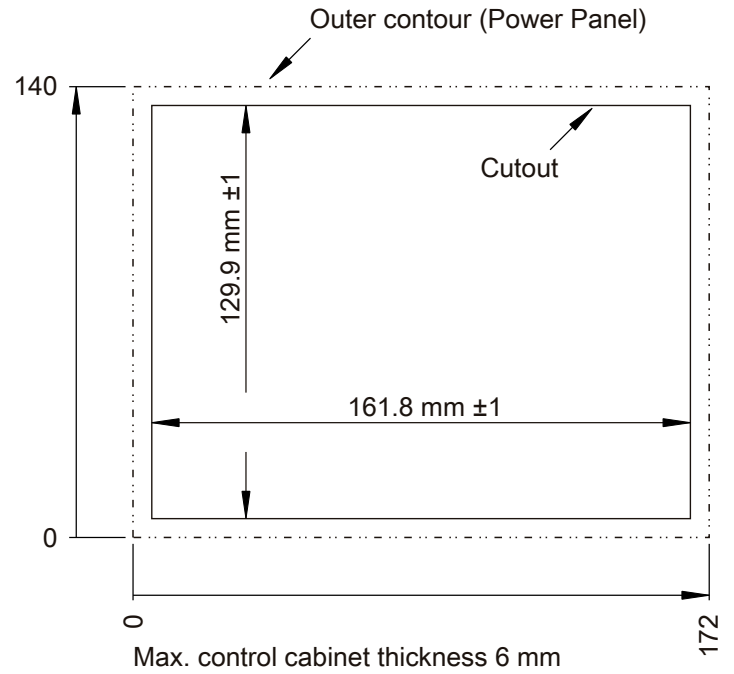
Dimensions

T-Series / C-Series cutouts

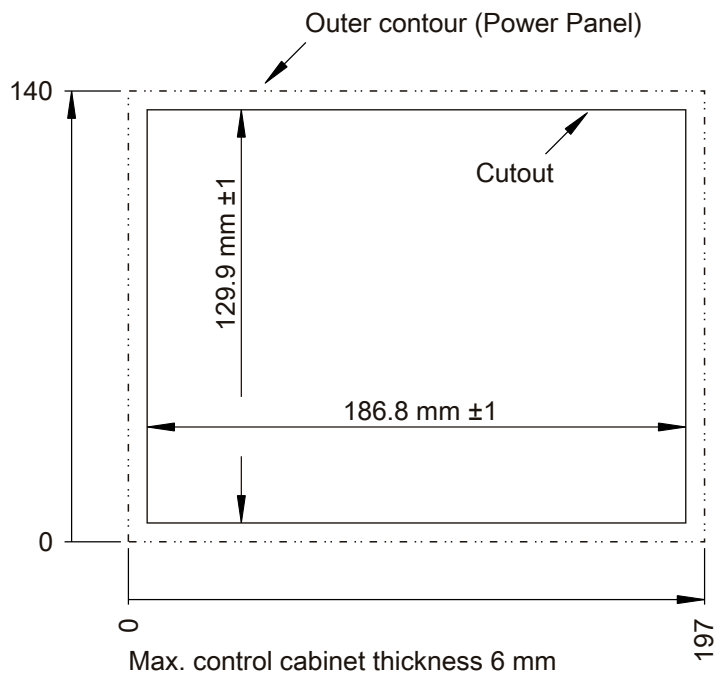
4.3" device cutouts



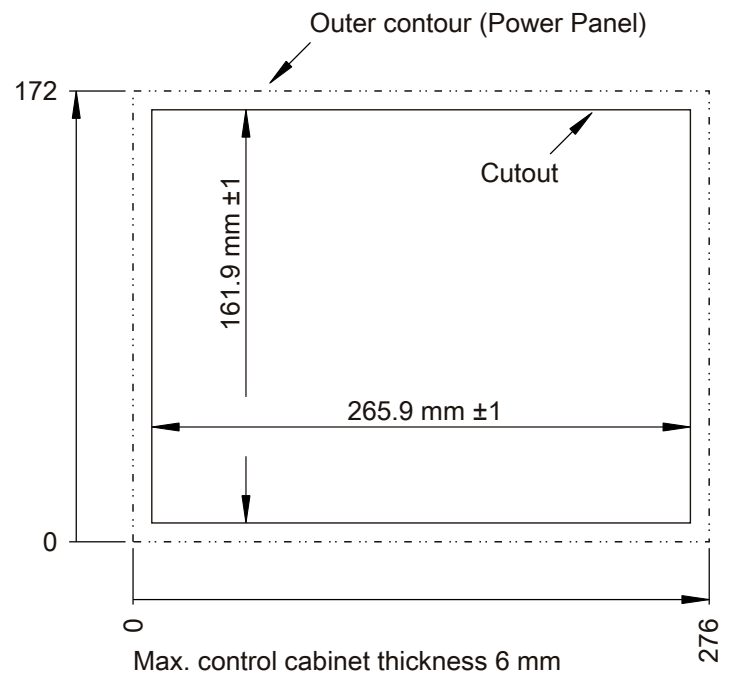
5.7" device cutouts



7.0" device cutouts



10.1" device cutouts









Automation PC 2100

Maximum performance comes in very small packages

The control cabinet variant of the Automation PC 2100 provides a full-fledged PC system with minimized dimensions.

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System features	 350
Data sheets	 351
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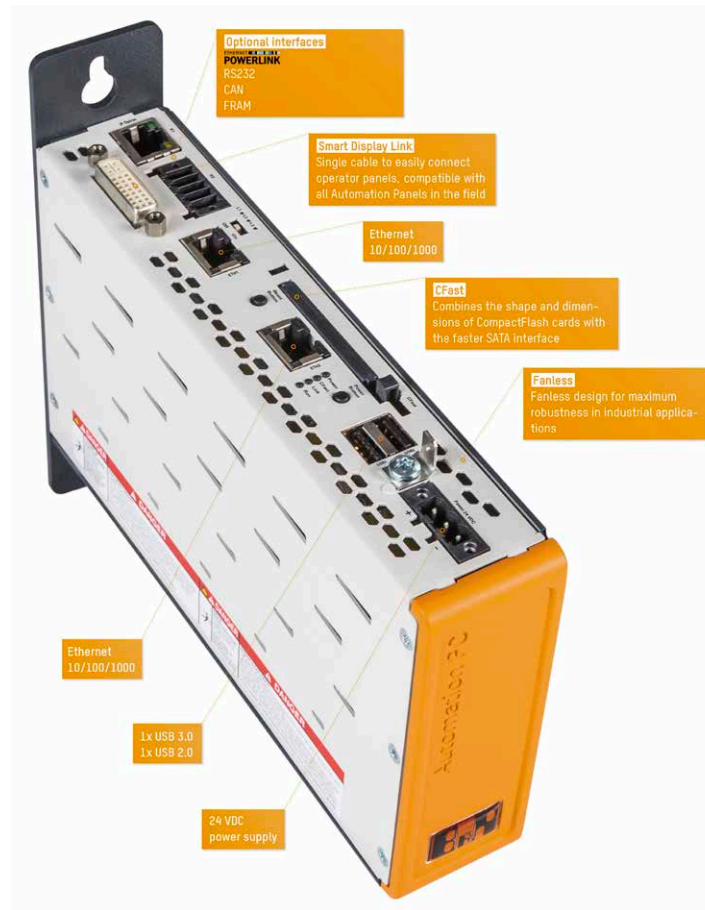
System features

Communication in all directions

The Automation PC 2100 integrates all the important interfaces, including 2x Gigabit Ethernet as well as 1x USB 2.0 and 1x USB 3.0. Interface modules can also be added to take advantage of fieldbus technology such as POWERLINK and CAN. For data storage, MLC-based CFast cards are available that can store up to 60 GB or more.

Maximum graphics performance

The graphics engine used by Intel Atom processors is derived from Core i technology and provides powerful processing. This is also the first time that support for DirectX 11 is provided in this segment, opening up even more possibilities for enhanced graphic capabilities in SCADA and other HMI systems. All resolutions and screen sizes up to 24.0" Full HD are supported.

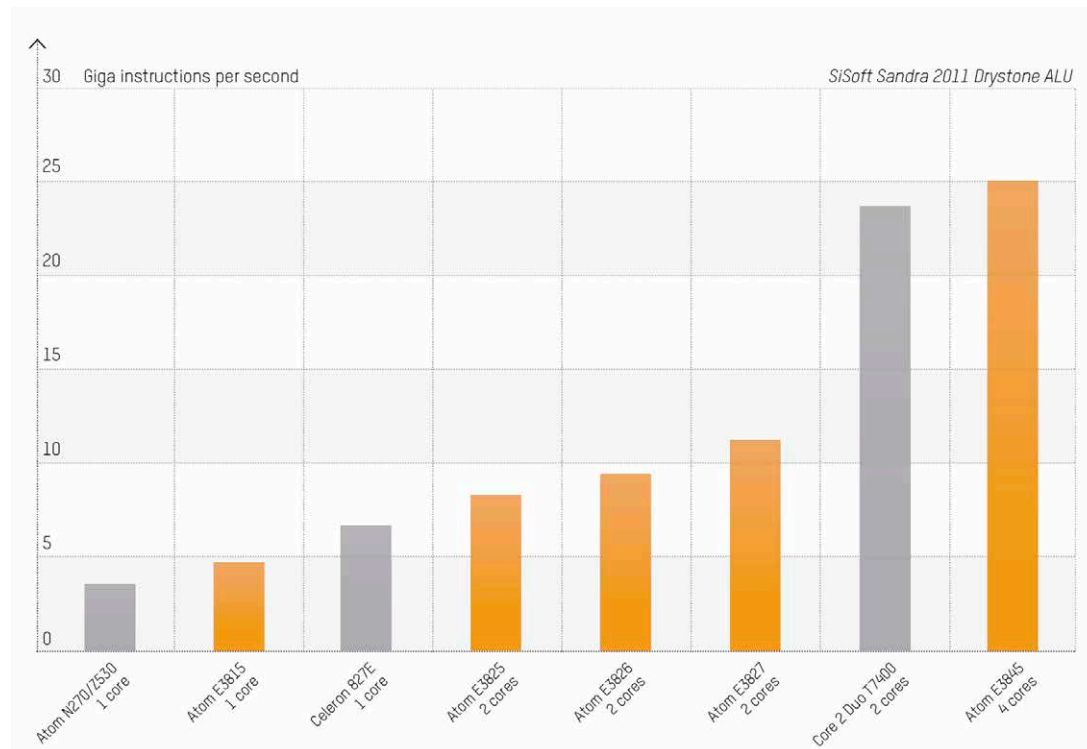


Compact performance

The available Intel Atom processors offer scaled processing power up to Core i3 performance levels. The Atom processors themselves are available in five designs, from single- and dual-core all the way to quad-core processors. This guarantees the perfect match between CPU power and any application. The integrated graphics engine also delivers performance above and beyond anything possible with Core2 Duo processors. Another supported feature is DirectX 11, which makes it possible to design even more demanding HMI software.

Fanless

The PC architecture is designed as an extremely efficient "system on a chip" (SoC) solution. Because this technology does away with additional components such as the chipset, it is able to reduce heat dissipation to a minimum and eliminate the need for extensive cooling systems. The result? Compact PC systems that can be operated with no fans whatsoever over a wide temperature range.



System units

5APC2100.BY01-000, 5APC2100.BY11-000, 5APC2100.BY22-000, 5APC2100.BY34-000, 5APC2100.BY44-000



	5APC2100. BY01-000	5APC2100. BY11-000	5APC2100. BY22-000	5APC2100. BY34-000	5APC2100. BY44-000
General information					
Cooling	Passive via housing				
LED status indicators	Power, CFast, Link, Run				
Certification					
CE	Yes				
cULus	Yes				
GL	-	-	-	-	Yes ¹⁾
Controller					
Processor					
Type	Intel Atom E3815	Intel Atom E3825	Intel Atom E3826	Intel Atom E3827	Intel Atom E3845
Clock frequency	1460 MHz	1330 MHz	1460 MHz	1750 MHz	1910 MHz
Number of cores	1	2	2	2	4
L2 cache	512 kB	1 MB	1 MB	1 MB	2 MB
Intel 64 architecture	Yes				
Chipset	Intel Bay Trail				
Graphics					
Controller	Intel HD graphics				
Memory					
Type	DDR3 SDRAM				
Memory size	1 GB	1 GB	2 GB	4 GB	4 GB
Speed	DDR3L-1067	DDR3L-1067	DDR3L-1067	DDR3L-1333	DDR3L-1333
Power management	ACPI 4.0				
Interfaces					
CFast slot					
Quantity	1				
USB					
Quantity	2				
Type	1x USB 3.0 1x USB 2.0				
Ethernet					
Quantity	2				
Transfer rate	10/100/1000 Mbit/s				
Inserts					
Interface option ²⁾	1				
Monitor/Panel option ³⁾	1				

System units

5APC2100.BY01-000, 5APC2100.BY11-000, 5APC2100.BY22-000, 5APC2100.BY34-000, 5APC2100.BY44-000

Electrical characteristics	5APC2100. BY01-000	5APC2100. BY11-000	5APC2100. BY22-000	5APC2100. BY34-000	5APC2100. BY44-000
Nominal voltage			24 VDC ±25%		
Nominal current			3 A		
Operating conditions	5APC2100. BY01-000	5APC2100. BY11-000	5APC2100. BY22-000	5APC2100. BY34-000	5APC2100. BY44-000
EN 60529 protection			IP20 ⁴⁾		
Mechanical characteristics	5APC2100. BY01-000	5APC2100. BY11-000	5APC2100. BY22-000	5APC2100. BY34-000	5APC2100. BY44-000
Dimensions ⁵⁾					
Width			40 mm		
Height			115 mm		
Depth			198 mm		
Weight			1170 g		

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

²⁾ The interface option cannot be replaced.

³⁾ The monitor/panel option cannot be replaced.

⁴⁾ Only when all interface covers are installed.

⁵⁾ All dimensions without mounting plate.

Monitor/Panel options

5ACCLI01.SDL0-000, 5ACCLI01.SDL3-000



General information	5ACCLI01.SDL0-000	5ACCLI01.SDL3-000
Certification		
CE		Yes
cULus		Yes
GL	Yes ¹⁾	-
Interfaces	5ACCLI01.SDL0-000	5ACCLI01.SDL3-000
Monitor/Panel interface		
Design	DVI-I	-
Type	SDL/DVI/RGB	-
SDL3 Out		
Design	-	Shielded RJ45
Type	-	SDL3
Environmental conditions	5ACCLI01.SDL0-000	5ACCLI01.SDL3-000
Temperature		
Operation	-20 to 55°C ²⁾	0 to 50°C ³⁾
Relative humidity		
Operation		5 to 90%, non-condensing
Mechanical characteristics	5ACCLI01.SDL0-000	5ACCLI01.SDL3-000
Weight		20 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

²⁾ Detailed information can be found in the temperature tables in the user's manual.
DVI and SDL modes are possible down to -20°C; RGB mode is only possible down to 0°C.

³⁾ Detailed information can be found in the temperature tables in the user's manual.

Interface options

5ACCIF01.FPLS-000, 5ACCIF01.FPLS-001



General information	5ACCIF01.FPLS-000	5ACCIF01.FPLS-001
LED status indicators		L2, L3
Certification		
CE		Yes
cULus		Yes
cULus HazLoc Class 1 Division 2		Yes ¹⁾
GL	Yes ²⁾	-
Controller	5ACCIF01.FPLS-000	5ACCIF01.FPLS-001
FRAM	32 kB	-
nvSRAM	-	512 kB
Interfaces	5ACCIF01.FPLS-000	5ACCIF01.FPLS-001
COM		
Quantity		1
Type		RS232, modem-capable, not electrically isolated
Design		10-pin, male
Max. baud rate		115 kbit/s
POWERLINK		
Quantity		1
Transmission		100BASE-TX
Type		Type 4 ³⁾
Design		Shielded RJ45
Transfer rate		100 Mbit/s
Cable length		Max. 100 m between two stations (segment length)
Environmental conditions	5ACCIF01.FPLS-000	5ACCIF01.FPLS-001
Temperature		
Operation		-20 to 55°C
Relative humidity		
Operation		5 to 90%, non-condensing
Mechanical characteristics	5ACCIF01.FPLS-000	5ACCIF01.FPLS-001
Weight		25 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ Yes, although applies only if all components installed within the complete system have this certification.

³⁾ More information is available in the Automation Studio help system (Communication - POWERLINK - General information - Hardware - IF / LS).

5ACCIF01.FPSC-000, 5ACCIF01.FPSC-001



General information	5ACCIF01.FPSC-000	5ACCIF01.FPSC-001
LED status indicators		L1, L2, L3
Certification		
CE		Yes
cULus		Yes
cULus HazLoc Class 1 Division 2		Yes ¹⁾
GL	Yes ²⁾	-
Controller	5ACCIF01.FPSC-000	5ACCIF01.FPSC-001
FRAM	32 kB	-
nvSRAM	-	512 kB
Interfaces	5ACCIF01.FPSC-000	5ACCIF01.FPSC-001
COM		
Quantity		1
Type		RS232, not modem-capable, not electrically isolated
Design		10-pin, male
Max. baud rate		115 kbit/s
POWERLINK		
Quantity		1
Transmission		100BASE-TX
Type		Type 4 ³⁾
Design		Shielded RJ45
Transfer rate		100 Mbit/s
Cable length		Max. 100 m between two stations (segment length)
CAN		
Quantity	1	1
Design	10-pin, male, not electrically isolated	10-pin, male, electrically isolated
Transfer rate		Max. 1 Mbit/s
Terminating resistor		
Type		Can be enabled or disabled using a sliding switch
X2X		
Quantity	-	1
Design	-	10-pin, male, electrically isolated
Environmental conditions	5ACCIF01.FPSC-000	5ACCIF01.FPSC-001
Temperature		
Operation		-20 to 55°C
Relative humidity		
Operation		5 to 90%, non-condensing
Mechanical characteristics	5ACCIF01.FPSC-000	5ACCIF01.FPSC-001
Weight		25 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ Yes, although applies only if all components installed within the complete system have this certification.

³⁾ More information is available in the Automation Studio help system (Communication - POWERLINK - General information - Hardware - IF / LS).

Interface options

5ACCIF01.FPLK-000, 5ACCIF01.FPCC-000, 5ACCIF01.ICAN-000



General information	5ACCIF01.FPLK-000	5ACCIF01.FPCC-000	5ACCIF01.ICAN-000
LED status indicators	L1, L2, L3	L1, L2, L3	L1
Certification			
CE		Yes	
cULus		Yes	
Controller	5ACCIF01.FPLK-000	5ACCIF01.FPCC-000	5ACCIF01.ICAN-000
nvSRAM	512 kB	512 kB	-
Interfaces	5ACCIF01.FPLK-000	5ACCIF01.FPCC-000	5ACCIF01.ICAN-000
POWERLINK			
Quantity	2	1	-
Transmission	100BASE-TX	100BASE-TX	-
Type	Type 4 ¹⁾	Type 4 ¹⁾	-
Design	Shielded RJ45	Shielded RJ45	-
Transfer rate	100 Mbit/s	100 Mbit/s	-
Cable length	Max. 100 m between two stations (segment length)	Max. 100 m between two stations (segment length)	-
CAN			
Quantity	-	2	1
Design	-	10-pin, male ²⁾	10-pin, male, electrically isolated
Transfer rate	-	Max. 1 Mbit/s	Max. 1 Mbit/s
Terminating resistor			
Type	-	Can be enabled or disabled using a sliding switch ³⁾	Can be enabled or disabled using a sliding switch
X2X			
Quantity	-	1	-
Design	-	10-pin, male, electrically isolated	-
Environmental conditions	5ACCIF01.FPLK-000	5ACCIF01.FPCC-000	5ACCIF01.ICAN-000
Temperature			
Operation		-20 to 55°C	
Relative humidity			
Operation		5 to 90%, non-condensing	
Mechanical characteristics	5ACCIF01.FPLK-000	5ACCIF01.FPCC-000	5ACCIF01.ICAN-000
Weight		25 g	

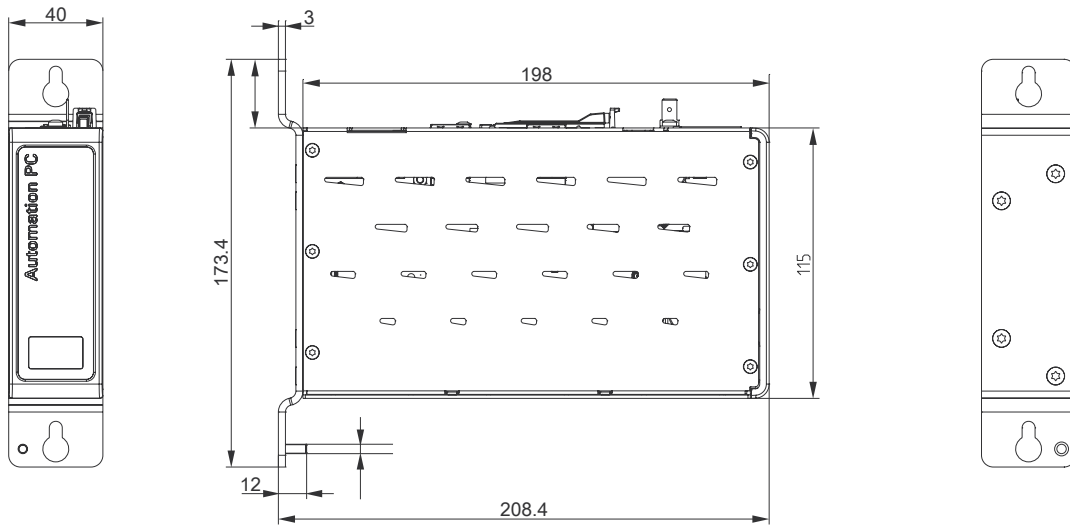
¹⁾ More information is available in the Automation Studio help system (Communication - POWERLINK - General information - Hardware - IF / LS).

²⁾ CAN1: Electrically isolated
CAN2: Not electrically isolated

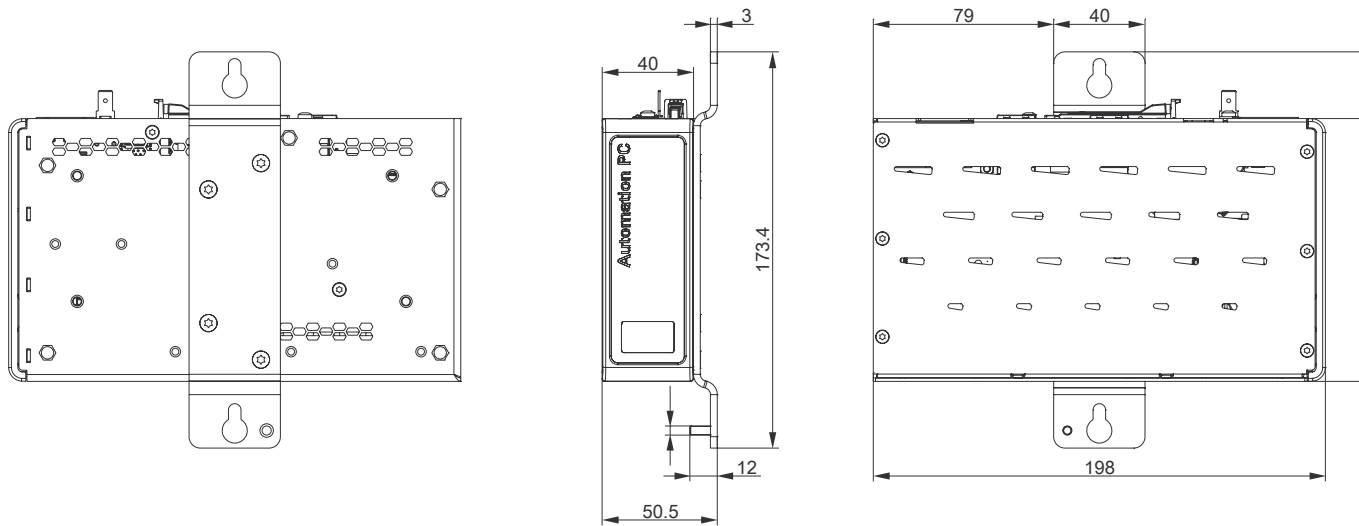
³⁾ The terminating resistor can only be enabled/disabled for the CAN1 interface.

Dimensions

Mounting plate on back (book style)



Mounting plate on right side (box style)



All dimensions are specified in mm.






Automation PC 910

In the fast lane with the Automation PC 910

The Automation PC 910 offers maximum computing power for the most complex tasks, such as sophisticated machine vision systems. It is based on the latest generation of Core i-series processors – the benchmark for top-performing PC architectures.

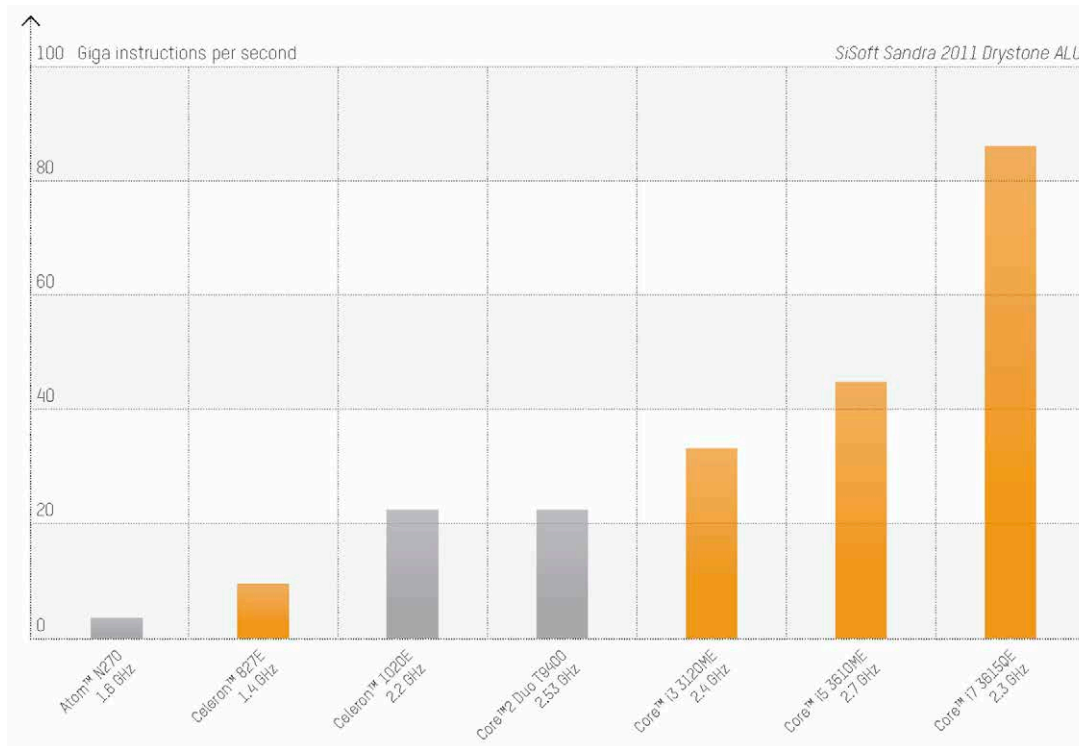
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System features

In the fast lane with the Automation PC 910

Intel has reduced the size of the chip to an impressive 22 nanometers. A new microarchitecture with the graphics unit integrated directly in the CPU provides a considerable leap in performance over the second generation of Core i processors, not to mention compared to Core 2 Duo processors. Core i3, Core i5 and Core i7 CPUs with up to four cores represent the maximum performance currently available on the industrial PC market – all while keeping power consumption to a minimum.



Maximum reliability

Automation PCs are designed and built for continuous operation in harsh industrial environments over a period of many years. They are encased in a robust welded housing that shields the electronics from the external environment and easily endures even the roughest handling. A heavy-duty industrial coating protects the housing against aggressive conditions and keeps the Automation PC 910 looking new, even after years of use. Circuit boards are connected using screw-in connectors, with extra resistance to vibration and shock provided by the elimination of all internal cable connections.

All components have been selected with maximum reliability in mind. These components have been designed specifically for use in industrial environments, can withstand high ambient temperatures and enjoy long-term availability.

High-performance

The rest of the PC infrastructure has also been streamlined for maximum computing performance and optimal data throughput. For example, the Automation PC 910 features a serial ATA-based CFAST card instead of the previously used CompactFlash. CFAST cards combine the form factor of a CompactFlash card with the faster SATA interface. At the same time, CFAST cards retain all the advantages of CompactFlash, such as its extreme robustness.

Multi-core

Since the introduction of the Core Duo processors, the multi-core approach has been the foundation for continued development of CPU technology. Once single-core processors reached their physical limits, it was no longer possible to increase performance without considerably increasing power consumption. Multi-core technology resolved this conflict of interest, allowing greater performance to come hand-in-hand with more efficient energy use. The 3rd generation Core i-series equipped in Automation PC 910 systems includes a rich selection of high-performance dual-core and quad-core processors. This includes several low-power versions that allow the Automation PC 910 to be operated without fans, even with a Core i7.



Fanless operation that meets the highest demands

Many variants of the Automation PC 910 provide the option of operation without the use of fans. When this feature is combined with CFast cards and solid-state drives, the PC system is completely free of rotating parts – a huge advantage when it comes to maintenance-free operation. The Automation PC 910 cooling system has been completely revamped for optimal heat transfer out of the housing. To maximize convection for fanless operation, the Automation PC 910 heat sink design was optimized through an extensive evaluation process using simulated models.

On high-end systems with fans, air current is directed through the integrated cooling fins. As processors shrink in size, heat is generated on a smaller and smaller surface area. To deal with this, heat pipes are the best way to provide maximum heat dissipation.

Your bonus package

PCs from B&R are designed and built to meet industrial customers' demands for maximum robustness, reliability and long-term availability. Decision-makers in a wide range of industries select B&R industrial PCs because they know that PCs that may appear cheap at first glance are the most expensive in the long run. After all, it's the total cost over a product's life cycle that matters, and that's where the cost advantages of B&R industrial PCs really shine.



Customized

The Automation PC 910 can be adapted perfectly to each application's unique requirements. This starts by selecting the necessary processor performance and housing size and then scaling everything else – memory capacity and storage media such as CFast, HDD or SSD, for example – as needed.

Powerful

The Automation PC 910 is a true powerhouse. Equipped with state-of-the-art technology like 3rd generation Intel Core i-series processors, the Automation PC 910 is the ideal choice for demanding applications, including those involving complex HMI applications. USB 3.0 interfaces provide the optimal connection for integrating machine vision systems. And there are the obvious cost advantages of replacing several weaker PCs with a single high-performance unit.

Energy efficient

Another advantage of 3rd generation Intel Core i-series technology is that it manages to significantly increase performance while lowering power consumption – delivering maximized energy efficiency and virtually eliminating the need for internal fans. With the reduced power dissipation of the Automation PC 910, applications that require the use of several industrial PCs in particular will benefit greatly from the improved energy usage.

Robust

The robust design of the Automation PC 910 is perfectly suited for continuous operation in the harshest environments. It has no internal cable connections and comes in many variations with no rotating parts at all.

Reliable

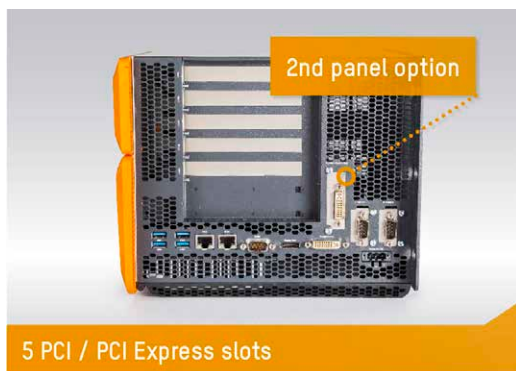
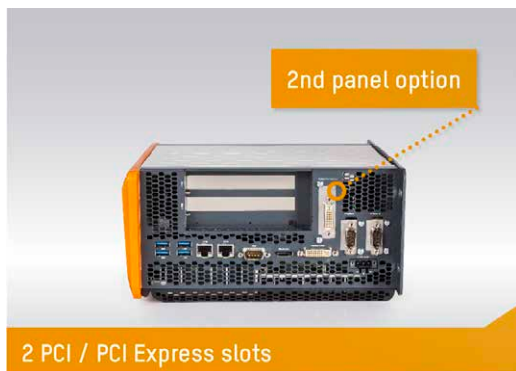
Each PC undergoes comprehensive function testing prior to shipping. All system properties, components and interfaces are fully inspected. After years of reliable operation, your bottom line will notice the difference.

Ready to use

These industrial PCs are delivered completely ready to use. OEM machine manufacturers can have the Automation PC sent directly to their control cabinet supplier with all software fully installed. Upon request, B&R can freeze versions of BIOS and firmware for guaranteed long-term consistency – a huge advantage for individually certified machines and systems.

Long-term availability

The Automation PC 910 will be available for many years to come. Once the PC has been integrated into a machine, maintenance is complete for the machine manufacturer. The machine enters series production and can continue to be manufactured for over a decade.



System features



Optimized air circulation

The new honeycomb openings on the housing panels provide the perfect combination of air circulation and structural rigidity.

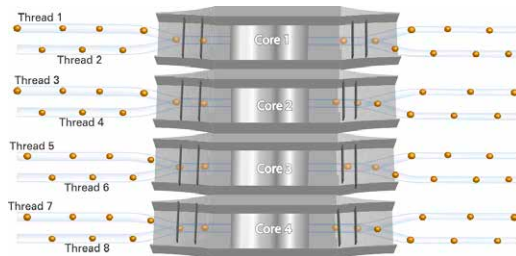
Celeron processors and select Core i-series processors are able to operate without fans. Yet even without fans, the Automation PC 910 is able to achieve performance results that previous PC generations required fans to achieve. In the high-end range, quad-core CPUs can be used with fan cooling to achieve performance values that not too long ago would have been inconceivable for such a compact form factor.

Intel technology inside

The latest generation Core i-series features a multi-core microarchitecture with integrated graphics. In addition to graphics, the processors contain the cores, memory controller and cache memory. The memory controller supports DDR3 RAM, with a clock rate that has increased to 1600 MHz to provide faster data exchange between the processor and the DRAM.

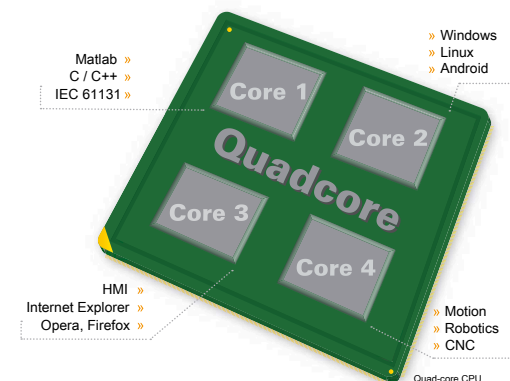
Hyper-threading

Hyper-Threading Technology from Intel enables each core to process two tasks simultaneously. This optimizes processor utilization and boosts the performance of the system as a whole. When running resource-intensive applications, this also ensures that there is plenty of computing power left over for programs running concurrently.



Turbo Boost

When the situation calls for it, the processor automatically shifts into high gear with Intel's Turbo Boost Technology. This dynamically increases the processor frequency beyond the base operating frequency when the workload demands additional performance. CPU power can therefore be increased temporarily when necessary.



Hypervisor and virtualization

Hypervisor technology allows multiple operating systems to run on a single multi-core processor. It's even possible to combine standard operating systems such as Windows and Linux with real-time operating systems. The hypervisor is a layer of software separating the PC hardware from the operating systems; this software runs concurrently yet independently.



2 modular interfaces
 ETHERNET
POWERLINK
 RS232/422/485
 CAN/UPS/Audio/SRAM

Fanless
 Same base device can be
 operated with or without a fan
 – maximum flexibility for all users

HDD & SSD
 More than enough storage space
 with hard disk and solid-state
 drives

CFast
 Combines the shape and dimen-
 sions of CompactFlash cards with
 the faster SATA interface

Up to 5 PCI /
 PCI Express slots

SDL/DVI/Monitor

DisplayPort

RS232

2x Ethernet
 10/100/1000

4x USB 3.0

Smart Display Link
 Single cable to easily connect
 operator panels, compatible with
 all Automation Panels in the field

Automation PC

System units

5PC910.SX01-00, 5PC910.SX02-00, 5PC910.SX05-00



General information	5PC910.SX01-00	5PC910.SX02-00	5PC910.SX05-00
Cooling		Passive via heat sink and optionally supported with an active fan kit	
LED status indicators		Power, HDD, Link, Run	
Battery			
Service life		4 years ¹⁾	
Design		Lithium ion	
Certification			
CE		Yes	
cULus		Yes	
GOST-R		Yes	
GL	Yes ²⁾	Yes ²⁾	-
Controller	5PC910.SX01-00	5PC910.SX02-00	5PC910.SX05-00
Graphics		Depends on the CPU board being used	
Memory			
Type		SO-DIMM DDR3 SDRAM	
Memory size		Max. 16 GB	
Interfaces	5PC910.SX01-00	5PC910.SX02-00	5PC910.SX05-00
COM1			
Type		RS232, modem-capable, not electrically isolated	
Design		9-pin, male, DSUB connector	
Max. baud rate		115 kbit/s	
CFast slot			
Quantity		1	
USB			
Quantity		5	
Type		4x USB 3.0 (top) 1x USB 2.0 (front)	
Ethernet			
Quantity		2	
Transfer rate		10/100/1000 Mbit/s	
DisplayPort			
Quantity		1	
Version		1.1	
Monitor/Panel interface			
Design		DVI-I	
Type		SDL/DVI/Monitor	
Inserts	5PC910.SX01-00	5PC910.SX02-00	5PC910.SX05-00
PCI/PCIe slots			
Quantity	1 PCI slot or 1 PCIe slot ³⁾	2 PCI slots or 1 PCI slot and 1 PCIe slot or 2 PCIe slots ⁴⁾	5 PCI slots or 4 PCI slots and 1 PCIe slot or 2 PCI slots and 3 PCIe slots or 5 PCIe slots ⁵⁾

5PC910.SX01-00, 5PC910.SX02-00, 5PC910.SX05-00

Slide-in drives				
Quantity	-	1		2
Slide-in compact drives				
Quantity	1	1		1
Interface option	2	2		2
Monitor/Panel option	No	1		1
Add-on UPS slot			Yes ⁶⁾	
Insert for fan kit			Yes	
Electrical characteristics	5PC910.SX01-00	5PC910.SX02-00		5PC910.SX05-00
Nominal voltage			24 VDC ±25%	
Nominal current			Max. 5.5 A ⁷⁾	
Operating conditions	5PC910.SX01-00	5PC910.SX02-00		5PC910.SX05-00
EN 60529 protection			IP20 ⁸⁾	
Environmental conditions	5PC910.SX01-00	5PC910.SX02-00		5PC910.SX05-00
Temperature				
Operation			Component-dependent ⁹⁾	
Relative humidity				
Operation			Component-dependent	
Mechanical characteristics	5PC910.SX01-00	5PC910.SX02-00		5PC910.SX05-00
Housing ¹⁰⁾				
Material			Galvanized plate, plastic	
Dimensions				
Width	91 mm	130 mm		211 mm
Height			270 mm	
Depth			254.75 mm	
Weight	2050 g	2550 g		2850 g

¹⁾ At 50°C, 8.5 µA of the supplied components and a self-discharge of 40%. If an interface option with SRAM or POWERLINK has been installed, the service life is 2½ years.

²⁾ Yes, although applies only if all components installed within the complete system have this certification.

³⁾ The PCI and PCIe slots available depend on the 5AC901.BX01-00 and 5AC901.BX01-01 bus unit being used.

⁴⁾ The PCI and PCIe slots available depend on the bus unit being used (5AC901.BX02-00, 5AC901.BX02-01 or 5AC901.BX02-02).

⁵⁾ The PCI and PCIe slots available depend on the bus unit being used (5AC901.BX05-00, 5AC901.BX05-01, 5AC901.BX05-02 or 5AC901.BX05-03).

⁶⁾ This UPS module can only be operated in the IF option 1 slot.

⁷⁾ Maximum current consumption (24 V / 130 W). This can vary depending on the configuration (see "Power calculation" section). The starting current must also be taken into consideration when selecting the power supply.

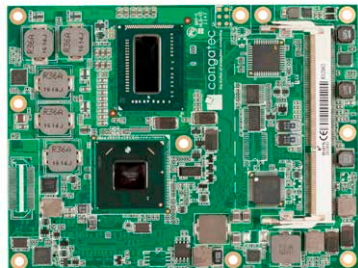
⁸⁾ Only when all interface covers and the front cover are closed.

⁹⁾ Detailed information can be found in the temperature tables in the user's manual.

¹⁰⁾ There may be visible deviations in the color and surface appearance depending on the process or batch.

CPU boards

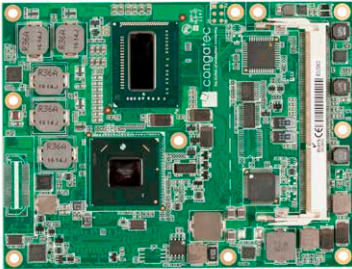
5PC900.TS77-00, 5PC900.TS77-01, 5PC900.TS77-02, 5PC900.TS77-03, 5PC900.TS77-04



General information	5PC900.TS77-00	5PC900.TS77-01	5PC900.TS77-02	5PC900.TS77-03	5PC900.TS77-04
Certification					
CE			Yes		
cULus			Yes		
GOST-R			Yes		
GL	Yes ¹⁾	-	-	-	Yes ¹⁾
Controller					
5PC900.TS77-00 5PC900.TS77-01 5PC900.TS77-02 5PC900.TS77-03 5PC900.TS77-04					
Processor					
Type	Intel Core i7-3615QE	Intel Core i7-3612QE	Intel Core i7-3555LE	Intel Core i7-3517UE	Intel Core i5-3610ME
Clock frequency	2300 MHz	2100 MHz	2500 MHz	1700 MHz	2700 MHz
Number of cores	4	4	2	2	2
Intel Smart Cache	6 MB	6 MB	4 MB	4 MB	3 MB
Intel 64 architecture			Yes		
Chipset	Intel QM77				
Memory slot					
Number of memory channels	2				
Type	DDR3				
Memory size	Max. 16 GB				
Graphics					
Controller	Intel HD Graphics 4000				
Resolution	Resolution up to 1920 x 1200 (WUXGA)				
DVI	350 MHz RAMDAC, resolution up to 2048 x 1536 @ 75 Hz (QXGA)				
RGB					
DisplayPort	Version 1.1				
Power management	ACPI 4.0 with battery support				

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

5PC900.TS77-05, 5PC900.TS77-06, 5PC900.TS77-07, 5PC900.TS77-08, 5PC900.TS77-09, 5PC900.TS77-10

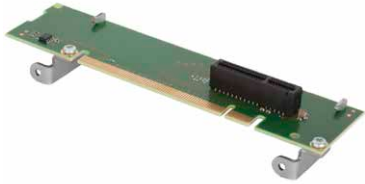


General information	5PC900. TS77-05	5PC900. TS77-06	5PC900. TS77-07	5PC900. TS77-08	5PC900. TS77-09	5PC900. TS77-10
Certification						
CE				Yes		
cULus				Yes		
GOST-R				Yes		
GL	-	-	-	-	-	Yes ¹⁾
Controller						
Processor						
Type	Intel Core i3-3120ME	Intel Core i3-3217UE	Intel Celeron 847E	Intel Celeron 827E	Intel Celeron 1020E	Intel Celeron 1047UE
Clock frequency	2400 MHz	1600 MHz	1100 MHz	1400 MHz	2200 MHz	1400 MHz
Number of cores	2	2	2	1	2	2
Intel Smart Cache	3 MB	3 MB	2 MB	1.5 MB	2 MB	2 MB
Intel 64 architecture				Yes		
Chipset	Intel QM77	Intel QM77	Intel HM76	Intel HM76	Intel HM76	Intel HM76
Memory slot						
Number of memory channels				2		
Type				DDR3		
Memory size				Max. 16 GB		
Graphics						
Controller	Intel HD Graphics 4000	Intel HD Graphics 4000	Intel HD Graphics 2000	Intel HD Graphics 2000	Intel HD Graphics 2500	Intel HD Graphics 2500
Resolution			Resolution up to 1920 x 1200 (WUXGA)			
DVI			350 MHz RAMDAC, resolution up to 2048 x 1536 @ 75 Hz (QXGA)			
RGB						
DisplayPort			Version 1.1			
Power management			ACPI 4.0 with battery support			

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

Bus units

5AC901.BX01-00, 5AC901.BX01-01



General information	5AC901.BX01-00	5AC901.BX01-01
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
GL		Yes ¹⁾
Inserts	5AC901.BX01-00	5AC901.BX01-01
PCI slots		
Quantity	1	-
Type	32-bit	-
Design	PCI half-size	-
Bus speed	33 MHz	-
PCIe slots		
Quantity	-	1
Design	-	PCIe half-size
Bus speed	-	x8 (4 GB/s)

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

5AC901.BX02-00, 5AC901.BX02-01, 5AC901.BX02-02



General information	5AC901.BX02-00	5AC901.BX02-01	5AC901.BX02-02
Certification			
CE		Yes	
cULus		Yes	
GOST-R		Yes	
GL		Yes ¹⁾	
Inserts	5AC901.BX02-00	5AC901.BX02-01	5AC901.BX02-02
PCI slots			
Quantity	2	1	-
Type	32-bit	32-bit	-
Design	PCI half-size	PCI half-size	-
Bus speed	33 MHz	33 MHz	-
PCIe slots			
Quantity	-	1	2
Design	-	PCIe half-size	PCIe half-size
Bus speed	-	x8 (4 GB/s)	x4 (2 GB/s) (2x)

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

5AC901.BX05-00, 5AC901.BX05-01, 5AC901.BX05-02, 5AC901.BX05-03



General information	5AC901.BX05-00	5AC901.BX05-01	5AC901.BX05-02	5AC901.BX05-03
Certification				
CE			Yes	
cULus			Yes	
GOST-R			Yes	
Inserts	5AC901.BX05-00	5AC901.BX05-01	5AC901.BX05-02	5AC901.BX05-03
PCI slots				
Quantity	5	4	2	-
Type	32-bit	32-bit	32-bit	-
Design	PCI half-size	PCI half-size	PCI half-size	-
Bus speed	33 MHz	33 MHz	33 MHz	-
PCIe slots				
Quantity	-	1	3	5
Design	-	PCIe half-size	PCIe half-size	PCIe half-size
Bus speed	-	x8 (4 GB/s)	x8 (4 GB/s) (1x); x1 (500 MB/s) (2x)	x4 (2 GB/s) (2x); x1 (500 MB/s) (3x)

Interface options

5AC901.I485-00, 5AC901.ICAN-00, 5AC901.IHDA-00



General information	5AC901.I485-00	5AC901.ICAN-00	5AC901.IHDA-00
Certification			
CE		Yes	
cULus		Yes	
cULus HazLoc Class 1 Division 2		Yes ¹⁾	
GOST-R		Yes	
GL		Yes ²⁾	
Interfaces	5AC901.I485-00	5AC901.ICAN-00	5AC901.IHDA-00
COM			
Type	RS232/RS422/RS485, electrically isolated	-	-
Design	9-pin, male, DSUB connector	-	-
Max. baud rate	115 kbit/s	-	-
CAN			
Quantity	-	1	-
Design	-	9-pin, male, DSUB connector	-
Transfer rate	-	Max. 1 Mbit/s	-
Audio			
Type	-	-	HDA sound
Terminating resistor	Yes	Yes	-
Environmental conditions	5AC901.I485-00	5AC901.ICAN-00	5AC901.IHDA-00
Temperature			
Operation		0 to 55°C ³⁾	
Relative humidity			
Operation		5 to 90%, non-condensing	
Mechanical characteristics	5AC901.I485-00	5AC901.ICAN-00	5AC901.IHDA-00
Weight	Approx. 34 g	Approx. 33 g	Approx. 21 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ Yes, although applies only if all components installed within the complete system have this certification.

³⁾ Detailed information can be found in the temperature tables in the user's manual.

5AC901.ISRM-00, 5AC901.IPLK-00, 5AC901.IRDY-00



General information	5AC901.ISRM-00	5AC901.IPLK-00	5AC901.IRDY-00
Ready relay	-	-	Normally open contact and normally closed contact, max. 30 VDC, max. 2 A
Certification			
CE		Yes	
cULus		Yes	
cULus HazLoc Class 1 Division 2	Yes ¹⁾	Yes ¹⁾	-
GOST-R	Yes	-	-
Controller	5AC901.ISRM-00	5AC901.IPLK-00	5AC901.IRDY-00
SRAM			
Size	2 MB	2 MB	-
Remanent variables in power failure mode	256 kB (e.g. for Automation Runtime, see the AS help system)	256 kB (e.g. for Automation Runtime, see the AS help system)	-
Interfaces	5AC901.ISRM-00	5AC901.IPLK-00	5AC901.IRDY-00
POWERLINK			
Quantity	-	1	-
Transmission	-	100BASE-TX	-
Type	-	Type 4 ²⁾	-
Design	-	Shielded RJ45	-
Transfer rate	-	100 Mbit/s	-
Cable length	-	Max. 100 m between two stations (segment length)	-
Environmental conditions	5AC901.ISRM-00	5AC901.IPLK-00	5AC901.IRDY-00
Temperature			
Operation		0 to 55°C ³⁾	
Relative humidity			
Operation		5 to 90%, non-condensing	
Mechanical characteristics	5AC901.ISRM-00	5AC901.IPLK-00	5AC901.IRDY-00
Weight	Approx. 20 g	Approx. 35 g	Approx. 30 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ More information is available in the Automation Studio help system (Communication - POWERLINK - General information - Hardware - IF / LS).

³⁾ Detailed information can be found in the temperature tables in the user's manual.

Monitor/Panel options

5AC901.LDPO-00, 5AC901.LSDL-00, 5AC901.LSD3-00



General information	5AC901.LDPO-00	5AC901.LSDL-00	5AC901.LSD3-00
LED status indicators	-	-	Status, Link
Certification			
CE		Yes	
cULus		Yes	
GOST-R	Yes	Yes	-
GL	-	Yes ¹⁾	-
Interfaces	5AC901.LDPO-00	5AC901.LSDL-00	5AC901.LSD3-00
USB			
Quantity	1	-	-
Type	USB 2.0	-	-
DisplayPort			
Quantity	1	-	-
Version	1.1	-	-
Monitor/Panel interface			
Design	-	DVI-D	-
Type	-	SDL/DVI	-
SDL3 Out			
Design	-	-	Shielded RJ45
Type	-	-	SDL3
Environmental conditions	5AC901.LDPO-00	5AC901.LSDL-00	5AC901.LSD3-00
Temperature			
Operation		0 to 55°C ²⁾	
Relative humidity			
Operation		5 to 90%, non-condensing	
Mechanical characteristics	5AC901.LDPO-00	5AC901.LSDL-00	5AC901.LSD3-00
Weight	Approx. 26 g	Approx. 45 g	Approx. 47 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

²⁾ Detailed information can be found in the temperature tables in the user's manual.

Uninterruptible power supplies

5AC901.IUPS-00, 5AC901.IUPS-01



General information	5AC901.IUPS-00	5AC901.IUPS-01
Certification		
CE		Yes
cULus		Yes
cULus HazLoc Class 1 Division 2		Yes ¹⁾
GOST-R		Yes
Electrical characteristics	5AC901.IUPS-00	5AC901.IUPS-01
Deep discharge protection		Yes
Short circuit protection		Yes ²⁾
Battery charging data		
Charging current	Typ. 1 A	Typ. 0.88 A
Environmental conditions	5AC901.IUPS-00	5AC901.IUPS-01
Temperature		
Operation		0 to 55°C ³⁾
Relative humidity		
Operation		5 to 90%, non-condensing
Mechanical characteristics	5AC901.IUPS-00	5AC901.IUPS-01
Weight		Approx. 28 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ The interface option provides protection against short circuits. This does not apply to the connected battery unit.

³⁾ Detailed information can be found in the temperature tables in the user's manual.

Uninterruptible power supplies

5AC901.BUPS-00, 5AC901.BUPS-01



General information	5AC901.BUPS-00	5AC901.BUPS-01
Battery		
Service life	Up to 15 years at 20°C / 10 years at 25°C ¹⁾	Up to 5 years at 20°C ²⁾
Design	Single cell	Maintenance-free lead acid battery
Temperature sensor		NTC resistance
Maintenance interval during storage		6-month interval between charges
Certification		
CE		Yes
cULus		Yes
cULus HazLoc Class 1 Division 2		Yes ³⁾
GOST-R		Yes
Charge duration when battery low	Typ. 7 hours	Typ. 5 hours
Electrical characteristics	5AC901.BUPS-00	5AC901.BUPS-01
Nominal voltage	24 V	24 V
Capacity	4.5 Ah	2.2 Ah
Fuse	Yes	Yes
Battery charging data		
Charging current ⁴⁾	Typ. 1 A	Typ. 0.88 A
Environmental conditions	5AC901.BUPS-00	5AC901.BUPS-01
Temperature		
Operation	-30 to 60°C ⁵⁾	0 to 40°C ⁵⁾
Relative humidity		
Operation	5 to 95%, non-condensing	25 to 85%, non-condensing
Mechanical characteristics	5AC901.BUPS-00	5AC901.BUPS-01
Dimensions		
Width	223.2 mm	188 mm
Height	78.2 mm	78 mm
Depth	145 mm	115 mm
Weight	Approx. 4600 g	Approx. 2550 g

¹⁾ Depends on the charging and discharging cycles (up to 80% battery capacity).

²⁾ Depends on the charging and discharging cycles.

³⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

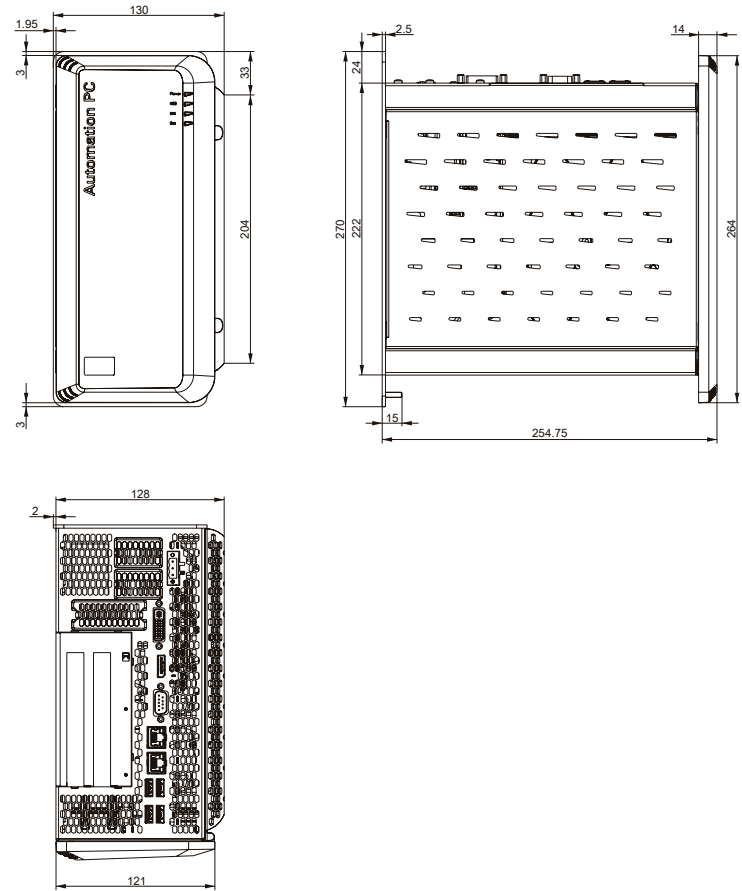
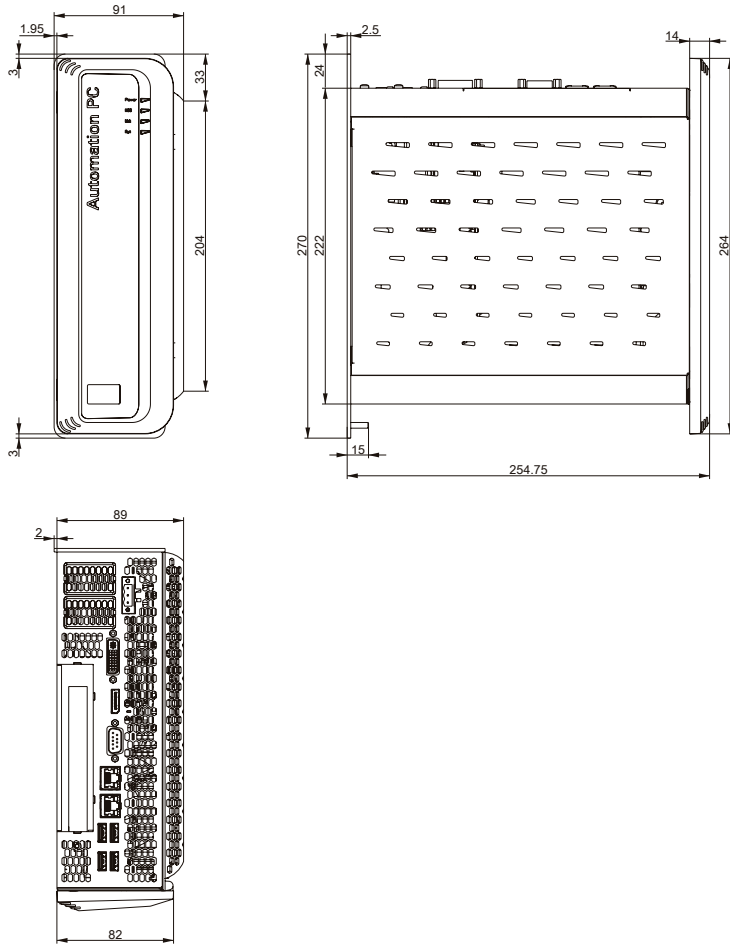
⁴⁾ Maximum charging current.

⁵⁾ Battery backing is no longer provided if the temperature falls below the minimum temperature or rises above the maximum temperature. Charging also no longer takes place since this could lead to battery damage.

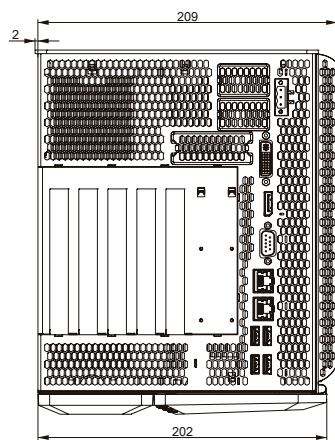
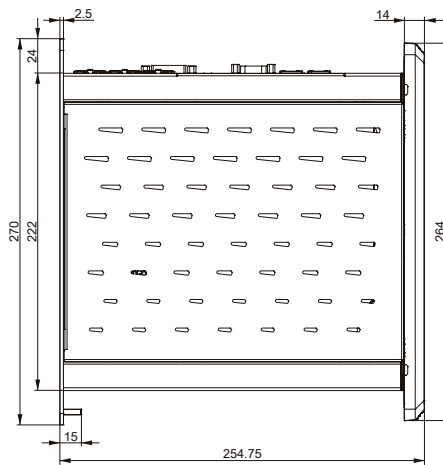
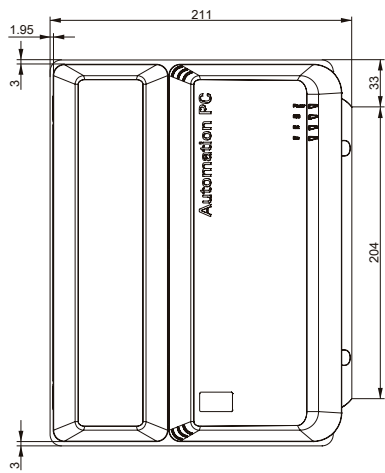


Dimensions

Dimensions



All dimensions are specified in mm.



All dimensions are specified in mm.

Model number	Width	Height	Depth
5PC910.SX01-00	91 mm	270 mm	254.75 mm
5PC910.SX02-00	130 mm	270 mm	254.75 mm
5PC910.SX05-00	211 mm	270 mm	254.75 mm



Panel PC 2100

Maximum performance comes in very small packages

With an ultracompact housing that corresponds to the dimensions of a Smart Display Link receiver, the Panel PC 2100 is an extremely powerful PC system that can handle virtually any application.



Table of contents

System features	380
Data sheets	382
Dimensions	388

System features

Maximum performance comes in very small packages

The Panel PC 2100 is a full-fledged, powerful PC system that features an extremely slim housing.

This innovative PC design is based on Intel Bay Trail architecture, whose single-, dual- and quad-core processor technology represents a milestone for embedded systems – all while offering an optimal price/performance ratio.



Multi-touch panels - Optimal usability

Multi-touch panels open up new dimensions for innovative HMI design. There are numerous gestures that might be used in an application: zooming in and out and rotating objects with two fingers, scrolling through lists and switching to the next screen with a quick swipe. The main advantage of multi-touch technology is how it makes operation more intuitive. At the same time, two-hand gestures for critical or potentially dangerous operations provide an effective way of preventing unintentional operator errors. Multi-touch displays are supported by the operating systems Windows Embedded 8.1 Industry Professional, Windows 7 Professional/Ultimate and Windows Embedded Standard 7 Premium.



Communication in all directions

The Panel PC 2100 integrates all important interfaces, including 2x Gigabit Ethernet as well as 1x USB 2.0 and 1x USB 3.0. Interface modules can also be added to take advantage of fieldbus technology such as POWERLINK and CAN. For data storage, MLC-based CFast cards are available that can store up to 60 GB or more.

Compact performance

The available Intel Atom processors offer scaled processing power up to Core i3 performance levels.

The Atom processors themselves are available in five designs, from single- and dual-core all the way to quad-core processors. This guarantees the perfect match between CPU power and any application. The integrated graphics engine also delivers performance above and beyond anything possible with Core2 Duo processors. Another supported feature is DirectX 11, which makes it possible to design even more demanding HMI software.

Single-touch panels

For all applications that need to be compatible with existing systems, 4:3 panels with analog resistive touch screens are also available. This makes it possible to continue using HMI applications at their current resolution with the latest PC platform without having to modify the software a single bit.



Versatile panel technology

The second generation of Automation Panels also serves as the technological basis for B&R's Panel PC devices. This modular platform strategy results in a product portfolio with extraordinary flexibility.

The core component is the panel itself, which is transformed into an Automation Panel by adding a modular SDL/DVI receiver. Alternatively, using SDL3 opens up additional possibilities for spanning longer distances and even easier cabling. Adding the PC unit turns the same panel into a full-fledged Panel PC with scalable processing performance. Using the same front-side platform reduces the amount of warehouse space required for replacement parts. Custom variants using Automation Panels and Panel PCs therefore require only a single base unit.

Maximum flexibility

All 2nd generation Automation Panels – whether single- or multi-touch – can be transformed into a complete PC system with the Panel PC 2100. Since the Panel PC 2100 is no larger than the Smart Display Link receiver, it does not increase the system's physical depth. Connecting cables to the Ethernet and fieldbus interfaces is also extremely user-friendly since they are all accessible on one side of the Panel PC 2100.

Maximum graphics performance

The graphics engine used by Intel Atom processors is derived from Core i technology and provides powerful processing. This is also the first time that support for DirectX 11 is provided in this segment, opening up even more possibilities for enhanced graphic capabilities in SCADA and other HMI systems. All resolutions and screen sizes up to 24.0" Full HD are supported.

Operating systems

Panel PC 2100 technology closes the gap between open and real-time operating systems. In addition to Windows 7 Professional and Ultimate, it is also possible to run Windows Embedded Standard 7 and Windows Embedded Standard 7 Premium. Windows 8.1 is also supported. Whether 32- or 64-bit, all operating system versions can be used. The real-time operating system Automation Runtime turns PC systems into fully-fledged high-performance industrial controllers. The combination of Automation Runtime and Windows unites the open PC world with applications that require hard real time. Based on multi-core processor architecture, the real-time operating system runs on one core while the other cores are reserved for Windows.



Display units

The following display units can be used in the PPC2100:

Automation Panel 9x3

Model number	Description	Page
5AP923.1215-00	Automation Panel 12.1" XGA TFT - 1024 x 768 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	435
5AP923.1505-00	Automation Panel 15.0" XGA TFT - 1024 x 768 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	435
5AP923.1906-00	Automation Panel 19.0" SXGA TFT - 1280 x 1024 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	435
5AP933.156B-00	Automation Panel 15.6" HD TFT - 1366 x 768 pixels (16:9) - Multi-touch (projected capacitive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	436
5AP933.185B-00	Automation Panel 18.5" HD TFT - 1366 x 768 pixels (16:9) - Multi-touch (projected capacitive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	436
5AP933.215C-00	Automation Panel 21.5" Full HD TFT - 1920 x 1080 pixels (16:9) - Multi-touch (projected capacitive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	436
5AP933.240C-00	Automation Panel 24.0" Full HD TFT - 1920 x 1080 pixels (16:9) - Multi-touch (projected capacitive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	436

Automation Panel 1000

Model number	Description	Page
5AP1120.0573-000	Automation Panel 5.7" VGA TFT - 640 x 480 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - For PPC2100 / Link module - Installation compatible with 5PP520.0573-00	437
5AP1151.0573-000	Automation Panel 5.7" VGA TFT - 640 x 480 pixels (4:3) - Control cabinet installation - Portrait format - 22 function keys and 20 system keys - For PPC2100 / Link module - Installation compatible with 5PP551.0573-00	437
5AP1120.0702-000	Automation Panel 7.0" WVGA TFT - 800 x 480 pixels (16:10) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - For PPC2100 / Link module - Installation compatible with 5PP520.0702-00	437
5AP1120.1043-000	Automation Panel 10.4" VGA TFT - 640 x 480 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - For PPC900 / PPC2100 / Link module - Installation compatible with 5PP520.1043-00	438
5AP1180.1043-000	Automation Panel 10.4" VGA TFT - 640 x 480 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - 22 function keys - For PPC900 / PPC2100 / Link module - Installation compatible with 5PP580.1043-00/ 5AP980.1043-01	438
5AP1181.1043-000	Automation Panel 10.4" VGA TFT - 640 x 480 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Portrait format - Front USB interface - 38 function keys and 20 system keys - For PPC900 / PPC2100 / Link module - Installation compatible with 5PP581.1043-00 5AP981.1043-01/5PC781.1043-00	438
5AP1182.1043-000	Automation Panel 10.4" VGA TFT - 640 x 480 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - 44 function keys and 20 system keys - For PPC900 / PPC2100 / Link module - Installation compatible with 5PP582.1043-00 5AP982.1043-01/5PC782.1043-00	438
5AP1120.101E-000	Automation Panel 10.1" WXGA TFT - 1280 x 800 pixels (16:10) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - For PPC2100 / Link module	438
5AP1120.1214-000	Automation Panel 12.1" SVGA TFT - 800 x 600 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - For PPC900 / PPC2100 / Link module - Installation compatible with 5PP520.1214-00	439
5AP1120.121E-000	Automation Panel 12.1" WXGA TFT - 1280 x 800 pixels (16:10) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - For PPC2100 / Link module	439
5AP1120.1505-000	Automation Panel 15.0" XGA TFT - 1024 x 768 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - For PPC900 / PPC2100 / Link module - Installation compatible with 5PP520.1505-00/5AP920.1505-01/ 5PC720.1505-xx/5PC820.1505-00	439
5AP1180.1505-000	Automation Panel 15.0" XGA TFT - 1024 x 768 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - 32 function keys - For PPC900 / PPC2100 / Link modules - Installation compatible with 5PP580.1505-00/5AP980.1505-01	439
5AP1120.156B-000	Automation Panel 15.6" HD TFT - 1366 x 768 pixels (16:9) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link module	439
5AP1120.1906-000	Automation Panel 19.0" SXGA TFT - 1280 x 1024 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - For PPC900 / PPC2100 / Link module - Installation compatible with 5AP920.1906-01 5PC720.1906-00/5PC820.1906-00	439

System units

Technical data



5PPC2100.BY01-000

5PPC2100.BY11-000

5PPC2100.BY22-000

5PPC2100.BY34-000

5PPC2100.BY44-000

General information

Cooling	Passive via housing
LED status indicators	Power, CFast, Link, Run
Certification	
CE	Yes
cULus	Yes
cULus HazLoc Class 1 Division 2	Yes ¹⁾
GL	-
	Yes ²⁾

Controller

Processor					
Type	Intel Atom E3815	Intel Atom E3825	Intel Atom E3826	Intel Atom E3827	Intel Atom E3845
Clock frequency	1460 MHz	1330 MHz	1460 MHz	1750 MHz	1910 MHz
Number of cores	1		2		4
L2 cache	512 kB		1 MB		2 MB
Intel 64 architecture	Yes				
Chipset	Intel Bay Trail				
Graphics	Intel HD graphics				
Controller	Intel HD graphics				
Memory					
Type	DDR3 SDRAM				
Memory size	1 GB		2 GB		4 GB
Speed	DDR3L-1067			DDR3L-1333	
Power management	ACPI 4.0				

Interfaces

CFast slot	
Quantity	1
USB	
Quantity	2
Type	1x USB 3.0 1x USB 2.0
Ethernet	
Quantity	2
Transfer rate	10/100/1000 Mbit/s

Inserts

Interface option ³⁾	1
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Electrical characteristics

Nominal voltage	24 VDC ±25%
Nominal current	3.5 A

System units

Technical data



5PPC2100.BY01-000

5PPC2100.BY11-000

5PPC2100.BY22-000

5PPC2100.BY34-000

5PPC2100.BY44-000

Mechanical characteristics

Dimensions

Width	190 mm
Height	115 mm
Depth	29.7 mm

Weight	577 g
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¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ Yes, although applies only if all components installed within the complete system have this certification.

³⁾ The interface option cannot be replaced.

Interface options

5ACCIF01.FPLS-000, 5ACCIF01.FPLS-001



General information	5ACCIF01.FPLS-000	5ACCIF01.FPLS-001
LED status indicators		L2, L3
Certification		
CE		Yes
cULus		Yes
cULus HazLoc Class 1 Division 2		Yes ¹⁾
GL	Yes ²⁾	-
Controller	5ACCIF01.FPLS-000	5ACCIF01.FPLS-001
FRAM	32 kB	-
nvSRAM	-	512 kB
Interfaces	5ACCIF01.FPLS-000	5ACCIF01.FPLS-001
COM		
Quantity		1
Type		RS232, modem-capable, not electrically isolated
Design		10-pin, male
Max. baud rate		115 kbit/s
POWERLINK		
Quantity		1
Transmission		100BASE-TX
Type		Type 4 ³⁾
Design		Shielded RJ45
Transfer rate		100 Mbit/s
Cable length		Max. 100 m between two stations (segment length)
Environmental conditions	5ACCIF01.FPLS-000	5ACCIF01.FPLS-001
Temperature		
Operation		-20 to 55°C
Relative humidity		
Operation		5 to 90%, non-condensing
Mechanical characteristics	5ACCIF01.FPLS-000	5ACCIF01.FPLS-001
Weight		25 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ Yes, although applies only if all components installed within the complete system have this certification.

³⁾ More information is available in the Automation Studio help system (Communication - POWERLINK - General information - Hardware - IF / LS).

Interface options

5ACCIF01.FPSC-000, 5ACCIF01.FPSC-001



General information	5ACCIF01.FPSC-000	5ACCIF01.FPSC-001
LED status indicators		L1, L2, L3
Certification		
CE		Yes
cULus		Yes
cULus HazLoc Class 1 Division 2		Yes ¹⁾
GL	Yes ²⁾	-
Controller	5ACCIF01.FPSC-000	5ACCIF01.FPSC-001
FRAM	32 kB	-
nvSRAM	-	512 kB
Interfaces	5ACCIF01.FPSC-000	5ACCIF01.FPSC-001
COM		
Quantity		1
Type		RS232, not modem-capable, not electrically isolated
Design		10-pin, male
Max. baud rate		115 kbit/s
POWERLINK		
Quantity		1
Transmission		100BASE-TX
Type		Type 4 ³⁾
Design		Shielded RJ45
Transfer rate		100 Mbit/s
Cable length		Max. 100 m between two stations (segment length)
CAN		
Quantity	1	1
Design	10-pin, male, not electrically isolated	10-pin, male, electrically isolated
Transfer rate	Max. 1 Mbit/s	Max. 1 Mbit/s
Terminating resistor		
Type	Can be enabled or disabled using a sliding switch	Can be enabled or disabled using a sliding switch
X2X		
Quantity	-	1
Design	-	10-pin, male, electrically isolated
Environmental conditions	5ACCIF01.FPSC-000	5ACCIF01.FPSC-001
Temperature		
Operation		-20 to 55°C
Relative humidity		
Operation		5 to 90%, non-condensing
Mechanical characteristics	5ACCIF01.FPSC-000	5ACCIF01.FPSC-001
Weight		25 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ Yes, although applies only if all components installed within the complete system have this certification.

³⁾ More information is available in the Automation Studio help system (Communication - POWERLINK - General information - Hardware - IF / LS).

5ACCIF01.FPLK-000, 5ACCIF01.FPCC-000, 5ACCIF01.ICAN-000



General information	5ACCIF01.FPLK-000	5ACCIF01.FPCC-000	5ACCIF01.ICAN-000
LED status indicators	L1, L2, L3	L1, L2, L3	L1
Certification			
CE		Yes	
cULus		Yes	
Controller	5ACCIF01.FPLK-000	5ACCIF01.FPCC-000	5ACCIF01.ICAN-000
nvSRAM	512 kB	512 kB	-
Interfaces	5ACCIF01.FPLK-000	5ACCIF01.FPCC-000	5ACCIF01.ICAN-000
POWERLINK			
Quantity	2	1	-
Transmission	100BASE-TX	100BASE-TX	-
Type	Type 4 ¹⁾	Type 4 ¹⁾	-
Design	Shielded RJ45	Shielded RJ45	-
Transfer rate	100 Mbit/s	100 Mbit/s	-
Cable length	Max. 100 m between two stations (segment length)	Max. 100 m between two stations (segment length)	-
CAN			
Quantity	-	2	1
Design	-	10-pin, male ²⁾	10-pin, male, electrically isolated
Transfer rate	-	Max. 1 Mbit/s	Max. 1 Mbit/s
Terminating resistor			
Type	-	Can be enabled or disabled using a sliding switch ³⁾	Can be enabled or disabled using a sliding switch
X2X			
Quantity	-	1	-
Design	-	10-pin, male, electrically isolated	-
Environmental conditions	5ACCIF01.FPLK-000	5ACCIF01.FPCC-000	5ACCIF01.ICAN-000
Temperature			
Operation		-20 to 55°C	
Relative humidity			
Operation		5 to 90%, non-condensing	
Mechanical characteristics	5ACCIF01.FPLK-000	5ACCIF01.FPCC-000	5ACCIF01.ICAN-000
Weight		25 g	

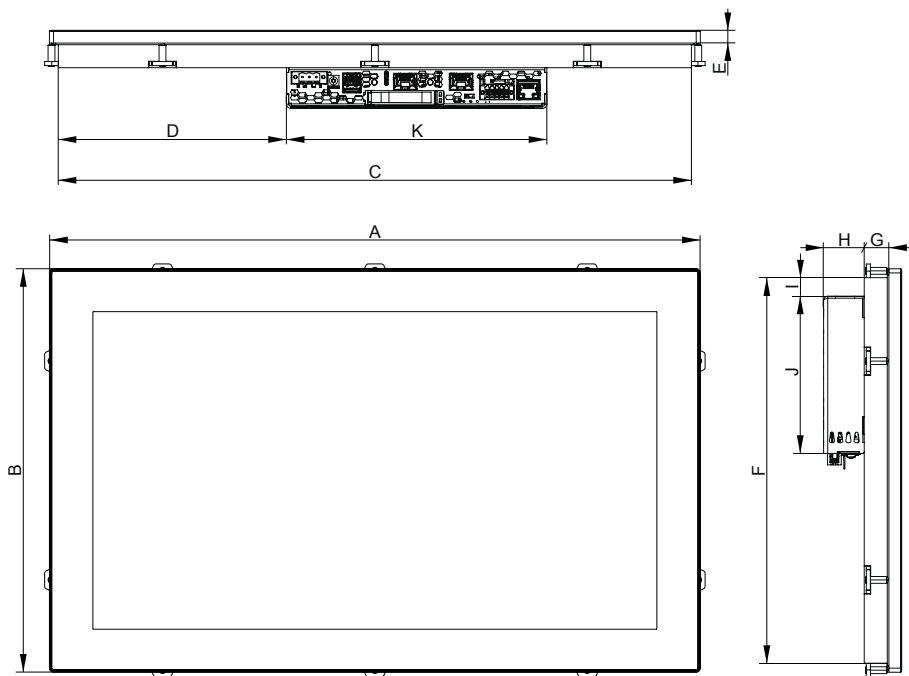
¹⁾ More information is available in the Automation Studio help system (Communication - POWERLINK - General information - Hardware - IF / LS).

²⁾ CAN1: Electrically isolated
CAN2: Not electrically isolated

³⁾ The terminating resistor can only be enabled/disabled for the CAN1 interface.

Dimensions

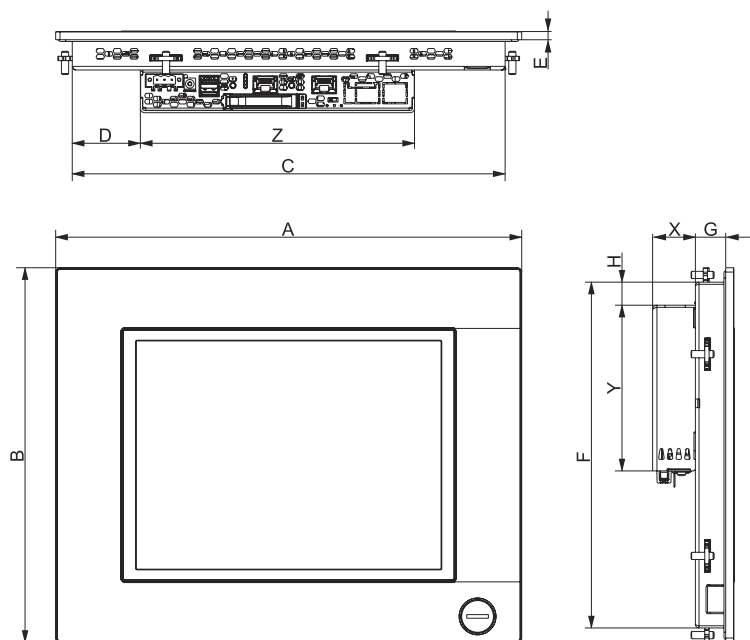
AP9x3 display units - Dimensions



All dimensions are specified in mm.

Display type	Model number	A	B	C	D	E	F	G	H
12.1" single-touch	5AP923.1215-00	315	239	302	48	9	226	13.5	13.5
15.0" single-touch	5AP923.1505-00	370	288	357	84.5	9	275	14.5	13.5
19.0" single-touch	5AP923.1906-00	440	358	427	149	9	345	23	13.5
15.6" multi-touch	5AP933.156B-00	414	258.5	401	105.5	9	245.5	20	13.5
18.5" multi-touch	5AP933.185B-00	475	295	462	166.5	9	282	18	13.5
21.5" multi-touch	5AP933.215C-00	541.5	333	528.5	199.75	9	320	18	13.5
24.0" multi-touch	5AP933.240C-00	598.5	364	585.5	228.25	9	351	18	13.5
Component	Model number	X	Y	Z					
System unit	5PPC2100.BYxx-000	29.7	115	190					

AP1000 display units with retaining clips - Dimensions

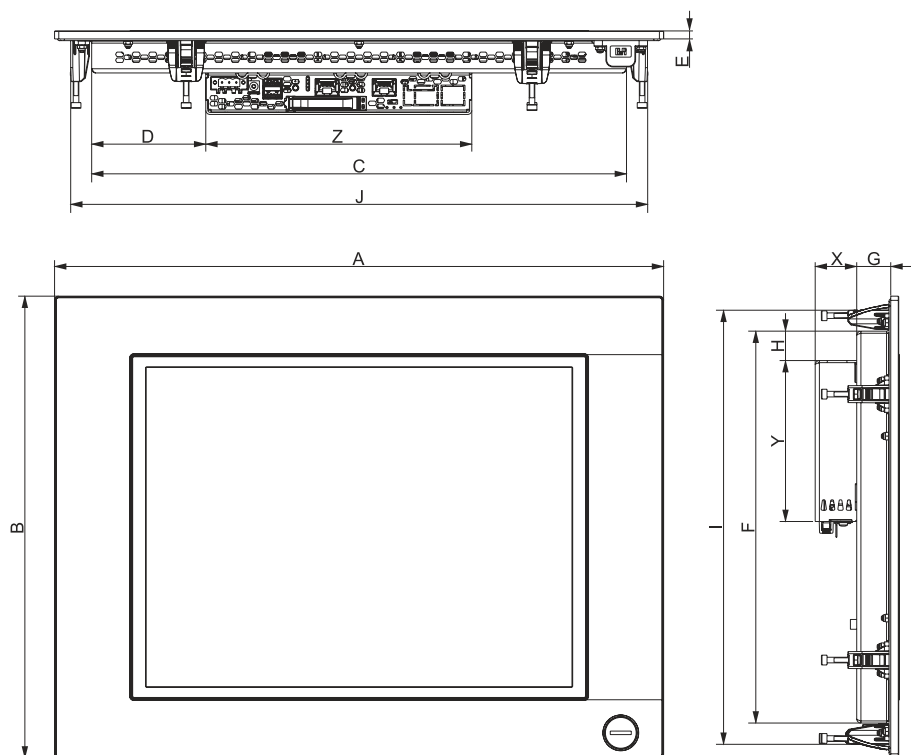


All dimensions are specified in mm.

Display type	Model number	A	B	C	D	E	F	G	H
5.7" single-touch	5AP1120.0573-000	212	156	196	3	5.7	140	19.5	2.5
5.7" keys	5AP1151.0573-000	212	245	196	3	5.7	229	19.5	2.5
7.0" single-touch	5AP1120.0702-000	212	156	196	3	5.7	140	19.5	2.5
10.1" single-touch	5AP1120.101E-000	279	191	266	38	9	178	18	13.5
10.4" single-touch	5AP1120.1043-000	323	260	300	47.2	5.7	240	21	16
10.4" single-touch with keys	5AP1180.1043-000	323	260	300	47.2	5.7	240	21	16
12.1" single-touch	5AP1120.121E-000	324	221.5	311	60.5	9	208.5	18	13.5
15.6" single-touch	5AP1120.156B-000	414	258.5	401	105.5	9	245.5	20	13.5
Component	Model number	Y	Y	Z					
System unit	5PPC2100.BYxx-000	29.7	115	190					

Dimensions

AP1000 display units with clamping blocks - Dimensions



All dimensions are specified in mm.

Display type	Model number	A	B	C	D	E	F	G	H	I	J
10.4" single-touch with keys	5AP1181.1043-000	323	358	270	70.5	5.7	305	21.3	17.5	338	300
10.4" single-touch with keys	5AP1182.1043-000	423	288	355.5	70.5	5.7	234	21.3	17.5	268	400
12.1" single-touch	5AP1120.1214-000	362	284	309	52.5	5.7	234	20.3	17.5	264	339
15.0" single-touch	5AP1120.1505-000	435	330	382	81.5	5.7	280	24.3	24	310	412
15.0" single-touch with keys	5AP1180.1505-000	435	330	382	81.5	5.7	280	24.3	24	310	412
19.0" single-touch	5AP1120.1906-000	527	421	445	186.5	5.7	351	23.3	19.3	401	507
Component	Model number	X	Y	Z							
System unit	5PPC2100.BYxx-000	29.7	115	190							



Panel PC 900

Scalable performance

The full range of Panel PC 900 processors – from the single-core Celeron up to the quad-core Core i7 – provide a versatile selection of CPU performance levels to make it the best platform for any application. Even in fanless operation, the Panel PC 900 outperforms the high-end version of its predecessor.



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System features

Multi-touch panels - Optimal usability

Multi-touch panels open up new dimensions for innovative HMI design. There are numerous gestures that might be used in an application: zooming in and out and rotating objects with two fingers, scrolling through lists and switching to the next screen with a quick swipe. The main advantage of multi-touch technology is how it makes operation more intuitive. At the same time, two-hand gestures for critical or potentially dangerous operations provide an effective way of preventing unintentional operator errors. Multi-touch displays are supported by the operating systems Windows Embedded 8.1 Industry Professional, Windows 7 Professional/Ultimate and Windows Embedded Standard 7 Premium.



Future-proof

The multi-touch variants of the Panel PC 900 are equipped with premium quality projected capacitive touch screens. The edge-to-edge, anti-glare glass surface and brilliant, high-resolution display represent the ultimate in sophisticated operating panel technology. This new series is available with mounting options for a control cabinet cutout or swing arm. The displays are equipped with long-lasting, power-saving LED backlights.

Versatile panel technology

The core component is the panel itself, which is transformed by the Panel PC 900 system into a full-featured Panel PC with scalable processing power. Using the same front-side platform for the Panel PC and Automation Panel reduces the amount of warehouse space required for replacement parts. Custom variants using Automation Panels and Panel PCs require only a single base unit.

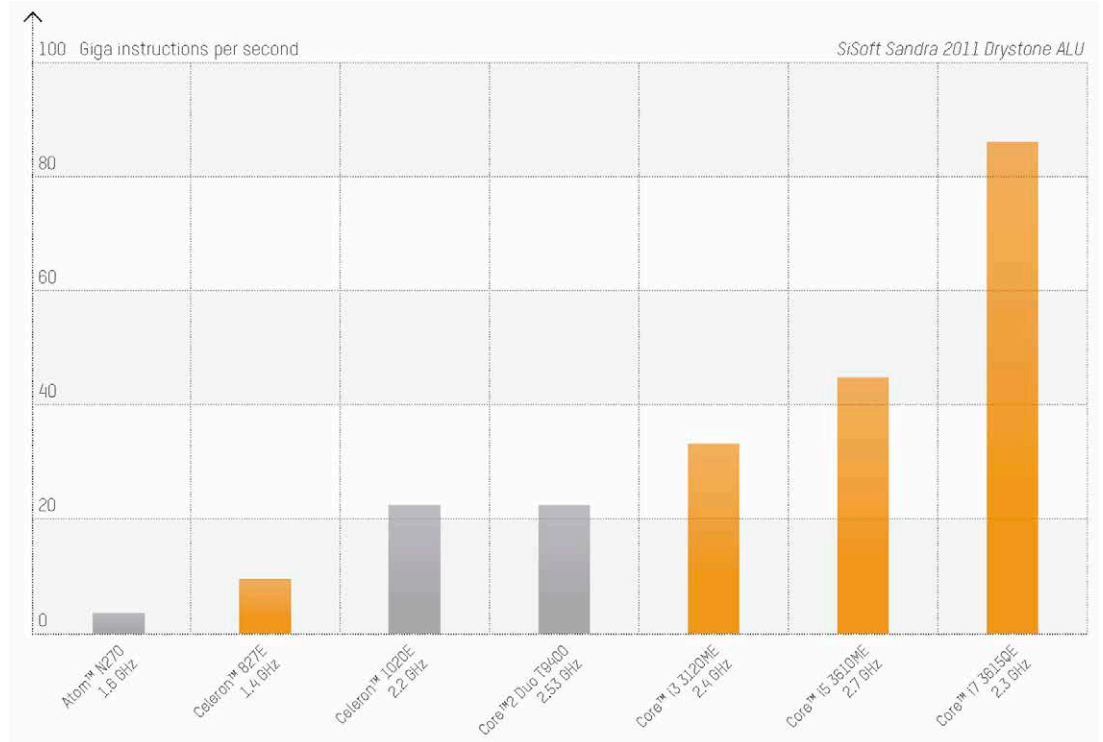
Single-touch panels

For all applications that need to be compatible with existing systems, 4:3 panels with analog resistive touch screens are also available. This makes it possible to continue using HMI applications at their current resolution with the latest PC platform without having to modify the software a single bit.



Scalable performance

The full range of Panel PC 900 processors – from the single-core Celeron up to the quad-core Core i7 – provide a versatile selection of CPU performance levels to make it the best platform for any application. Even in fanless operation, the Panel PC 900 outperforms the high-end version of its predecessor.



Compatible

The advanced design of Panel PC 900 devices provides support not only for multi-touch widescreen display systems, but also for classic 4:3 displays. Equipped with an analog resistive touch screen and display sizes up to 19", Panel PC 900 systems are fully compatible with the previous device generation with respect to the resolution and form factor of the display.

The Panel PC 900 system platform has a completely modular design that allows it to be individually adapted to an unlimited number of applications. With data storage options ranging from SSD to CFast, slots for both PCI and PCI Express, AC power supply and an integrated UPS, there are virtually no limits to what you can do.

Multi-touch

HMI panels have been used for many years to provide a way for operators to control machinery and plants. Many devices previously operated using buttons and keys have since been replaced by more versatile touch screen panels.

The advantages are clear: Whereas function keys must be retagged with slide-in labels when they are reassigned, this is possible on touch screen displays through simple software configuration. At the same time, HMI applications have developed over the years to provide much more logical and intuitive operation. This not only makes interaction much faster, it also helps avoid operating errors through the clear organization of buttons and the ability to provide much more detailed information.

Lots of room for information

With display sizes up to 24", widescreen systems can handle all of the demands of today's HMI in industrial environments. With the expanded width and higher resolution, it is possible to include even more information on each screen – an enormous advantage for user ergonomics and error-free, intuitive operation of the machine or system.

Display units

The following display units can be used in the PPC900:

Automation Panel 9x3

Model number	Description	Page
5AP923.1215-00	Automation Panel 12.1" XGA TFT - 1024 x 768 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	435
5AP923.1505-00	Automation Panel 15.0" XGA TFT - 1024 x 768 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	435
5AP923.1906-00	Automation Panel 19.0" SXGA TFT - 1280 x 1024 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	435
5AP933.156B-00	Automation Panel 15.6" HD TFT - 1366 x 768 pixels (16:9) - Multi-touch (projected capacitive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	436
5AP933.185B-00	Automation Panel 18.5" HD TFT - 1366 x 768 pixels (16:9) - Multi-touch (projected capacitive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	436
5AP933.215C-00	Automation Panel 21.5" Full HD TFT - 1920 x 1080 pixels (16:9) - Multi-touch (projected capacitive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	436
5AP933.240C-00	Automation Panel 24.0" Full HD TFT - 1920 x 1080 pixels (16:9) - Multi-touch (projected capacitive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link modules	436

Automation Panel 1000

Model number	Description	Page
5AP1120.1043-000	Automation Panel 10.4" VGA TFT - 640 x 480 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - For PPC900 / PPC2100 / Link module - Installation compatible with 5PP520.1043-00	438
5AP1180.1043-000	Automation Panel 10.4" VGA TFT - 640 x 480 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - 22 function keys - For PPC900 / PPC2100 / Link module - Installation compatible with 5PP580.1043-00/ 5AP980.1043-01	438
5AP1181.1043-000	Automation Panel 10.4" VGA TFT - 640 x 480 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Portrait format - Front USB interface - 38 function keys and 20 system keys - For PPC900 / PPC2100 / Link module - Installation compatible with 5PP581.1043-00 5AP981.1043-01/5PC781.1043-00	438
5AP1182.1043-000	Automation Panel 10.4" VGA TFT - 640 x 480 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - 44 function keys and 20 system keys - For PPC900 / PPC2100 / Link module - Installation compatible with 5PP582.1043-00 5AP982.1043-01/5PC782.1043-00	438
5AP1120.1214-000	Automation Panel 12.1" SVGA TFT - 800 x 600 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - For PPC900 / PPC2100 / Link module - Installation compatible with 5PP520.1214-00	439
5AP1120.1505-000	Automation Panel 15.0" XGA TFT - 1024 x 768 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - For PPC900 / PPC2100 / Link module - Installation compatible with 5PP520.1505-00/5AP920.1505-01/ 5PC720.1505-xx/5PC820.1505-00	439
5AP1180.1505-000	Automation Panel 15.0" XGA TFT - 1024 x 768 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - 32 function keys - For PPC900 / PPC2100 / Link modules - Installation compatible with 5PP580.1505-00/5AP980.1505-01	439
5AP1120.156B-000	Automation Panel 15.6" HD TFT - 1366 x 768 pixels (16:9) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - For PPC900 / PPC2100 / Link module	439
5AP1120.1906-000	Automation Panel 19.0" SXGA TFT - 1280 x 1024 pixels (4:3) - Single-touch (analog resistive) - Control cabinet installation - Landscape format - Front USB interface - For PPC900 / PPC2100 / Link module - Installation compatible with 5AP920.1906-01 5PC720.1906-00/5PC820.1906-00	439

CPU boards

Technical data



5PC901.TS77-00

5PC901.TS77-01

5PC901.TS77-03

5PC901.TS77-04

5PC901.TS77-05

General information

Cooling	Passive via heat sink
LED status indicators	Power, HDD, Link, Run
Battery	
Service life	4 years ¹⁾
Design	Lithium ion
Certification	
CE	Yes
cULus	Yes
cULus HazLoc Class 1 Division 2	Yes ²⁾
GOST-R	Yes

Controller

Processor					
Type	Intel Core i7-3615QE	Intel Core i7-3612QE	Intel Core i7-3517UE	Intel Core i5-3610ME	Intel Core i3-3120ME
Clock frequency	2300 MHz	2100 MHz	1700 MHz	2700 MHz	2400 MHz
Number of cores	4		2		
Intel Smart Cache	6 MB		4 MB	3 MB	
Intel 64 architecture	Yes				
Chipset	Intel QM77				
Memory slot					
Number of memory channels	2				
Type	DDR3				
Memory size	Max. 16 GB				
Graphics					
Controller	Intel HD Graphics 4000				
Resolution					
DVI	Resolution up to 1920 x 1200 (WUXGA)				
RGB	350 MHz RAMDAC, resolution up to 2048 x 1536 @ 75 Hz (QXGA)				
Power management	ACPI 4.0 with battery support				

Interfaces

COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin, male, DSUB connector
Max. baud rate	115 kbit/s
COM2	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin, male, DSUB connector
Max. baud rate	115 kbit/s
CFast slot	
Quantity	1

CPU boards

Technical data



5PC901.TS77-00

5PC901.TS77-01

5PC901.TS77-03

5PC901.TS77-04

5PC901.TS77-05

USB	
Quantity	4
Type	USB 3.0 (on bottom)
Ethernet	
Quantity	2
Transfer rate	10/100/1000 Mbit/s
Monitor/Panel interface	
Design	DVI-I
Type	SDL/DVI/Monitor
Audio	
Type	HDA
Inserts	
Slide-in compact drives	
Quantity	1
Interface option	2
Add-on UPS slot	Yes ³⁾
Insert for fan kit	Yes
Electrical characteristics	
Nominal voltage	24 VDC ±25%
Nominal current	5.5 A
Mechanical characteristics	
Weight	Approx. 450 g

¹⁾ At 50°C, 8.5 µA of the supplied components and a self-discharge of 40%. If an SRAM interface option has been installed, the service life is 2½ years.

²⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

³⁾ This UPS module can only be operated in the IF option 1 slot.

Technical data



5PC901.TS77-06

5PC901.TS77-07

5PC901.TS77-08

5PC901.TS77-09

5PC901.TS77-10

General information

Cooling	Passive via heat sink
LED status indicators	Power, HDD, Link, Run
Battery	
Service life	4 years ¹⁾
Design	Lithium ion
Certification	
CE	Yes
cULus	Yes
cULus HazLoc Class 1 Division 2	Yes ²⁾
GOST-R	Yes

Controller

Processor					
Type	Intel Core i3-3217UE	Intel Celeron 847E	Intel Celeron 827E	Intel Celeron 1020E	Intel Celeron 1047UE
Clock frequency	1600 MHz	1100 MHz	1400 MHz	2200 MHz	1400 MHz
Number of cores	2		1		2
Intel Smart Cache	3 MB	2 MB	1.5 MB		2 MB
Intel 64 architecture			Yes		
Chipset	Intel QM77			Intel HM76	
Memory slot					
Number of memory channels			2		
Type			DDR3		
Memory size			Max. 16 GB		
Graphics					
Controller	Intel HD Graphics 4000	Intel HD Graphics 2000		Intel HD Graphics 2500	
Resolution	Resolution up to 1920 x 1200 (WUXGA)				
DVI	Resolution up to 1920 x 1200 (WUXGA)				
RGB	350 MHz RAMDAC, resolution up to 2048 x 1536 @ 75 Hz (QXGA)				
Power management	ACPI 4.0 with battery support				

Interfaces

COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin, male, DSUB connector
Max. baud rate	115 kbit/s
COM2	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin, male, DSUB connector
Max. baud rate	115 kbit/s
CFast slot	
Quantity	1

CPU boards

Technical data



5PC901.TS77-06

5PC901.TS77-07

5PC901.TS77-08

5PC901.TS77-09

5PC901.TS77-10

USB	
Quantity	4
Type	USB 3.0 (on bottom)
Ethernet	
Quantity	2
Transfer rate	10/100/1000 Mbit/s
Monitor/Panel interface	
Design	DVI-I
Type	SDL/DVI/Monitor
Audio	
Type	HDA
Inserts	
Slide-in compact drives	
Quantity	1
Interface option	2
Add-on UPS slot	Yes ³⁾
Insert for fan kit	Yes
Electrical characteristics	
Nominal voltage	24 VDC ±25%
Nominal current	5.5 A
Mechanical characteristics	
Weight	Approx. 450 g

¹⁾ At 50°C, 8.5 µA of the supplied components and a self-discharge of 40%. If an SRAM interface option has been installed, the service life is 2½ years.

²⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

³⁾ This UPS module can only be operated in the IF option 1 slot.

Technical data



5PC911.SX00-00

5PC911.SX00-01

General information

Cooling	Active via fan kit Passive via heat sink	Passive via heat sink
Certification		
CE		Yes
cULus		Yes
cULus HazLoc Class 1 Division 2		Yes ¹⁾
GOST-R		Yes

Mechanical characteristics

Housing	
Material	Aluminum, Light metal die casting
Dimensions	
Width	225 mm
Height	226 mm
Depth	54 mm
Weight	Approx. 2821 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

Bus units

Technical data



5AC902.BX01-00

5AC902.BX01-01

5AC902.BX02-00

5AC902.BX02-01

5AC902.BX02-02

General information

Certification				
CE			Yes	
cULus			Yes	
cULus HazLoc Class 1 Division 2			Yes ¹⁾	
GOST-R		Yes		-

Inserts

PCI slots					
Quantity	1	-	2	1	-
Type	32-bit	-		32-bit	-
Design	PCI half-size	-		PCI half-size	-
Bus speed	33 MHz	-		33 MHz	-
PCIe slots					
Quantity	-	1	-	1	2
Design	-	PCIe half-size	-		PCIe half-size
Bus speed	-	x8 (4 GB/s)	-	x8 (4 GB/s)	x4 (2 GB/s)
Slide-in drives					
			1		

Mechanical characteristics

Dimensions				
Width			164 mm	
Height			218 mm	
Depth	54.7 mm			75 mm
Weight	Approx. 1020 g			Approx. 1220 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

Interface options

5AC901.I485-00, 5AC901.ICAN-00, 5AC901.IHDA-00



General information	5AC901.I485-00	5AC901.ICAN-00	5AC901.IHDA-00
Certification			
CE		Yes	
cULus		Yes	
cULus HazLoc Class 1 Division 2		Yes ¹⁾	
GOST-R		Yes	
GL		Yes ²⁾	
Interfaces	5AC901.I485-00	5AC901.ICAN-00	5AC901.IHDA-00
COM			
Type	RS232/RS422/RS485, electrically isolated	-	-
Design	9-pin, male, DSUB connector	-	-
Max. baud rate	115 kbit/s	-	-
CAN			
Quantity	-	1	-
Design	-	9-pin, male, DSUB connector	-
Transfer rate	-	Max. 1 Mbit/s	-
Audio			
Type	-	-	HDA sound
Terminating resistor	Yes	Yes	-
Environmental conditions	5AC901.I485-00	5AC901.ICAN-00	5AC901.IHDA-00
Temperature			
Operation		0 to 55°C ³⁾	
Relative humidity			
Operation		5 to 90%, non-condensing	
Mechanical characteristics	5AC901.I485-00	5AC901.ICAN-00	5AC901.IHDA-00
Weight	Approx. 34 g	Approx. 33 g	Approx. 21 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ Yes, although applies only if all components installed within the complete system have this certification.

³⁾ Detailed information can be found in the temperature tables in the user's manual.

Interface options

5AC901.ISRM-00, 5AC901.IPLK-00, 5AC901.IRDY-00



General information	5AC901.ISRM-00	5AC901.IPLK-00	5AC901.IRDY-00
Ready relay	-	-	Normally open contact and normally closed contact, max. 30 VDC, max. 2 A
Certification			
CE		Yes	
cULus		Yes	
cULus HazLoc Class 1 Division 2	Yes ¹⁾	Yes ¹⁾	-
GOST-R	Yes	-	-
Controller	5AC901.ISRM-00	5AC901.IPLK-00	5AC901.IRDY-00
SRAM			
Value	2 MB	2 MB	-
Remanent variables in power failure mode	256 kB (e.g. for Automation Runtime, see the AS help system)	256 kB (e.g. for Automation Runtime, see the AS help system)	-
Interfaces	5AC901.ISRM-00	5AC901.IPLK-00	5AC901.IRDY-00
POWERLINK			
Quantity	-	1	-
Transmission	-	100BASE-TX	-
Type	-	Type 4 ²⁾	-
Design	-	Shielded RJ45	-
Transfer rate	-	100 Mbit/s	-
Cable length	-	Max. 100 m between two stations (segment length)	-
Environmental conditions	5AC901.ISRM-00	5AC901.IPLK-00	5AC901.IRDY-00
Temperature			
Operation		0 to 55°C ³⁾	
Relative humidity			
Operation		5 to 90%, non-condensing	
Mechanical characteristics	5AC901.ISRM-00	5AC901.IPLK-00	5AC901.IRDY-00
Weight	Approx. 20 g	Approx. 35 g	Approx. 30 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ More information is available in the Automation Studio help system (Communication - POWERLINK - General information - Hardware - IF / LS).

³⁾ Detailed information can be found in the temperature tables in the user's manual.

Uninterruptible power supplies

5AC901.IUPS-00, 5AC901.IUPS-01



General information	5AC901.IUPS-00	5AC901.IUPS-01
Certification		
CE		Yes
cULus		Yes
cULus HazLoc Class 1 Division 2		Yes ¹⁾
GOST-R		Yes
Electrical characteristics	5AC901.IUPS-00	5AC901.IUPS-01
Deep discharge protection		Yes
Short circuit protection		Yes ²⁾
Battery charging data		
Charging current	Typ. 1 A	Typ. 0.88 A
Environmental conditions	5AC901.IUPS-00	5AC901.IUPS-01
Temperature		
Operation		0 to 55°C ³⁾
Relative humidity		
Operation		5 to 90%, non-condensing
Mechanical characteristics	5AC901.IUPS-00	5AC901.IUPS-01
Weight		Approx. 28 g

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ The interface option provides protection against short circuits. This does not apply to the connected battery unit.

³⁾ Detailed information can be found in the temperature tables in the user's manual.

Uninterruptible power supplies

5AC901.BUPS-00, 5AC901.BUPS-01



General information	5AC901.BUPS-00	5AC901.BUPS-01
Battery		
Service life	Up to 15 years at 20°C / 10 years at 25°C ¹⁾	Up to 5 years at 20°C ²⁾
Design	Single cell	Maintenance-free lead acid battery
Temperature sensor		NTC resistance
Maintenance interval during storage		6-month interval between charges
Certification		
CE		Yes
cULus		Yes
cULus HazLoc Class 1 Division 2		Yes ³⁾
GOST-R		Yes
Charge duration when battery low	Typ. 7 hours	Typ. 5 hours
Electrical characteristics	5AC901.BUPS-00	5AC901.BUPS-01
Nominal voltage	24 V	24 V
Capacity	4.5 Ah	2.2 Ah
Fuse	Yes	Yes
Battery charging data		
Charging current ⁴⁾	Typ. 1 A	Typ. 0.88 A
Environmental conditions	5AC901.BUPS-00	5AC901.BUPS-01
Temperature		
Operation	-30 to 60°C ⁵⁾	0 to 40°C ⁵⁾
Relative humidity		
Operation	5 to 95%, non-condensing	25 to 85%, non-condensing
Mechanical characteristics	5AC901.BUPS-00	5AC901.BUPS-01
Dimensions		
Width	223.2 mm	188 mm
Height	78.2 mm	78 mm
Depth	145 mm	115 mm
Weight	Approx. 4600 g	Approx. 2550 g

¹⁾ Depends on the charging and discharging cycles (up to 80% battery capacity).

²⁾ Depends on the charging and discharging cycles.

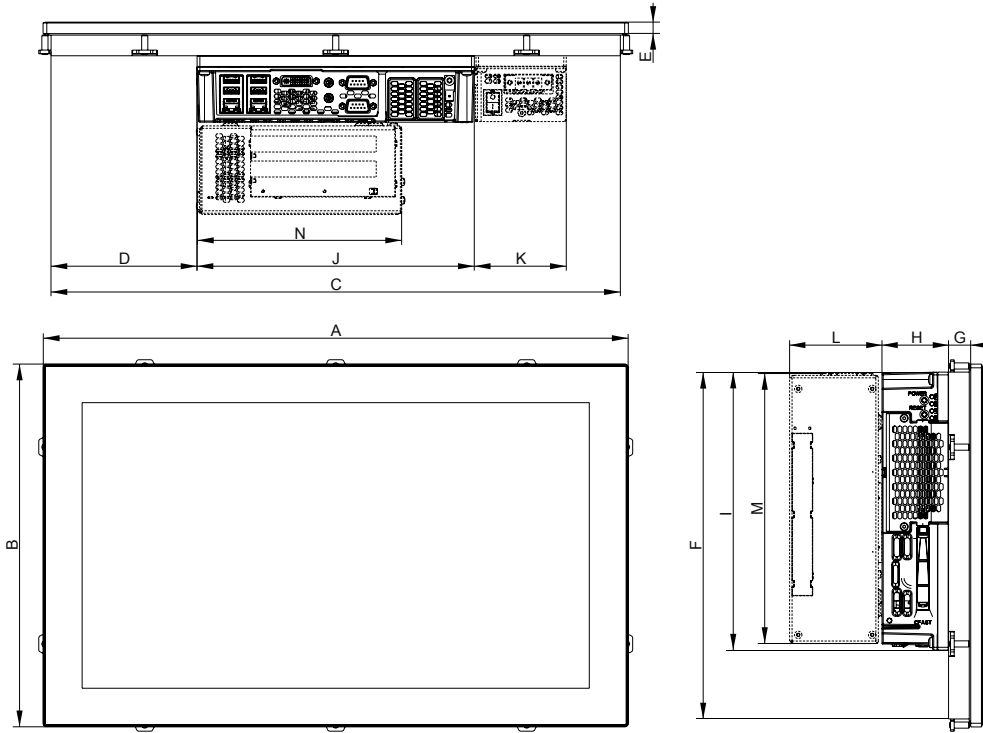
³⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

⁴⁾ Maximum charging current.

⁵⁾ Battery backing is no longer provided if the temperature falls below the minimum temperature or rises above the maximum temperature. Charging also no longer takes place since this could lead to battery damage.

Dimensions

AP9x3 display units - Dimensions

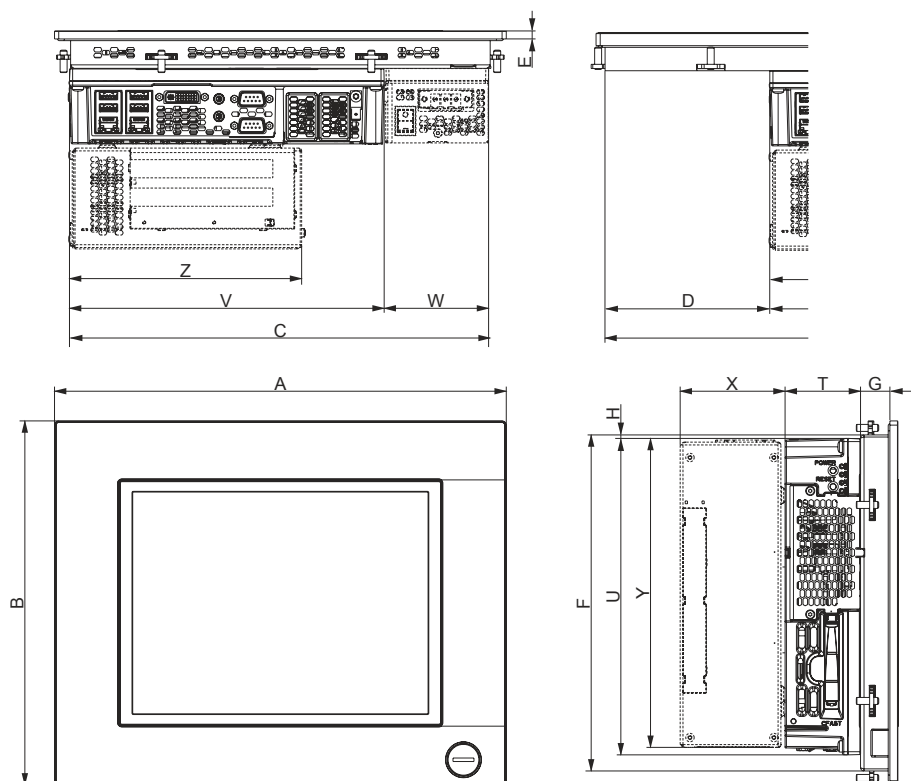


All dimensions are specified in mm.

Display type	Model number	A	B	C	D	E	F	G	H
12.1" single-touch	5AP923.1215-00	315	239	302	0	9	226	13.5	-
15.0" single-touch	5AP923.1505-00	370	288	357	36.5	9	275	14.5	-
19.0" single-touch	5AP923.1906-00	440	358	427	101	9	345	23	-
15.6" wide multi-touch	5AP933.156B-00	414	258.5	401	57.5	9	245.5	20	-
18.5" wide multi-touch	5AP933.185B-00	475	295	462	118.5	9	282	18	-
21.5" wide multi-touch	5AP933.215C-00	541.5	333	528.5	151.75	9	320	18	-
24.0" wide multi-touch	5AP933.240C-00	598.5	364	585.5	180.25	9	351	18	-
Component	Model number	T	U	V	W	X	Y	Z	
CPU board and System unit	5PC901.TS77-xx & 5PC911.SX00-xx	54	226	225	-	-	-	-	
1-slot bus unit	5AC902.BX01-xx	-	-	-	-	54.7	218	164	
2-slot bus unit	5AC902.BX02-xx	-	-	-	-	75	218	164	
Power supply	5AC902.PS00-00	53.5	225.5	-	74.5	-	-	-	

Dimensions

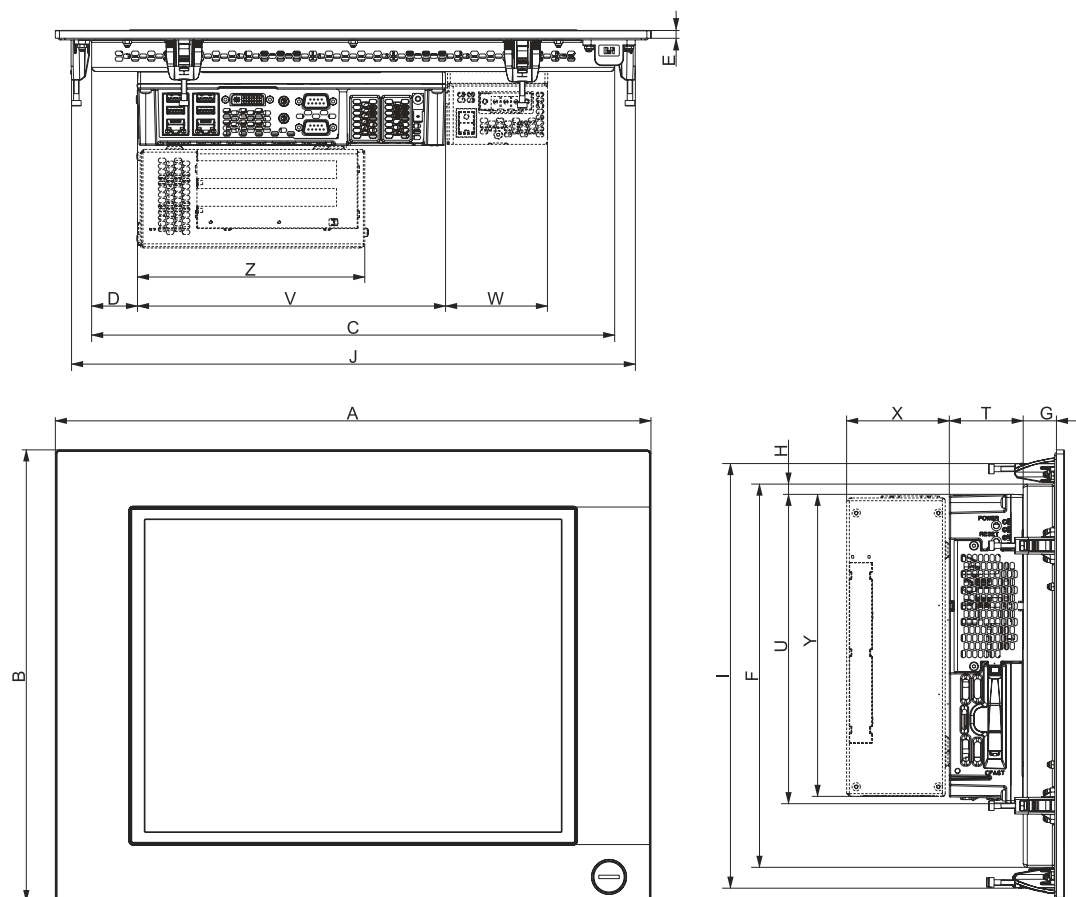
AP1000 display units with retaining clips - Dimensions



All dimensions are specified in mm.

Display type	Model number	A	B	C	D	E	F	G	H
10.4" single-touch	5AP1120.1043-000	323	260	300	-	5.7	240	21	2.5
10.4" single-touch with keys	5AP1180.1043-000	323	260	300	-	5.7	240	21	2.5
15.6" single-touch	5AP1120.156B-000	414	258.5	401	57.5	9	245.5	20	-
Component	Model number	T	U	V	W	X	Y	Z	
CPU board and System unit	5PC901.TS77-xx & 5PC911.SX00-xx	54	226	225	-	-	-	-	
1-slot bus unit	5AC902.BX01-xx	-	-	-	-	54.7	218	164	
2-slot bus unit	5AC902.BX02-xx	-	-	-	-	75	218	164	
Power supply	5AC902.PS00-00	53.5	225.5	-	74.5	-	-	-	

AP1000 display units with clamping blocks - Dimensions



All dimensions are specified in mm.

Display type	Model number	A	B	C	D	E	F	G	H	I	J
10.4" single-touch with keys	5AP1181.1043-000	323	358	270	22.5	5.7	305	21.3	4	338	300
10.4" single-touch with keys	5AP1182.1043-000	423	288	355.5	22.5	5.7	234	21.3	4	268	400
12.1" single-touch	5AP1120.1214-000	362	284	309	4.5	5.7	234	20.3	4	264	339
15.0" single-touch	5AP1120.1505-000	435	330	382	33.5	5.7	280	24.3	10.5	310	412
15.0" single-touch with keys	5AP1180.1505-000	435	330	382	33.5	5.7	280	24.3	10.5	310	412
19.0" single-touch	5AP1120.1906-000	527	421	445	138.5	5.7	351	23.3	5.8	401	507
Component	Model number	T	U	V	W	X	Y	Z			
CPU board and System unit	5PC901.TS77-xx & 5PC911.SX00-xx	54	226	225	-	-	-	-			
1-slot bus unit	5AC902.BX01-xx	-	-	-	-	54.7	218	164			
2-slot bus unit	5AC902.BX02-xx	-	-	-	-	75	218	164			
Power supply	5AC902.PS00-00	53.5	225.5	-	74.5	-	-	-			






Automation Panel 800

Modular operation and visualization

A new dimension for machine HMI.
Flexible display units with modular transmission technology.

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System features



Automation Panel 800

Fully enclosed Automation Panel 800 display systems provide maximum flexibility. The ability to mount them on a swing arm provides the freedom necessary to place the operator panel at the most ergonomic position – a decisive advantage for fatigue-free machine operation.

Optimal user guidance

All Automation Panel 800 systems are equipped with a touch screen that allows even the most complex processes to be handled intuitively. The Automation Panel 800 can also be outfitted with additional function keys that can be individually identified using slide-in labels.

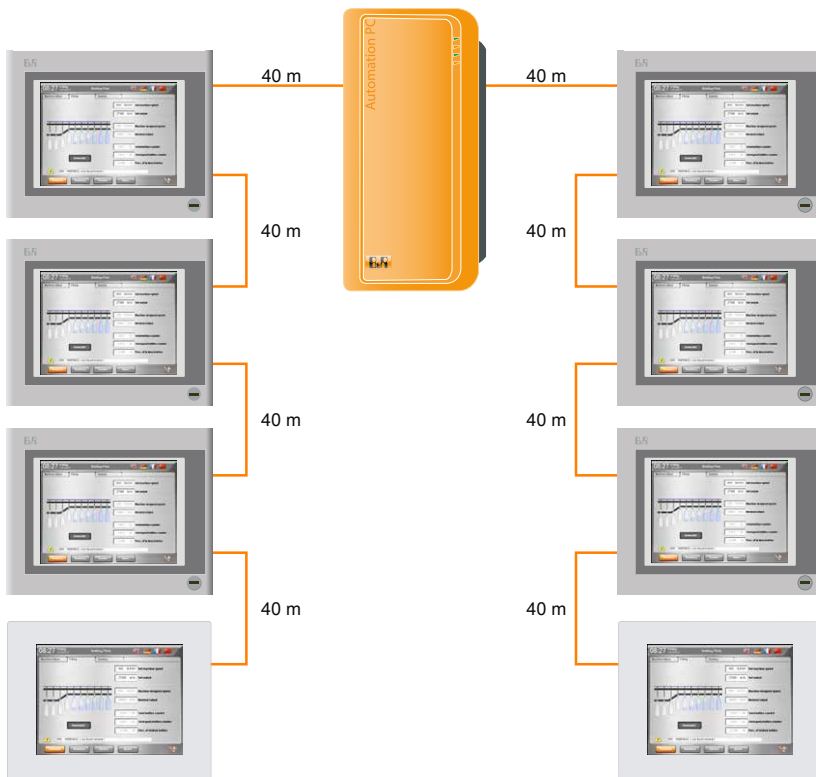


Flexible expansion

Automation Panel 800 systems can be expanded as needed. Adding keypad extensions with function keys, illuminated ring key modules and an E-stop button turns the Automation Panel into a building block system that can be adapted to any application.

Industrial design

The Automation Panel is extremely flat, allowing it to be mounted anywhere on the machine. The surface of the housing is coated with a very resistant paint.



Smart Display Link

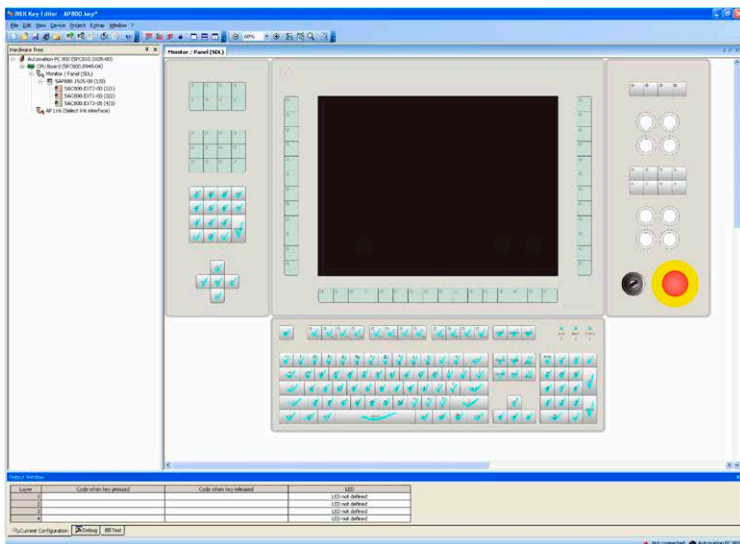
All Automation Panel systems are connected to an APC910 or PPC810 via Smart Display Link, which transfers all communication channels – from display and touch screen information to function key and LED data – via a single cable. A USB interface is also available on the keyboard extension.

Automation Panel 800 highlights:

- Smart Display Link
- Only one cable needed to transfer display, touch, matrix key, LED, USB and service data
- Dual independent display
- Distances up to 40 m per segment
- Can be combined with the Automation Panel 900

Fast and easy key configuration

On display units, it is often necessary to adapt the function keys to the respective application. On Windows-based systems, pressing F1 key usually opens context-sensitive help, behavior that is not always desired for HMI applications at runtime. B&R Automation Panel devices have an easy-to-operate key editor program. The functionality of each key can be configured separately. Each key can have up to four functions. It is even possible to send multiple characters with a single keystroke.



Display units

5AP820.1505-00, 5AP880.1505-00



General information	5AP820.1505-00	5AP880.1505-00
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
Interfaces	5AP820.1505-00	5AP880.1505-00
X2X Link		Yes
Monitor/Panel interface		
Type		SDL ¹⁾
Display	5AP820.1505-00	5AP880.1505-00
Type		Color TFT
Display size		15" (381 mm)
Colors		10 million
Resolution		XGA, 1024 x 768 pixels
Contrast		1000:1
Touch screen ²⁾		
Technology		Analog, resistive
Keys	5AP820.1505-00	5AP880.1505-00
Function keys	No	40 with LED (yellow)
Soft keys		No
System keys		No
Electrical characteristics	5AP820.1505-00	5AP880.1505-00
Nominal voltage		24 VDC ±25%
Nominal current		3.2 A
E-stop circuit loop resistance		Max. 5.5 Ω
Operating conditions	5AP820.1505-00	5AP880.1505-00
EN 60529 protection		All sides: IP65, protection from dust and sprayed water
Environmental conditions	5AP820.1505-00	5AP880.1505-00
Temperature		
Operation		0 to 50°C (mounting orientation 0°) 0 to 50°C (mounting orientation up to -45°) 0 to 45°C (mounting orientation up to +45°)
Mechanical characteristics	5AP820.1505-00	5AP880.1505-00
Housing		
Material		Aluminum (ADC12)
Dimensions		
Width		426 mm
Height		330 mm
Depth		41.3 mm (without flange)

¹⁾ SDL = Smart Display Link

²⁾ Drivers for approved operating systems are available in the Downloads section of the B&R website (www.br-automation.com).

Keypad extensions

5AC800.EXT1-00



- AP800 keypad extension (bottom)
- Alphanumeric Windows keyboard
- US International keyboard layout
- USB 1.1 interface
- IP65 protection

General information

LED status indicators	3
Certification	
CE	Yes
cULus	Yes
GOST-R	Yes

Interfaces

USB	
Quantity	1
Type	USB 1.1

Keys ¹⁾

Function keys	No
Soft keys	No
System keys	Alphanumeric keys, numeric keys, cursor block
E-stop	No
Key switches	No

Electrical characteristics

E-stop circuit loop resistance	Max. 1 Ω
--------------------------------	-----------------

Operating conditions

EN 60529 protection	All sides: IP65, protection from dust and sprayed water
---------------------	---

Environmental conditions

Temperature	
Operation	0 to 50°C

Mechanical characteristics

Housing	
Material	Aluminum (ADC12)
Installation	Designed for installation below an Automation Panel 800 display
Dimensions	
Width	426 mm
Height	146.8 mm
Depth	34.9 mm

¹⁾ Key and LED functions can be configured with the B&R Key Editor, which is available in the Downloads section of the B&R website (www.br-automation.com). This software is also included on the B&R HMI Driver & Utilities DVD (model number 5SWHMI.0000-00).

Keypad extensions

5AC800.EXT2-00, 5AC800.EXT2-01

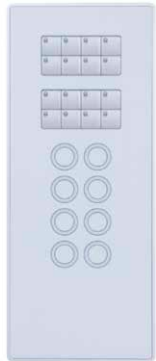


- AP800 keypad extension (left)
- 20 function keys
- 20 system keys
- IP65 protection

General information	5AC800.EXT2-00	5AC800.EXT2-01
LED status indicators		No
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
Keys ¹⁾	5AC800.EXT2-00	5AC800.EXT2-01
Function keys		20 with LED (yellow)
Soft keys		No
System keys		Numeric keys, cursor block
Illuminated ring keys		No
E-stop		No
Key switches		No
Electrical characteristics	5AC800.EXT2-00	5AC800.EXT2-01
E-stop circuit loop resistance		Max. 1 Ω
Operating conditions	5AC800.EXT2-00	5AC800.EXT2-01
EN 60529 protection		All sides: IP65, protection from dust and sprayed water
Environmental conditions	5AC800.EXT2-00	5AC800.EXT2-01
Temperature		
Operation		0 to 50°C
Mechanical characteristics	5AC800.EXT2-00	5AC800.EXT2-01
Housing		
Material		Aluminum (ADC12)
Dimensions		
Width		135 mm
Height		330 mm
Depth		34.9 mm

¹⁾ Key and LED functions can be configured with the B&R Key Editor, which is available in the Downloads section of the B&R website (www.br-automation.com). This software is also included on the B&R HMI Driver & Utilities DVD (model number 5SWHMI.0000-00).

5AC800.EXT3-00, 5AC800.EXT3-01



- AP800 keypad extension (left)
- 16 function keys
- 8 illuminated ring keys
- IP65 protection

General information	5AC800.EXT3-00	5AC800.EXT3-01
LED status indicators		No
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
Keys ¹⁾	5AC800.EXT3-00	5AC800.EXT3-01
Function keys		16 with LED (yellow)
Soft keys		No
System keys		No
Illuminated ring keys		8
E-stop		No
Key switches		No
Electrical characteristics	5AC800.EXT3-00	5AC800.EXT3-01
E-stop circuit loop resistance		Max. 5 Ω
Operating conditions	5AC800.EXT3-00	5AC800.EXT3-01
EN 60529 protection		All sides: IP65, protection from dust and sprayed water
Environmental conditions	5AC800.EXT3-00	5AC800.EXT3-01
Temperature		
Operation		0 to 50°C
Mechanical characteristics	5AC800.EXT3-00	5AC800.EXT3-01
Housing		
Material		Aluminum (ADC12)
Dimensions		
Width		135 mm
Height		330 mm
Depth		34.9 mm

¹⁾ Key and LED functions can be configured with the B&R Key Editor, which is available in the Downloads section of the B&R website (www.br-automation.com). This software is also included on the B&R HMI Driver & Utilities DVD (model number 5SWHMI.0000-00).

Keypad extensions

5AC800.EXT3-02, 5AC800.EXT3-03



- AP800 keypad extension (left)
- 4 function keys
- 12 illuminated ring keys
- E-stop switch
- Key switch
- IP65 protection

General information	5AC800.EXT3-02	5AC800.EXT3-03
LED status indicators		No
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
Keys ¹⁾	5AC800.EXT3-02	5AC800.EXT3-03
Function keys		4 with LED (yellow)
Soft keys		No
System keys		No
Illuminated ring keys		12
E-stop		2 N.C. contacts, left position
Key switches		1 N.O. contact, right position
Electrical characteristics	5AC800.EXT3-02	5AC800.EXT3-03
E-stop circuit loop resistance		Max. 5.5 Ω
Operating conditions	5AC800.EXT3-02	5AC800.EXT3-03
EN 60529 protection		All sides: IP65, protection from dust and sprayed water
Environmental conditions	5AC800.EXT3-02	5AC800.EXT3-03
Temperature		
Operation		0 to 50°C
Mechanical characteristics	5AC800.EXT3-02	5AC800.EXT3-03
Housing		
Material		Aluminum (ADC12)
Dimensions		
Width		135 mm
Height		330 mm
Depth		34.9 mm

¹⁾ Key and LED functions can be configured with the B&R Key Editor, which is available in the Downloads section of the B&R website (www.br-automation.com). This software is also included on the B&R HMI Driver & Utilities DVD (model number 5SWHMI.0000-00).

5AC800.EXT3-04, 5AC800.EXT3-05



- AP800 keypad extension (left)
- 12 function keys
- 8 illuminated ring keys
- E-stop switch
- Key switch
- IP65 protection

General information	5AC800.EXT3-04	5AC800.EXT3-05
LED status indicators		No
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
Keys ¹⁾	5AC800.EXT3-04	5AC800.EXT3-05
Function keys		12 with LED (yellow)
Soft keys		No
System keys		No
Illuminated ring keys		8
E-stop		2 N.C. contacts, right position
Key switches		1 N.O. contact, left position
Electrical characteristics	5AC800.EXT3-04	5AC800.EXT3-05
E-stop circuit loop resistance		Max. 5.5 Ω
Operating conditions	5AC800.EXT3-04	5AC800.EXT3-05
EN 60529 protection		All sides: IP65, protection from dust and sprayed water
Environmental conditions	5AC800.EXT3-04	5AC800.EXT3-05
Temperature		
Operation		0 to 50°C
Mechanical characteristics	5AC800.EXT3-04	5AC800.EXT3-05
Housing		
Material		Aluminum (ADC12)
Dimensions		
Width		135 mm
Height		330 mm
Depth		34.9 mm

¹⁾ Key and LED functions can be configured with the B&R Key Editor, which is available in the Downloads section of the B&R website (www.br-automation.com). This software is also included on the B&R HMI Driver & Utilities DVD (model number 5SWHMI.0000-00).

Cables

Technical data



5CAPWR.0018-20

5CAPWR.0050-20

5CAPWR.0100-20

5CAPWR.0150-20

5CAPWR.0200-20

5CAPWR.0250-20

5CAPWR.0300-20

5CAPWR.0400-20

General information

Certification	
CE	Yes
cULus	Yes
GOST-R	Yes

Cable construction

Wire cross section	AWG 17
--------------------	--------

Connector

Type	ODU 3-pin MINI-SNAP
Connection cycles	2000
Contacts	Gold-plated

Electrical characteristics

Operating voltage	Max. 500 V
Current load	16 A at 25°C
Conductor resistance	
AWG 17	≤19.5 Ω/km
Insulation resistance	Min. 200 MΩ/km at 20°C

Mechanical characteristics

Dimensions								
Length	1.8 m ±20 mm	5 m ±45 mm	10 m ±90 mm	15 m ±135 mm	20 m ±180 mm	25 m ±230 mm	30 m ±330 mm	40 m ±380 mm
Diameter	Max. 66 mm							
Flex radius								
Fixed installation	≥10x cable diameter (circular connector - cable)							
Flexible installation	≥15x cable diameter (circular connector - cable)							
Flexibility	Flexible							

Technical data



5CASDL.0018-20

5CASDL.0050-20

5CASDL.0100-20

5CASDL.0150-20

5CASDL.0200-20

5CASDL.0250-20

General information

Certification

CE	Yes
cULus	Yes
GOST-R	Yes

Cable construction

Wire cross section	AWG 24 / AWG 26
Features	Silicone- and halogen-free
Shield	Individual cable pairs and entire cable
Complete shielding	Aluminum-clad foil and tinned copper braiding
Outer sheathing	
Material	Special semi-glossy TMPU

Connector

Type	ODU MINI-SNAP 24-pin / DVI-D (24+1), male
Connection cycles	2000 / 200
Contacts	Gold-plated

Electrical characteristics

Operating voltage	≤30 V
Wave impedance	100 ±10 Ω
Conductor resistance	
AWG 24	≤95 Ω/km
AWG 26	≤145 Ω/km
Insulation resistance	Min. 10 MΩ/km

Mechanical characteristics

Dimensions						
Length	1.8 m ±20 mm	5 m ±45 mm	10 m ±90 mm	15 m ±135 mm	20 m ±180 mm	25 m ±230 mm
Diameter	Max. 12 mm					
Flex radius						
Fixed installation	≥6x cable diameter (from connector - ferrite bead, circular connector - ferrite bead)					
Flexible installation	≥15x cable diameter (from connector - ferrite bead, circular connector - ferrite bead)					
Flexibility	Flexible; valid for circular connector - ferrite bead (tested 300,000 cycles with 15x cable diameter, 4800 cycles/hour)					

Technical data



5CASDL.0300-30

5CASDL.0400-30

General information

Certification	
CE	Yes
cULus	Yes
GOST-R	Yes

Cable construction

Wire cross section	AWG 24 / AWG 26
Features	Silicone- and halogen-free
Shield	Individual cable pairs and entire cable
Complete shielding	Aluminum-clad foil and tinned copper braiding
Outer sheathing	
Material	Special semi-glossy TMPU

Connector

Type	ODU MINI-SNAP 24-pin / DVI-D (24+1), male
Connection cycles	2000 / 200
Contacts	Gold-plated

Electrical characteristics

Operating voltage	≤30 V
Wave impedance	100 ±10 Ω
Conductor resistance	
AWG 24	≤95 Ω/km
AWG 26	≤145 Ω/km
Insulation resistance	Min. 10 MΩ/km

Mechanical characteristics

Dimensions		
Length	30 m ±280 mm	40 m ±380 mm
Diameter	Max. 12 mm	
Flex radius		
Fixed installation	≥6x cable diameter (connector - ferrite bead, circular connector - extender) ≥10x cable diameter (ferrite bead - extender)	
Flexible installation	≥15x cable diameter (male connector - ferrite bead)	
Flexibility	Flexible; valid for circular connector - ferrite bead (tested 300,000 cycles with 15x cable diameter, 4800 cycles/hour)	

Technical data



5CAX2X.0018-20

5CAX2X.0050-20

5CAX2X.0100-20

5CAX2X.0150-20

5CAX2X.0200-20

5CAX2X.0250-20

5CAX2X.0300-20

5CAX2X.0400-20

General information

Certification

CE	Yes
cULus	Yes
GOST-R	Yes

Cable construction

Wire cross section	AWG 24 / DeviceNet data pair AWG 28 / 6 wires
Features	Silicone- and halogen-free
Shield	Individual cable pairs and entire cable
Complete shielding	Aluminum-clad foil and tinned copper braiding
Outer sheathing	
Material	Special semi-glossy TMPU

Connector

Type	ODU 10-pin MINI-SNAP
Connection cycles	2000
Contacts	Gold-plated

Electrical characteristics

Operating voltage	Max. 30 V
Wave impedance	120 ±12 Ω
Conductor resistance	
AWG 24	≤89 Ω/km
AWG 28	≤220 Ω/km
Insulation resistance	Min. 200 MΩ/km

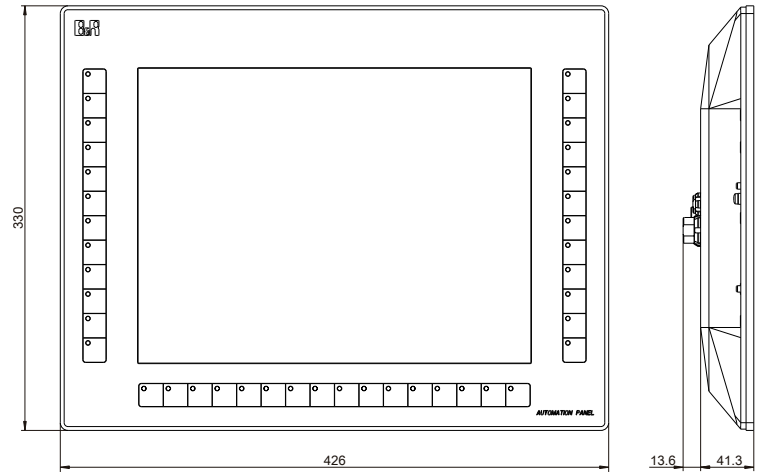
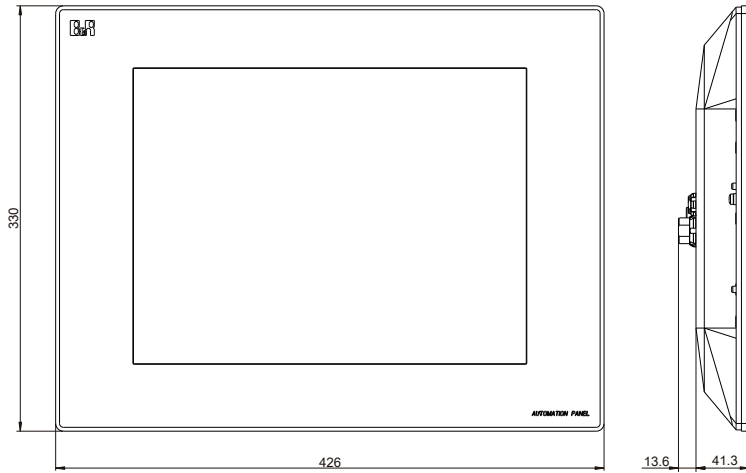
Mechanical characteristics

Dimensions

Length	1.8 m ±20 mm	5 m ±45 mm	10 m ±90 mm	15 m ±135 mm	20 m ±180 mm	25 m ±230 mm	30 m ±280 mm	40 m ±380 mm
Diameter	6.8 ±0.2 mm							
Flex radius								
Fixed installation	≥10x cable diameter (circular connector - cable)							
Flexible installation	≥15x cable diameter (circular connector - cable)							
Flexibility	Flexible							

Dimensions

Display unit dimensions



Model number

5AP820.1505-00
5AP880.1505-00

Width

426 mm
426 mm

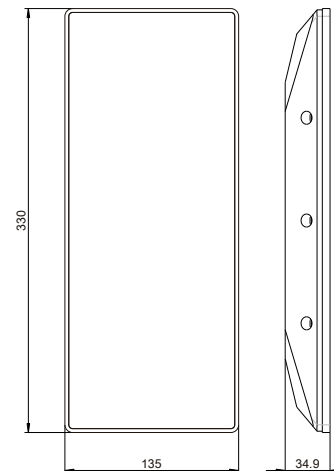
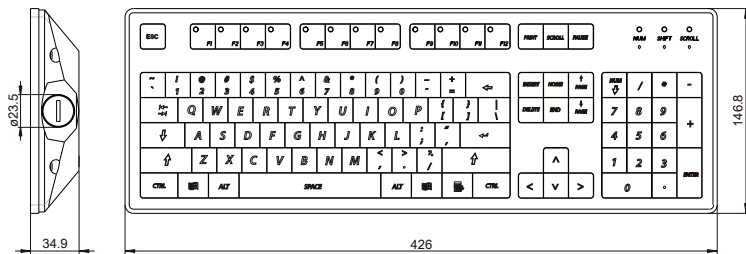
Height

330 mm
330 mm

Depth

41.3 mm (without flange)
41.3 mm (without flange)

Keypad extensions - Dimensions



Model number

5AC800.EXT1-00
5AC800.EXT2-00
5AC800.EXT2-01
5AC800.EXT3-00
5AC800.EXT3-01
5AC800.EXT3-02
5AC800.EXT3-03
5AC800.EXT3-04
5AC800.EXT3-05

Width

426 mm
135 mm
135 mm
135 mm
135 mm
135 mm
135 mm
135 mm
135 mm

Height

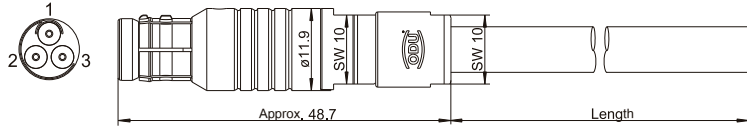
146.8 mm
330 mm
330 mm
330 mm
330 mm
330 mm
330 mm
330 mm
330 mm

Depth

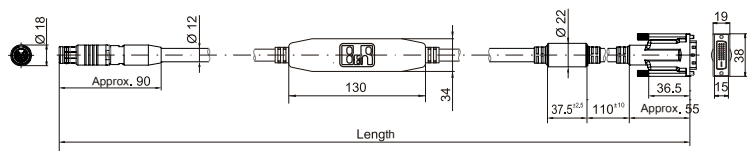
34.9 mm
34.9 mm
34.9 mm
34.9 mm
34.9 mm
34.9 mm
34.9 mm
34.9 mm
34.9 mm

Cables - Dimensions

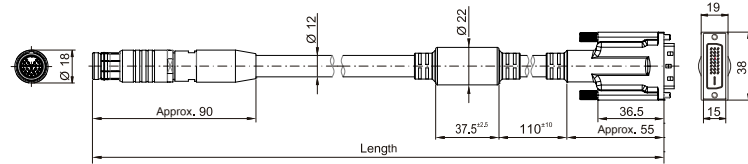
AP800 power supply cables



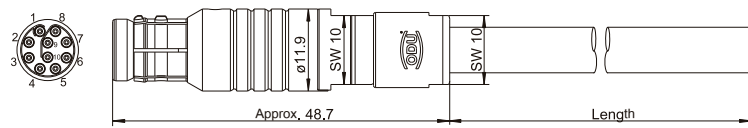
AP800 SDL cables with extender



AP800 SDL cables



AP800 X2X cables



Model number

5CAPWR.0018-20
5CAPWR.0050-20
5CAPWR.0100-20
5CAPWR.0150-20
5CAPWR.0200-20
5CAPWR.0250-20
5CAPWR.0300-20
5CAPWR.0400-20
5CASDL.0018-20
5CASDL.0050-20
5CASDL.0100-20
5CASDL.0150-20
5CASDL.0200-20
5CASDL.0250-20
5CASDL.0300-30
5CASDL.0400-30
5CAX2X.0018-20
5CAX2X.0050-20
5CAX2X.0100-20
5CAX2X.0150-20
5CAX2X.0200-20
5CAX2X.0250-20
5CAX2X.0300-20
5CAX2X.0400-20

Length

1.8 m ± 20 mm
5 m ± 45 mm
10 m ± 90 mm
15 m ± 135 mm
20 m ± 180 mm
25 m ± 230 mm
30 m ± 330 mm
40 m ± 380 mm
1.8 m ± 20 mm
5 m ± 45 mm
10 m ± 90 mm
15 m ± 135 mm
20 m ± 180 mm
25 m ± 230 mm
30 m ± 280 mm
40 m ± 380 mm
1.8 m ± 20 mm
5 m ± 45 mm
10 m ± 90 mm
15 m ± 135 mm
20 m ± 180 mm
25 m ± 230 mm
30 m ± 280 mm
40 m ± 380 mm

Diameter

Max. 6.6 mm
Max. 6.6 mm
Max. 6.6 mm
Max. 6.6 mm
Max. 6.6 mm
Max. 6.6 mm
Max. 6.6 mm
Max. 6.6 mm
Max. 12 mm
Max. 12 mm
Max. 12 mm
Max. 12 mm
Max. 12 mm
Max. 12 mm
Max. 12 mm
Max. 12 mm
Max. 12 mm
6.8 ± 0.2 mm
6.8 ± 0.2 mm
6.8 ± 0.2 mm
6.8 ± 0.2 mm
6.8 ± 0.2 mm
6.8 ± 0.2 mm
6.8 ± 0.2 mm
6.8 ± 0.2 mm

Automation Panel

Compact operation and visualization

The extensive line of Automation Panel systems offer an ideal HMI platform for any application. Whether used alone as a monitor panel or in combination as a Panel PC, the potential areas of use are virtually unlimited.



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Data sheets	430
Dimensions	446



System features

Automation Panel 900



Many variations

The Automation Panel was developed for industrial use. It is available in different designs ranging from 10.4" VGA TFT, 12.1" SVGA TFT, 15" XGA TFT up to 19" SXGA TFT with keys, touch screen and USB.

For harsh operating conditions

The front is made of milled aluminum and provides the robustness expected from operating panels in tough industrial environments. Automation Panels also have IP65 protection against sprayed water.

Maximum flexibility

All Automation Panels are equipped with an insert on the back so that modular display interfaces can be connected, allowing the right transmission technology to be matched to any machine task.

Simple handling of complex procedures

Whether operation takes place intuitively via the touch screen, function keys or a combination of both, the many different input variations available on the Automation Panel are perfect for any task.

DVI

DVI stands for Digital Video Interface. Whenever compatibility with a standard is important, DVI Link is the first choice. With a DVI connection, the Automation Panel can even be used with systems from other manufacturers. This technology supports the transmission of display data, USB 2.0 data and touch screen data over separate cables.

SDL receiver

SDL stands for Smart Display Link. With SDL, all communication between the Automation Panel and Automation PC or Panel PC is handled using a single cable. It is used to transfer not just display data, but touch screen, matrix key, LED, service and diagnostic data as well. An Automation Panel can be mounted up to 43 meters from the system unit. USB 1.1 is also fully integrated in SDL and can be transferred over this distance as well without the need for external modules. When equipped with an SDL receiver, the panels can be operated on a line.

SDL transceiver

An SDL transceiver makes it possible to connect an additional Automation Panel to the first Automation Panel. This second segment provides an additional 43 meters in length although the maximum distance may be limited by the resolution. To achieve the maximum segment length, it is possible to use cables with an integrated extender that acts as an amplifier. Additional hardware is not required.



Automation Panel 9x3/1000

Multi-touch panels - Optimal usability

Multi-touch panels open up new dimensions for innovative HMI design. There are numerous gestures that might be used in an application: zooming in and out and rotating objects with two fingers, scrolling through lists and switching to the next screen with a quick swipe. The main advantage of multi-touch technology is how it makes operation more intuitive. At the same time, two-hand gestures for critical or potentially dangerous operations provide an effective way of preventing unintentional operator errors. Multi-touch displays are supported by the operating systems Windows Embedded 8.1 Industry Professional, Windows 7 Professional/Ultimate and Windows Embedded Standard 7 Premium.



Uniform system platform

Dividing the system into a panel, Smart Display Link (SDL/SDL3) receiver and a Panel PC brings considerable benefits in the field. A damaged display can be replaced quickly, for example, without having to exchange the entire Panel PC. In this way, B&R has created a uniform interface that establishes a flexible system platform for all future PC architectures. Separating the panel from the PC architecture allows users to take advantage of advancements in PC technology with much less cost and effort by simply replacing the Panel PC with the next generation and continuing to use the existing display unit.

Single-touch panels

For all applications that need to be compatible with existing systems, 4:3 panels with analog resistive touch screens are also available. This makes it possible to continue using HMI applications at their current resolution with the latest PC platform without having to modify the software a single bit.



Versatile panel technology

The second generation of Automation Panels also serves as the technical basis for B&R's Panel PC devices. This modular platform strategy results in a product portfolio with extraordinary flexibility.

The core component is the panel itself, which is transformed into an Automation Panel by adding a modular Smart Display Link receiver. Alternatively, using Smart Display Link 3 opens up additional possibilities for spanning longer distances and even easier cabling. Adding a PC unit turns the same panel into a full-fledged Panel PC with scalable processing performance. Using the same front-side platform reduces the amount of warehouse space required for replacement parts. Custom variants using Automation Panels and Panel PCs require only a single base unit.

Wide range of variants

With an extensive product portfolio, the Automation Panel is able to handle just about any application requirement. Whether new avenues of usability are opened up with widescreen multi-touch panels or tried and true 4:3 displays are used, the most important features of this product line are its long-term availability and maximum quality for industrial usage.

Display units AP900

5AP920.1043-01, 5AP980.1043-01, 5AP981.1043-01, 5AP982.1043-01, 5AP920.1214-01



General information	5AP920.1043-01	5AP980.1043-01	5AP981.1043-01	5AP982.1043-01	5AP920.1214-01
Certification					
CE			Yes		
cULus			Yes		
GOST-R			Yes		
Interfaces	5AP920.1043-01	5AP980.1043-01	5AP981.1043-01	5AP982.1043-01	5AP920.1214-01
USB ¹⁾					
Quantity	2	2	2	2	3
Type			USB 2.0 ²⁾		
Display	5AP920.1043-01	5AP980.1043-01	5AP981.1043-01	5AP982.1043-01	5AP920.1214-01
Type			Color TFT		
Display size	10.4" (264 mm)	10.4" (264 mm)	10.4" (264 mm)	10.4" (264 mm)	12.1" (307 mm)
Colors	16 million	16 million	16 million	16 million	262,144
Resolution	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels	SVGA, 800 x 600 pixels
Contrast	700:1	700:1	700:1	700:1	800:1
Touch screen ³⁾					
Technology			Analogue, resistive		
Keys	5AP920.1043-01	5AP980.1043-01	5AP981.1043-01	5AP982.1043-01	5AP920.1214-01
Function keys	No	12 with LED (yellow)	28 with LED (yellow)	44 with LED (yellow)	No
Soft keys	No	10 with LED (yellow)	10 with LED (yellow)	No	No
System keys	No	No	Numeric keys, cursor block	Numeric keys, cursor block	No
Inserts	5AP920.1043-01	5AP980.1043-01	5AP981.1043-01	5AP982.1043-01	5AP920.1214-01
Compatible installation for PPC300 insert			Yes		
Electrical characteristics	5AP920.1043-01	5AP980.1043-01	5AP981.1043-01	5AP982.1043-01	5AP920.1214-01
Nominal voltage			24 VDC ±25%		
Nominal current			Max. 3.2 A ⁴⁾		

5AP920.1043-01, 5AP980.1043-01, 5AP981.1043-01, 5AP982.1043-01, 5AP920.1214-01

Operating conditions	5AP920.1043-01	5AP980.1043-01	5AP981.1043-01	5AP982.1043-01	5AP920.1214-01
EN 60529 protection	Back: IP20 (only with an inserted Automation Panel Link card) Front: IP65 / NEMA 250 type 4X indoor, dust and sprayed water protection				
Environmental conditions	5AP920.1043-01	5AP980.1043-01	5AP981.1043-01	5AP982.1043-01	5AP920.1214-01
Temperature					
Operation	Without Rittal housing Mounting orientation 0°: 0 to 50°C Mounting orientations to -45° display above: 0 to 50°C Mounting orientations to +45° display below: 0 to 50°C With Rittal housing Mounting orientation 0°: 0 to 50°C Mounting orientations to -45° display above: 0 to 45°C Mounting orientations to +45° display below: 0 to 45°C	Without Rittal housing Mounting orientation 0°: 0 to 50°C Mounting orientations to -45° display above: 0 to 50°C Mounting orientations to +45° display below: 0 to 50°C With Rittal housing Mounting orientation 0°: 0 to 50°C Mounting orientations to -45° display above: 0 to 45°C Mounting orientations to +45° display below: 0 to 45°C	Without Rittal housing Mounting orientation 0°: 0 to 50°C Mounting orientations to -45° display above: 0 to 50°C Mounting orientations to +45° display below: 0 to 50°C With Rittal housing Mounting orientation 0°: 0 to 50°C Mounting orientations to -45° display above: 0 to 45°C Mounting orientations to +45° display below: 0 to 45°C	Without Rittal housing Mounting orientation 0°: 0 to 50°C Mounting orientations to -45° display above: 0 to 50°C Mounting orientations to +45° display below: 0 to 50°C With Rittal housing Mounting orientation 0°: 0 to 50°C Mounting orientations to -45° display above: 0 to 45°C Mounting orientations to +45° display below: 0 to 45°C	Without Rittal housing Mounting orientation 0°: 0 to 50°C Mounting orientations to -45° display above: 0 to 50°C Mounting orientations to +45° display below: 0 to 50°C
Mechanical characteristics	5AP920.1043-01	5AP980.1043-01	5AP981.1043-01	5AP982.1043-01	5AP920.1214-01
Housing					
Material	Metal				
Dimensions					
Width	323 mm	323 mm	323 mm	423 mm	362 mm
Height	260 mm	260 mm	358 mm	288 mm	284 mm
Depth	55 mm	55 mm	55 mm	55 mm	54 mm

¹⁾ USB devices can only be connected to the Automation Panel directly (i.e. without a hub).

²⁾ Depends on the transfer technology, the transfer distance and the Automation Panel Link insert card used.

³⁾ Touch screen drivers for approved operating systems are available in the Downloads section of the B&R website.

⁴⁾ The specified value applies to Automation Panel systems with an inserted Automation Panel Link card.

Display units AP900

5AP920.1505-01, 5AP980.1505-01, 5AP981.1505-01, 5AP920.1906-01



General information	5AP920.1505-01	5AP980.1505-01	5AP981.1505-01	5AP920.1906-01
Certification				
CE			Yes	
cULus			Yes	
GOST-R			Yes	
GL	Yes ¹⁾	-	-	Yes ¹⁾
Interfaces	5AP920.1505-01	5AP980.1505-01	5AP981.1505-01	5AP920.1906-01
USB ²⁾				
Quantity			3	
Type			USB 2.0 ³⁾	
Display	5AP920.1505-01	5AP980.1505-01	5AP981.1505-01	5AP920.1906-01
Type			Color TFT	
Display size	15" (381 mm)	15" (381 mm)	15" (381 mm)	19" (482 mm)
Colors			16.7 million	
Resolution	XGA, 1024 x 768 pixels	XGA, 1024 x 768 pixels	XGA, 1024 x 768 pixels	SXGA, 1280 x 1024 pixels
Contrast			1000:1	
Touch screen ⁴⁾				
Technology			Analog, resistive	
Keys	5AP920.1505-01	5AP980.1505-01	5AP981.1505-01	5AP920.1906-01
Function keys	No	20 with LED (yellow)	20 with LED (yellow)	No
Soft keys	No	12 with LED (yellow)	12 with LED (yellow)	No
System keys	No	No	Alphanumeric keys, numeric keys, cursor block	No
Inserts	5AP920.1505-01	5AP980.1505-01	5AP981.1505-01	5AP920.1906-01
Compatible installation for PPC300 insert			Yes	
Electrical characteristics	5AP920.1505-01	5AP980.1505-01	5AP981.1505-01	5AP920.1906-01
Nominal voltage			24 VDC ±25%	
Nominal current			Max. 3.2 A ⁵⁾	

5AP920.1505-01, 5AP980.1505-01, 5AP981.1505-01, 5AP920.1906-01

Operating conditions	5AP920.1505-01	5AP980.1505-01	5AP981.1505-01	5AP920.1906-01
EN 60529 protection		Back: IP20 (only with an inserted Automation Panel Link card) Front: IP65 / NEMA 250 type 4X indoor, dust and sprayed water protection		
Environmental conditions	5AP920.1505-01	5AP980.1505-01	5AP981.1505-01	5AP920.1906-01
Temperature				
Operation	Without Rittal housing Mounting orientation 0°: 0 to 50°C Mounting orientations to -45° display above: 0 to 50°C Mounting orientations to +45° display below: 0 to 45°C With Rittal housing Mounting orientation 0°: 0 to 40°C Mounting orientations to -45° display above: 0 to 40°C Mounting orientations to +45° display below: 0 to 40°C	Without Rittal housing Mounting orientation 0°: 0 to 50°C Mounting orientations to -45° display above: 0 to 50°C Mounting orientations to +45° display below: 0 to 45°C With Rittal housing Mounting orientation 0°: 0 to 40°C Mounting orientations to -45° display above: 0 to 40°C Mounting orientations to +45° display below: 0 to 40°C	Without Rittal housing Mounting orientation 0°: 0 to 50°C Mounting orientations to -45° display above: 0 to 50°C Mounting orientations to +45° display below: 0 to 45°C With Rittal housing Mounting orientation 0°: 0 to 40°C Mounting orientations to -45° display above: 0 to 40°C Mounting orientations to +45° display below: 0 to 40°C	Without Rittal housing Mounting orientation 0°: 0 to 40°C Mounting orientations to -45° display above: 0 to 40°C Mounting orientations to +45° display below: 0 to 40°C
Mechanical characteristics	5AP920.1505-01	5AP980.1505-01	5AP981.1505-01	5AP920.1906-01
Housing				
Material			Metal	
Dimensions				
Width	435 mm	435 mm	435 mm	527 mm
Height	330 mm	330 mm	430 mm	421 mm
Depth	54 mm	54 mm	54 mm	62 mm

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

²⁾ USB devices can only be connected to the Automation Panel directly (i.e. without a hub).

³⁾ Depends on the transfer technology, the transfer distance and the Automation Panel Link insert card used.

⁴⁾ Touch screen drivers for approved operating systems are available in the Downloads section of the B&R website.

⁵⁾ The specified value applies to Automation Panel systems with an inserted Automation Panel Link card.

Display Link cards for AP900

5DLDVI.1000-01, 5DLSDL.1000-00, 5DLSDL.1000-01, 5DLS3.1000-00



General information	5DLDVI.1000-01	5DLSDL.1000-00	5DLSDL.1000-01	5DLS3.1000-00
BL adjuster ¹⁾	Yes	No	No	-
LED status indicators	-	-	-	Status, Link
Certification				
CE			Yes	
cULus			Yes	
GOST-R	Yes	Yes	Yes	-
GL	Yes ²⁾	Yes ²⁾	-	-
Interfaces	5DLDVI.1000-01	5DLSDL.1000-00	5DLSDL.1000-01	5DLS3.1000-00
COM1				
Type	RS232, not electrically isolated	-	-	-
Design	9-pin female DSUB connector	-	-	-
Max. baud rate	115 kbit/s	-	-	-
USB				
Quantity	1	-	-	1
Type	USB 2.0 if cable length ≤5 m USB 1.1 if cable length >5 m	-	-	USB 2.0
Monitor/Panel interface				
Panel IN	-	SDL	SDL	-
Panel OUT	-	-	SDL	-
Panel In				
Design	DVI-D	-	-	-
Type	SDL/DVI	-	-	-
SDL3 In				
Design	-	-	-	Shielded female RJ45 connector
Type	-	-	-	SDL3
Electrical characteristics	5DLDVI.1000-01	5DLSDL.1000-00	5DLSDL.1000-01	5DLS3.1000-00
Nominal voltage			24 VDC ±25%	
Nominal current ³⁾			Max. 4.2 A	
Mechanical characteristics	5DLDVI.1000-01	5DLSDL.1000-00	5DLSDL.1000-01	5DLS3.1000-00
Locating screws				
Quantity			2	

¹⁾ Used to set the brightness of the backlight on the AP900.

²⁾ Yes, although applies only if all components installed within the complete system have this certification.

³⁾ The specified value applies to an Automation Panel Link card being used in a 19" Automation Panel system.

Display units AP9x3

5AP923.1215-00, 5AP923.1505-00, 5AP923.1906-00



General information	5AP923.1215-00	5AP923.1505-00	5AP923.1906-00
Certification			
CE		Yes	
cULus		Yes	
cULus HazLoc Class 1 Division 2		Yes ¹⁾	
GOST-R	-	Yes	-
GL	-	Yes ²⁾	-
Display	5AP923.1215-00	5AP923.1505-00	5AP923.1906-00
Type		Color TFT	
Display size	12.1"	15.0"	19.0"
Colors	16.2 million	16.2 million	16.7 million
Resolution	XGA, 1024 x 768 pixels	XGA, 1024 x 768 pixels	SXGA, 1280 x 1024 pixels
Contrast	700:1	700:1	2000:1
Touch screen ³⁾			
Technology		Analog, resistive	
Operating conditions	5AP923.1215-00	5AP923.1505-00	5AP923.1906-00
EN 60529 protection		Front: IP65 Back: IP20 (only with installed link module or installed system unit)	
UL 50 protection		Front: Type 4X indoor use only	
Mechanical characteristics	5AP923.1215-00	5AP923.1505-00	5AP923.1906-00
Dimensions			
Width	315 mm	370 mm	440 mm
Height	239 mm	288 mm	358 mm

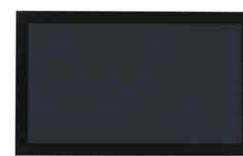
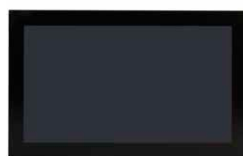
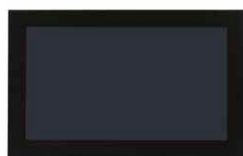
¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ Yes, although applies only if all components installed within the complete system have this certification.

³⁾ Touch screen drivers for approved operating systems are available in the Downloads section of the B&R website.

Display units AP9x3

5AP933.156B-00, 5AP933.185B-00, 5AP933.215C-00, 5AP933.240C-00



General information	5AP933.156B-00	5AP933.185B-00	5AP933.215C-00	5AP933.240C-00
Certification				
CE			Yes	
cULus			Yes	
GOST-R	Yes	Yes	Yes	-
Display	5AP933.156B-00	5AP933.185B-00	5AP933.215C-00	5AP933.240C-00
Type			Color TFT	
Display size	15.6"	18.5"	21.5"	24.0"
Colors			16.7 million	
Resolution	HD, 1366 × 768 pixels	HD, 1366 × 768 pixels	FHD, 1920 × 1080 pixels	FHD, 1920 × 1080 pixels
Contrast	500:1	1000:1	1000:1	5000:1
Touch screen				
Technology			Projected capacitive touch (PCT)	
Operating conditions	5AP933.156B-00	5AP933.185B-00	5AP933.215C-00	5AP933.240C-00
EN 60529 protection			Front: IP65 Back: IP20 (only with installed link module or installed system unit)	
UL 50 protection			Front: Type 4X indoor use only	
Mechanical characteristics	5AP933.156B-00	5AP933.185B-00	5AP933.215C-00	5AP933.240C-00
Dimensions				
Width	414 mm	475 mm	541.5 mm	598.5 mm
Height	258.5 mm	295 mm	333 mm	364 mm

Display units AP1000

5AP1120.0573-000, 5AP1151.0573-000, 5AP1120.0702-000



General information	5AP1120.0573-000	5AP1151.0573-000	5AP1120.0702-000
Certification			
CE		Yes	
cULus		Yes	
cULus HazLoc Class 1 Division 2		Yes ¹⁾	
Display	5AP1120.0573-000	5AP1151.0573-000	5AP1120.0702-000
Type		Color TFT	
Display size	5.7"	5.7"	7.0"
Colors	262,144	262,144	16 million
Resolution	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels	WVGA, 800 x 480 pixels
Contrast	850:1	850:1	600:1
Touch screen ²⁾			
Technology	Analog, resistive	-	Analog, resistive
Keys	5AP1120.0573-000	5AP1151.0573-000	5AP1120.0702-000
Function keys	-	22 with LED (yellow)	-
System keys	-	Numeric keys, cursor block	-
Operating conditions	5AP1120.0573-000	5AP1151.0573-000	5AP1120.0702-000
EN 60529 protection		Front: IP65 Back: IP20 (only with installed link module or installed system unit)	
UL 50 protection		Front: Type 4X indoor use only	
Mechanical characteristics	5AP1120.0573-000	5AP1151.0573-000	5AP1120.0702-000
Dimensions			
Width		212 mm	
Height	156 mm	245 mm	156 mm

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ Touch screen drivers for approved operating systems are available in the Downloads section of the B&R website.

Display units AP1000

5AP1120.1043-000, 5AP1180.1043-000, 5AP1181.1043-000, 5AP1182.1043-000, 5AP1120.101E-000



General information	5AP1120.1043-000	5AP1180.1043-000	5AP1181.1043-000	5AP1182.1043-000	5AP1120.101E-000
Certification					
CE			Yes		
cULus			Yes		
cULus HazLoc Class 1 Division 2			Yes ¹⁾		
Interfaces	5AP1120.1043-000	5AP1180.1043-000	5AP1181.1043-000	5AP1182.1043-000	5AP1120.101E-000
USB					
Quantity	1	1	1	1	-
Type	USB 2.0	USB 2.0	USB 2.0	USB 2.0	-
Display	5AP1120.1043-000	5AP1180.1043-000	5AP1181.1043-000	5AP1182.1043-000	5AP1120.101E-000
Type			Color TFT		
Display size	10.4"	10.4"	10.4"	10.4"	10.1"
Colors			16.2 million		
Resolution	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels	WXGA, 1280 x 800 pixels
Contrast	900:1	900:1	900:1	900:1	1000:1
Touch screen ²⁾					
Technology			Analog, resistive		
Keys	5AP1120.1043-000	5AP1180.1043-000	5AP1181.1043-000	5AP1182.1043-000	5AP1120.101E-000
Function keys	-	22 with LED (yellow)	38 with LED (yellow)	44 with LED (yellow)	-
System keys	-	No	Numeric keys, cursor block	Numeric keys, cursor block	-
Operating conditions	5AP1120.1043-000	5AP1180.1043-000	5AP1181.1043-000	5AP1182.1043-000	5AP1120.101E-000
EN 60529 protection			Front: IP65 Back: IP20 (only with installed link module or installed system unit)		
UL 50 protection			Front: Type 4X indoor use only		
Mechanical characteristics	5AP1120.1043-000	5AP1180.1043-000	5AP1181.1043-000	5AP1182.1043-000	5AP1120.101E-000
Dimensions					
Width	323 mm	323 mm	323 mm	423 mm	279 mm
Height	260 mm	260 mm	358 mm	288 mm	191 mm

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ Touch screen drivers for approved operating systems are available in the Downloads section of the B&R website.

5AP1120.1214-000, 5AP1120.121E-000, 5AP1120.1505-000, 5AP1180.1505-000, 5AP1120.156B-000, 5AP1120.1906-000



General information	5AP1120.1214-000	5AP1120.121E-000	5AP1120.1505-000	5AP1180.1505-000	5AP1120.156B-000	5AP1120.1906-000
Certification						
CE				Yes		
cULus				Yes		
cULus HazLoc Class 1 Division 2				Yes ¹⁾		
Interfaces	5AP1120.1214-000	5AP1120.121E-000	5AP1120.1505-000	5AP1180.1505-000	5AP1120.156B-000	5AP1120.1906-000
USB						
Quantity	1	-	1	1	-	1
Type	USB 2.0	-	USB 2.0	USB 2.0	-	USB 2.0
Display	5AP1120.1214-000	5AP1120.121E-000	5AP1120.1505-000	5AP1180.1505-000	5AP1120.156B-000	5AP1120.1906-000
Type				Color TFT		
Display size	12.1"	12.1"	15.0"	15.0"	15.6"	19.0"
Colors				16.2 million		
Resolution	SVGA, 800 x 600 pixels	WXGA, 1280 x 800 pixels	XGA, 1024 x 768 pixels	XGA, 1024 x 768 pixels	HD, 1366 x 768 pixels	SXGA, 1280 x 1024 pixels
Contrast	1500:1	900:1	700:1	700:1	500:1	1500:1
Touch screen ²⁾						
Technology				Analog, resistive		
Keys	5AP1120.1214-000	5AP1120.121E-000	5AP1120.1505-000	5AP1180.1505-000	5AP1120.156B-000	5AP1120.1906-000
Function keys	-	-	-	32 with LED (yellow)	-	-
System keys	-	-	-	No	-	-
Operating conditions	5AP1120.1214-000	5AP1120.121E-000	5AP1120.1505-000	5AP1180.1505-000	5AP1120.156B-000	5AP1120.1906-000
EN 60529 protection				Front: IP65 Back: IP20 (only with installed link module or installed system unit)		
UL 50 protection				Front: Type 4X indoor use only		
Mechanical characteristics	5AP1120.1214-000	5AP1120.121E-000	5AP1120.1505-000	5AP1180.1505-000	5AP1120.156B-000	5AP1120.1906-000
Dimensions						
Width	362 mm	324 mm	435 mm	435 mm	414 mm	527 mm
Height	284 mm	221.5 mm	330 mm	330 mm	258.5 mm	421 mm

¹⁾ Yes, although applies only if all components installed within the complete system have this certification and the complete system itself carries the corresponding mark.

²⁾ Touch screen drivers for approved operating systems are available in the Downloads section of the B&R website.

Link modules for AP9x3/AP1000

5DLSDL.1001-00, 5DLSD3.1001-00



General information	5DLSDL.1001-00	5DLSD3.1001-00
LED status indicators	-	Status, Link
Certification		
CE		Yes
cULus		Yes
GOST-R	Yes	-
GL	Yes ¹⁾	-
Interfaces	5DLSDL.1001-00	5DLSD3.1001-00
COM		
Type	RS232, modem-capable, not electrically isolated	-
Design	9-pin female DSUB connector	-
Max. baud rate	115 kbit/s	-
USB		
Quantity	3 (2x Type A; 1x Type B)	2
Type	USB 2.0 ²⁾	USB 2.0
Panel In		
Design	DVI-D	-
Type	SDL/DVI	-
SDL3 In		
Design	-	Shielded RJ45
Type	-	SDL3
Electrical characteristics	5DLSDL.1001-00	5DLSD3.1001-00
Nominal voltage		24 VDC ±25%
Nominal current		Max. 3 A
Mechanical characteristics	5DLSDL.1001-00	5DLSD3.1001-00
Dimensions		
Width		190 mm
Height		110 mm
Depth		23.6 mm

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

²⁾ In "SDL mode 1", USB 1.1 is the highest version possible.

DVI cables

Technical data



5CADVI.0018-00

5CADVI.0050-00

5CADVI.0100-00

General information

Certification	
CE	Yes
cULus	Yes
GOST-R	Yes
GL	Yes ¹⁾

Cable construction

Wire cross section	AWG 28
Shield	Individual cable pairs, entire cable
Complete shielding	Tinned copper braiding, optical coverage >86%
Outer sheathing	
Material	PVC

Connector

Type	2x DVI-D (18+1), male
Connection cycles	100

Electrical characteristics

Conductor resistance	Max. 237 Ω/km
Insulation resistance	Min. 100 MΩ/km

Mechanical characteristics

Dimensions			
Length	1.8 m ±50 mm	5 m ±80 mm	10 m ±100 mm
Diameter	Max. 8.5 mm		
Flex radius	≥5x cable diameter (male connector - ferrite bead and ferrite bead - ferrite bead)		

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

SDL cables

Technical data



5CASDL.0018-00

5CASDL.0050-00

5CASDL.0100-00

5CASDL.0150-00

5CASDL.0200-00

5CASDL.0250-00

5CASDL.0300-00

General information

Certification	
CE	Yes
cULus	Yes
GOST-R	Yes
GL	Yes ¹⁾

Cable construction

Wire cross section	AWG 28	AWG 24
Shield	Individual cable pairs, entire cable	
Complete shielding	Tinned copper braiding, optical coverage >85%	
Outer sheathing	PVC	
Material	PVC	

Connector

Type	2x DVI-D (24+1), male
Connection cycles	100
Contacts	Gold-plated

Electrical characteristics

Conductor resistance	
AWG 24	≤93 Ω/km
AWG 28	≤237 Ω/km
Insulation resistance	
Min. 10 MΩ/km	

Mechanical characteristics

Dimensions							
Length	1.8 m ±30 mm	5 m ±30 mm	10 m ±50 mm	15 m ±100 mm	20 m ±100 mm	25 m ±100 mm	30 m ±100 mm
Diameter	Typ. 8.6 ±0.2 mm Max. 9 mm			Typ. 11 ±0.2 mm Max. 11.5 mm			
Flex radius	≥5x cable diameter (male connector - ferrite bead and ferrite bead - ferrite bead)						
Flexibility	Limited flexibility, valid for ferrite bead - ferrite bead (tested 100 cycles with 5x cable diameter, 20 cycles/minute)						

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

Technical data



5CASDL.0018-03

5CASDL.0050-03

5CASDL.0100-03

5CASDL.0150-03

5CASDL.0200-03

5CASDL.0250-03

5CASDL.0300-03

General information

Certification	
CE	Yes
cULus	Yes
GOST-R	Yes
GL	Yes ¹⁾

Cable construction

Wire cross section	AWG 24 (control wires) AWG 26 (DVI, USB, data)
Features	Silicone- and halogen-free
Shield	Individual cable pairs, entire cable
Complete shielding	Aluminum-clad foil and tinned copper braiding
Outer sheathing	
Material	Special semi-glossy TMPU

Connector

Type	2x DVI-D (24+1), male
Connection cycles	Min. 200
Contacts	Gold-plated

Electrical characteristics

Operating voltage	≤30 V
Wave impedance	100 ±10 Ω
Conductor resistance	
AWG 24	≤95 Ω/km
AWG 26	≤145 Ω/km
Insulation resistance	>200 MΩ/km

Mechanical characteristics

Dimensions							
Length	1.8 m ±20 mm	5 m ±45 mm	10 m ±90 mm	15 m ±135 mm	20 m ±180 mm	25 m ±225 mm	30 m ±270 mm
Diameter	Max. 12 mm						
Flex radius							
Fixed installation	≥3.5x cable diameter (from male connector - ferrite bead) ≥10x cable diameter (from ferrite bead - ferrite bead)						
Flexible installation	≥15x cable diameter (from ferrite bead - ferrite bead)						
Flexibility	Flexible, valid for ferrite bead - ferrite bead (tested 300,000 cycles with 15x cable diameter, 4800 cycles/hour)						

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

SDL cables

Technical data



5CASDL.0300-13

5CASDL.0400-13

5CASDL.0430-13

General information

Certification	
CE	Yes
cULus	Yes
GOST-R	Yes
GL	Yes ¹⁾

Cable construction

Wire cross section	AWG 24 (control wires) AWG 26 (DVI, USB, data)
Features	Silicone- and halogen-free
Shield	Individual cable pairs, entire cable
Complete shielding	Aluminum-clad foil and tinned copper braiding
Outer sheathing	
Material	Special semi-glossy TMPU

Connector

Type	2x DVI-D (24+1), male
Connection cycles	Min. 200
Contacts	Gold-plated

Electrical characteristics

Operating voltage	≤30 V
Wave impedance	100 ±10 Ω
Conductor resistance	
AWG 24	≤95 Ω/km
AWG 26	≤145 Ω/km
Insulation resistance	>200 MΩ/km

Mechanical characteristics

Dimensions			
Length	30 m ±280 mm	40 m ±380 mm	43 m ±410 mm
Diameter	Max. 12 mm		
Flex radius			
Fixed installation	≥6x cable diameter (from male connector - ferrite bead) ≥10x cable diameter (from ferrite bead - ferrite bead)		
Flexible installation	≥15x cable diameter (from ferrite bead - ferrite bead)		
Flexibility	Flexible, valid for ferrite bead - ferrite bead (tested 300,000 cycles with 15x cable diameter, 4800 cycles/hour)		

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

Technical data



5CASDL.0018-01

5CASDL.0050-01

5CASDL.0100-01

5CASDL.0150-01

General information

Certification	
CE	Yes
cULus	Yes
GOST-R	Yes
GL	Yes ¹⁾

Cable construction

Wire cross section	AWG 28	AWG 24
Shield	Individual cable pairs, entire cable	
Complete shielding	Tinned copper braiding, optical coverage >85%	
Outer sheathing	PVC	
Material	PVC	

Connector

Type	2x DVI-D (24+1), male
Connection cycles	100
Contacts	Gold-plated

Electrical characteristics

Conductor resistance	
AWG 24	≤93 Ω/km
AWG 28	≤237 Ω/km
Insulation resistance	
Min. 10 MΩ/km	

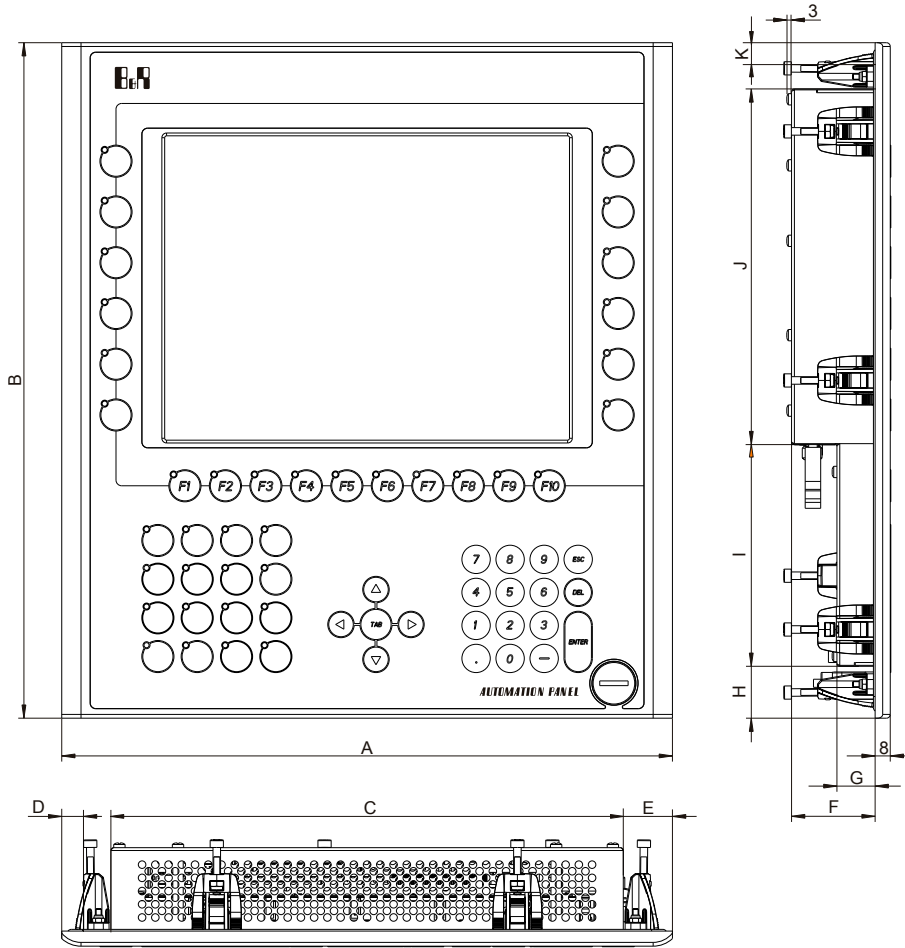
Mechanical characteristics

Dimensions				
Length	1.8 m ±30 mm	5 m ±50 mm	10 m ±100 mm	15 m ±100 mm
Diameter	Max. 9 mm		Max. 11.5 mm	
Flex radius		≥5x cable diameter (male connector - ferrite bead and ferrite bead - ferrite bead)		
Flexibility		Limited flexibility, valid for ferrite bead - ferrite bead (tested 100 cycles with 5x cable diameter, 20 cycles/minute)		

¹⁾ Yes, although applies only if all components installed within the complete system have this certification.

Dimensions

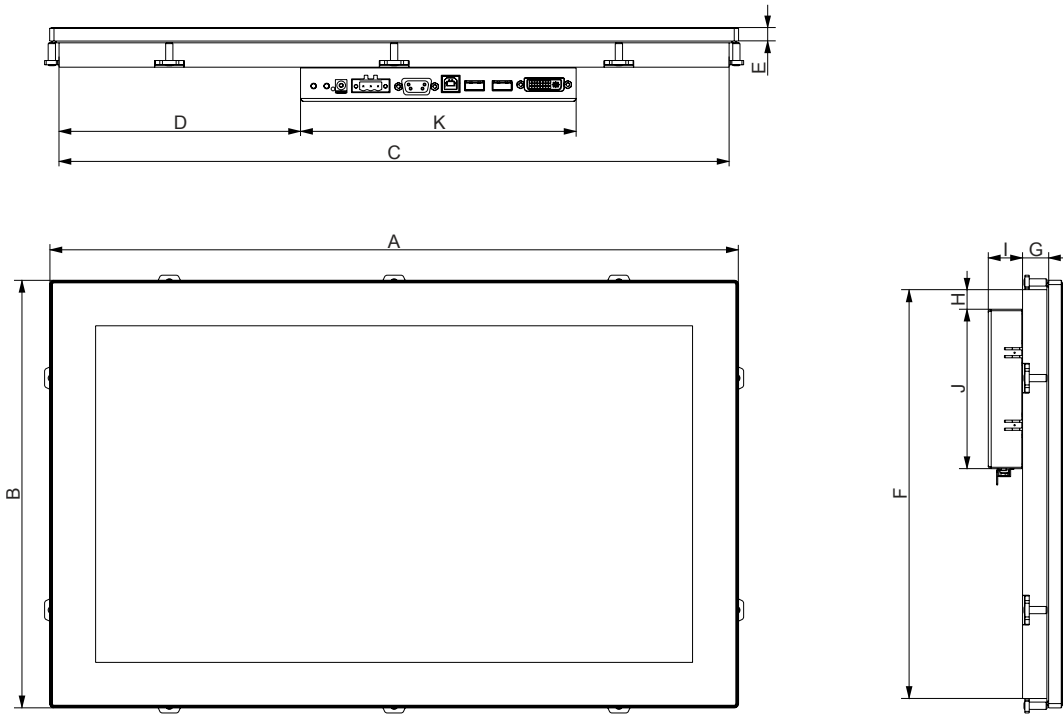
Automation Panel 900



All dimensions are specified in mm.

Display type	Model number	A	B	C	D	E	F	G	H	I	J	K
10.4" single-touch	5AP920.1043-01	323	260	271	11.5	25.9	44.2	20.2	27.5	19.5	188.5	10
10.4" single-touch	5AP980.1043-01	323	260	271	11.5	25.9	44.2	20.2	27.5	19.5	188.5	10
10.4" single-touch	5AP981.1043-01	323	258	271	11.5	25.9	44.2	20.2	27.5	117.5	188.5	10
10.4" single-touch	5AP982.1043-01	423	288	371	11.5	25.9	44.2	20.2	27.5	47.5	188.5	10
12.1" single-touch	5AP920.1214-01	362	284	310	11.5	25.9	42.2	18.2	27	38	195	10
15.0" single-touch	5AP920.1505-01	435	330	382	11.5	26.5	42.7	18.7	25	78.5	201.5	10.5
15.0" single-touch	5AP980.1505-01	435	330	382	11.5	26.5	42.2	18.2	25	78.5	201.5	10.5
15.0" single-touch	5AP981.1505-01	435	430	382	11.5	26.5	42.2	18.2	25	178.5	201.5	10.5
19.0" single-touch	5AP920.1906-01	527	421	472.5	10	27.5	50.7	26.7	29.5	109.5	251	10

Automation Panel 9x3

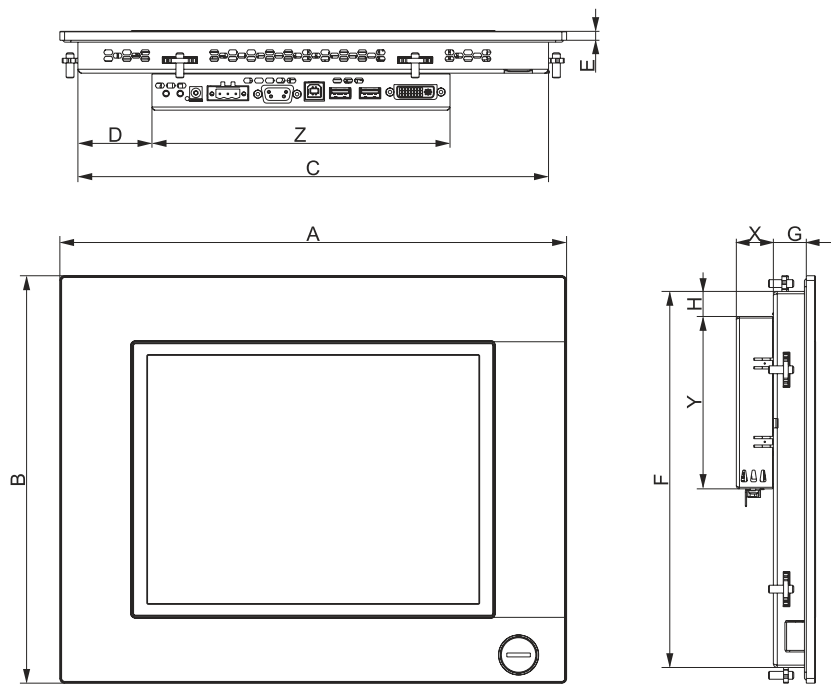


All dimensions are specified in mm.

Display type	Model number	A	B	C	D	E	F	G	H
12.1" single-touch	5AP923.1215-00	315	239	302	48	9	226	13.5	13.5
15.0" single-touch	5AP923.1505-00	370	288	357	84.5	9	275	14.5	13.5
19.0" single-touch	5AP923.1906-00	440	358	427	149	9	345	23	13.5
15.6" multi-touch	5AP933.156B-00	414	258.5	401	105.5	9	245.5	20	13.5
18.5" multi-touch	5AP933.185B-00	475	295	462	166.5	9	282	18	13.5
21.5" multi-touch	5AP933.215C-00	541.5	333	528.5	199.75	9	320	18	13.5
24.0" multi-touch	5AP933.240C-00	598.5	364	585.5	228.25	9	351	18	13.5
Link module type	Model number	I	J	K					
SDL/DVI receiver	5DLSDL.1001-00	23.6	110	190					
SDL3 receiver	5DLS3.1001-00	23.6	110	190					

Dimensions

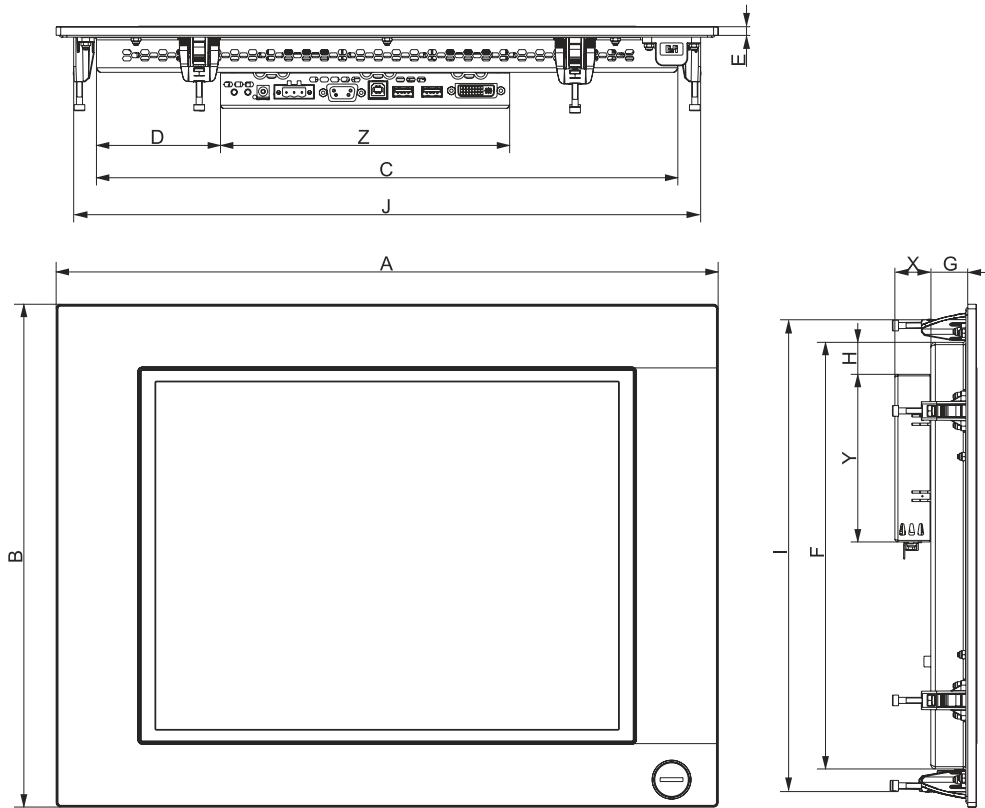
AP1000 display units with retaining clips - Dimensions



All dimensions are specified in mm.

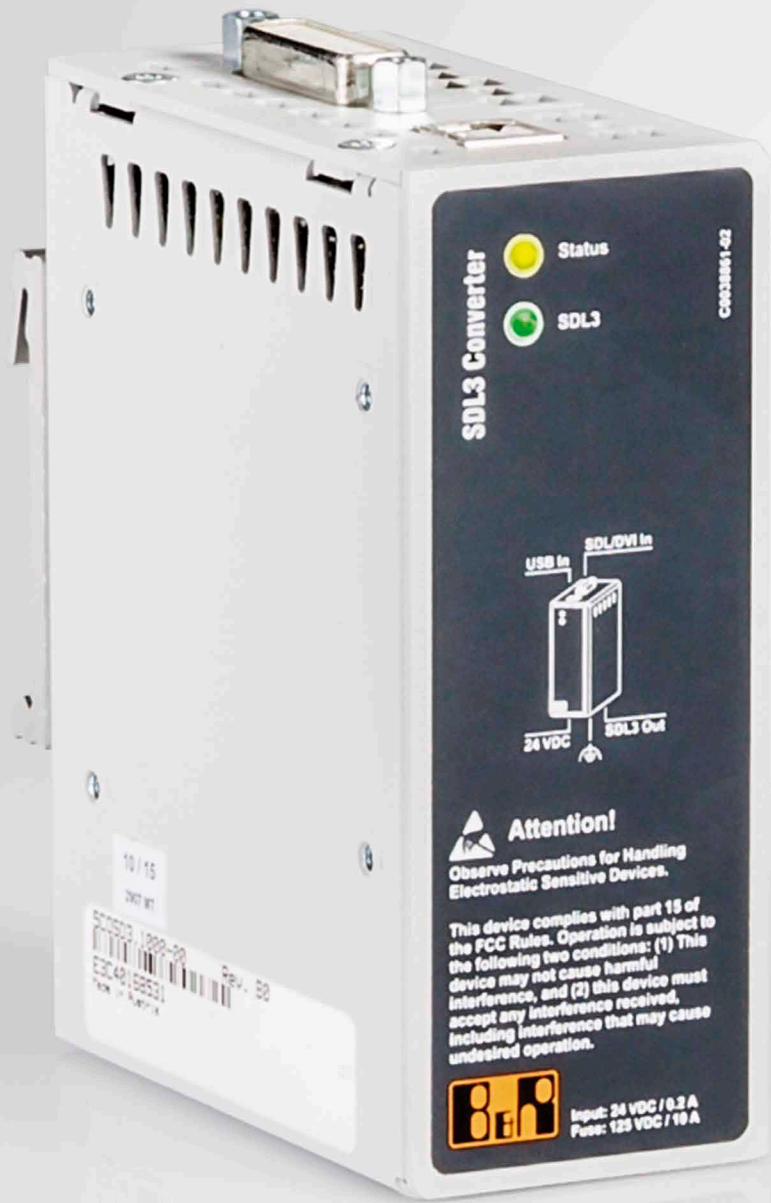
Display type	Model number	A	B	C	D	E	F	G	H
5.7" single-touch	5AP1120.0573-000	212	156	196	3	5.7	140	19.5	2.5
5.7" with keys	5AP1151.0573-000	212	245	196	3	5.7	229	19.5	2.5
7.0" single-touch	5AP1120.0702-000	212	156	196	3	5.7	140	19.5	2.5
10.1" single-touch	5AP1120.101E-000	279	191	266	38	9	178	18	13.5
10.4" single-touch	5AP1120.1043-000	323	260	300	47.2	5.7	240	21	16
10.4" single-touch with keys	5AP1180.1043-000	323	260	300	47.2	5.7	240	21	16
12.1" single-touch	5AP1120.121E-000	324	221.5	311	60.5	9	208.5	18	13.5
15.6" single-touch	5AP1120.156B-000	414	258.5	401	105.5	9	245.5	20	13.5
Link module type	Model number	X	Y	Z					
SDL/DVI receiver	5DLSDL.1001-00	23.6	110	190					
SDL3 receiver	5DLS3.1001-00	23.6	110	190					

AP1000 display units with clamping blocks - Dimensions



All dimensions are specified in mm.

Display type	Model number	A	B	C	D	E	F	G	H	I	J
10.4" single-touch with keys	5AP1181.1043-000	323	358	270	70.5	5.7	305	21.3	17.5	338	300
10.4" single-touch with keys	5AP1182.1043-000	423	288	355.5	70.5	5.7	234	21.3	17.5	268	400
12.1" single-touch	5AP1120.1214-000	362	284	309	52.5	5.7	234	20.3	17.5	264	339
15.0" single-touch	5AP1120.1505-000	435	330	382	81.5	5.7	280	24.3	24	310	412
15.0" single-touch with keys	5AP1180.1505-000	435	330	382	81.5	5.7	280	24.3	24	310	412
19.0" single-touch	5AP1120.1906-000	527	421	445	186.5	5.7	351	23.3	19.3	401	507
Link module type	Model number	X	Y	Z							
SDL/DVI receiver	5DLSL.1001-00	23.6	110	190							
SDL3 receiver	5DLS3.1001-00	23.6	110	190							





Smart Display Link 3

Revolutionary cabling

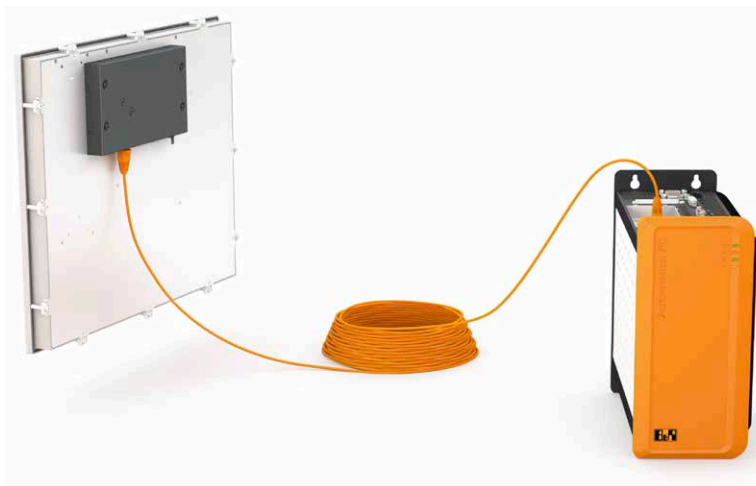
New Smart Display Link 3 transmission technology offers clear advantages for constructing modular machines and systems. Using standard Ethernet cables, it is able to transmit data over long distances.

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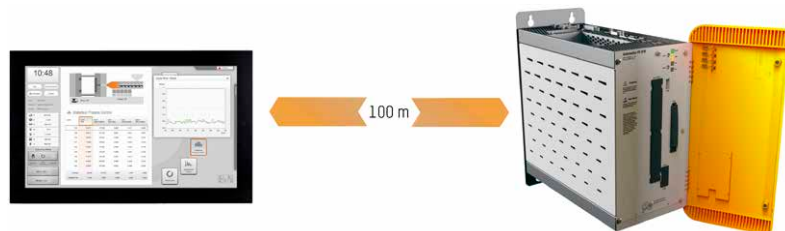
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System features



Up to 100 m

What's new about Smart Display Link 3 (SDL3) is its ability to span much greater distances. This allows for optimal placement of Automation PCs and operator panels even on more expansive systems. A second highlight of SDL3 is its use of standard Ethernet cables, which drastically reduces cable costs over longer distances. The thin cable and slim RJ45 connector are a perfect fit in tight situations such as feed-through openings and swing arm systems.



Continuity over many years

This modularity, which can be traced back to the very first Automation Panels introduced to the market ten years ago, even makes it easy to upgrade existing machines and systems to SDL3, for example during retrofitting. An optional SDL3 Converter is also available on the PC side so that the SDL interface on the Automation PC 810 or Panel PCs can be upgraded to SDL3. This kind of flexibility is unique on the market.

Flexible use with all product series

The modular design of Automation Panels provides the necessary flexibility for SDL and SDL3 to be used with all product generations and variants, including previously installed swing arm systems and customer-specific devices.

Simple cabling

The third generation of Smart Display Link represents a new chapter in the success story of this digital display transmission technology. Smart Display Link's unsurpassed convenience is owed to two key advantages: complete independence from the operating system and the ability to connect the PC to the operator panel using only a single cable.

Similar solutions used to require a thin client with a complete PC design. This not only took up more space, but was also dependent on the software and operating system being used. On top of that were the added costs of the PC architecture.

The modular design of the Automation PC 910 and Automation Panel allows them to be equipped with an optional SDL3 interface.

SDL3 converter for Automation PCs

Smart Display Link 3 (SDL3) offers even more advantages when used together with an external converter. For example, SDL3 can be used to connect Automation Panels to all Automation PC 910, Automation PC 620 and Automation PC 810 systems as well as to all Panel PCs. Upgrading systems to SDL3 in the course of retrofitting or modifications is extremely easy.

The SDL3 converter is also able to route the voltage supply so that an additional source of power on the panel is often unnecessary. The integrated SDL3 interface makes it possible to connect two Automation Panels to an Automation PC 910 in dual independent display mode.

5COSD3.1000-00



General information

LED status indicators	Status, SDL3
Certification	
CE	Yes
cULus	Yes

Interfaces

USB	
Quantity	1
Type	USB 2.0
Monitor/Panel interface	
Design	Female DVI-D connector
Type	SDL/DVI
SDL3 Out	
Design	RJ45 (female connector)
Type	SDL3

Electrical characteristics

Nominal voltage	24 VDC \pm 25%
Nominal current	0.2 A

Environmental conditions

Temperature	
Operation	0 to 55°C

Mechanical characteristics

Housing	
Material	Aluminum
Dimensions	
Width	40 mm
Height	100 mm
Depth	80 mm

SDL3 cables

Technical data



5C ASD3.0050-00

5C ASD3.0100-00

5C ASD3.0150-00

5C ASD3.0200-00

5C ASD3.0300-00

5C ASD3.0500-00

5C ASD3.1000-00

General information

Certification	
CE	Yes
cULus	Yes

Cable construction

Wire cross section	4x 2x 26/7 AWG	4x 2x 23/1 AWG
Features	Flame-resistant, halogen-free, lead-free	
Outer sheathing	Polyurethane (PUR)	
Material	Polyurethane (PUR)	
Lines	Polyethylene (PE)	
Wire insulation	Polyethylene (PE)	
Wire colors	Green/white-green, orange/white-orange, blue/white-blue, brown/white-brown	
Shield	Aluminum foil and braided wire shield made of tinned copper wires	
Type	Unprotected copper wire, 4x 2x 26/7 AWG	Unprotected copper wire, 4x 2x 23/1 AWG

Connector

Type	2x RJ45, male
Connection cycles	Min. 750
Contacts	8

Electrical characteristics ¹⁾

Operating voltage	≤100 V	≤125 V
Conductor resistance	≤290 Ω/km	≤75 Ω/km
Wave impedance	100 ±5 Ω (at 100 MHz)	
Transfer properties	Category 6A / Class EA up to 500 MHz in accordance with ISO/IEC 11801 (EN 50173-1), ISO/IEC 24702 (EN 50173-3)	Category 7 / Class F up to 600 MHz in accordance with ISO/IEC 11801 (EN 50173-1), ISO/IEC 24702 (EN 50173-3)
Insulation resistance	≥ 500 MΩ/km	≥5 GΩ/km

Operating conditions

EN 60529 protection	
Cables	IP20
RJ45 connector	IP20, only when connected properly

Mechanical characteristics

Dimensions							
Length	5 m	10 m	15 m	20 m	30 m	50 m	100 m
Diameter	6.7 mm				8.3 mm		
Flex radius							
Fixed installation	≥5x diameter				≥4x diameter		
Flexible installation	≥10x diameter				≥8x diameter		

¹⁾ At an ambient temperature of 20°C.








Mobile Panel

More than just mobile operation and monitoring

Mobile operator panels are used anywhere machine operation and monitoring require a maximum degree of flexibility. B&R has created a pioneering product line that integrates control, operation and monitoring into a single system.

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System features



Robust design for use in harsh industrial environments

The demands placed on a handheld system like the Mobile Panel are higher than those for a mounted device. This is why the Mobile Panel has a particularly robust design, with a double-reinforced housing that can absorb extremely hard impacts. Controls such as key switches and E-stop are flush-mounted, and the system's rounded housing minimizes external impacts.

As for protection, the electronics are positioned to absorb external shocks and jolts as effectively as possible, while the housing, cables, and connectors are all protected against dust and sprayed water.

A multitude of MP50 variants

Ergonomic, light and extremely impact-resistant – these are the qualities of the four handheld operating devices in the MP50 series that enable safe and simple on-site operation and monitoring.

The main differences within the series include display size and the types of operating elements. Depending on the application, these controls might include a joystick, handwheel, override potentiometer, key switch or illuminated buttons. MP50 Mobile Panel devices are available with a 6.5" VGA color TFT display.

An E-stop button is integrated via an additional connection box, which enables the devices to be connected and disconnected during operation without losing any safety functionality. Two integrated three-step enable switches, ergonomically placed for both left or right-handed operators, provide the highest degree of safety even during setup.

Operation and monitoring

On the Mobile Panel, the limited space available for display and keys is used optimally. B&R offers a wide variety of options combining function keys, numeric keys and touch screen. Frequently used functions can be assigned to pre-programmed keys, with functions that depend on the state of the machine assigned to touch buttons. A stylus for touch screen operation is located on the back of the panel.

Top performance

Processors for the Mobile Panel are based on the Intel PXA 270 CPU with 128 MB flash memory and 256 MB DRAM. The Windows CE operating system offers a flexible foundation for a wide range of application types – mobile thin clients, direct connections to the controller and open SCADA systems, for example. Not only do these double-walled panels offer IP65 protection, they also provide integrated interfaces such as USB and Ethernet 10/100 as well.

This new panel series fits seamlessly into the B&R concept and can be easily configured with Visual Components or connected to an X20 CPU to provide a compact and scalable control platform that can meet every requirement.

Operating units

5MP050.0653-01, 5MP050.0653-02, 5MP050.0653-03, 5MP050.0653-04



Controller	5MP050.0653-01	5MP050.0653-02	5MP050.0653-03	5MP050.0653-04
Processor				
Type			Intel PXA 270	
Clock frequency			416 MHz	
Graphics				
Controller			Intel PXA	
SRAM				
Value			-	
Memory				
Type			SDRAM	
Memory size			256 MB	
Interfaces	5MP050.0653-01	5MP050.0653-02	5MP050.0653-03	5MP050.0653-04
USB				
Quantity			1	
Type			USB 1.1	
Ethernet				
Quantity			1 ¹⁾	
Transfer rate			10/100 Mbit/s	
Display	5MP050.0653-01	5MP050.0653-02	5MP050.0653-03	5MP050.0653-04
Type			Color TFT	
Display size			6.5" (165 mm)	
Colors			65,535 ²⁾	
Resolution			VGA, 640 x 480 pixels	
Contrast			300:1	
Touch screen				
Technology			Analog, resistive	
Keys	5MP050.0653-01	5MP050.0653-02	5MP050.0653-03	5MP050.0653-04
Soft keys			9	
System keys			22	
3-axis joystick	No	Yes	No	No
Electronic handwheel	Yes	No	Yes	Yes
Illuminated button	Yes (white)	No	No	No
Stop button			Yes (2 N.C. contacts, on right)	
Enable switch			Yes (two 3-position switches on left and right)	
Override potentiometer	No	No	Yes	No
Key switches	No	Yes	No	Yes

Operating units

5MP050.0653-01, 5MP050.0653-02, 5MP050.0653-03, 5MP050.0653-04

Electrical characteristics	5MP050.0653-01	5MP050.0653-02	5MP050.0653-03	5MP050.0653-04
Nominal voltage	24 VDC ±25% (integrated reverse polarity protection) ¹⁾			
Operating conditions	5MP050.0653-01	5MP050.0653-02	5MP050.0653-03	5MP050.0653-04
EN 60529 protection			IP65	
Environmental conditions	5MP050.0653-01	5MP050.0653-02	5MP050.0653-03	5MP050.0653-04
Temperature				
Operation	0 to 50°C ³⁾			
Relative humidity				
Operation	Max. 95% at T ≤ 40°C, non-condensing	Max. 95%, non-condensing	Max. 95%, non-condensing	Max. 95%, non-condensing
Mechanical characteristics	5MP050.0653-01	5MP050.0653-02	5MP050.0653-03	5MP050.0653-04
Housing				
Material	ABS			
Dimensions				
Width	252 mm			
Height	114 mm			
Depth	240 mm			
Weight	Approx. 1250 g			

¹⁾ Connection via Mobile Panel cable.

²⁾ The actual number of colors depends on the graphics memory, the configured graphics mode and the graphics driver being used.

³⁾ When used with a rechargeable backup battery (5MPBAT.0000-00), the maximum temperature during operation is 45°C.

Mobile Panel cables

5CAMPH.0018-30, 5CAMPH.0050-30, 5CAMPH.0100-30, 5CAMPH.0150-30, 5CAMPH.0200-30

Attachment cables establish the electrical and mechanical connection between the control cabinet and the device. They contain the lines for the network (Ethernet 10/100 Mbit/s) as well as for the control devices and 24 VDC supply.



General information	5CAMPH.0018-30	5CAMPH.0050-30	5CAMPH.0100-30	5CAMPH.0150-30	5CAMPH.0200-30
Certification					
CE			Yes		
Cable construction	5CAMPH.0018-30	5CAMPH.0050-30	5CAMPH.0100-30	5CAMPH.0150-30	5CAMPH.0200-30
Type			Hybrid cable, 25-wire		
Supply lines					
Material			Tinned copper stranded wire		
Outer sheathing					
Material			Silicone- and halogen-free, flame-retardant PUR outer sheathing		
Cable elements					
Network			Twisted pair cable for Ethernet (10/100 Mbit/s) (4 wires, male RJ45 connector)		
Stop button			Direct connection between the stop button and monitoring device (4 wires)		
Power supply			Supply voltage +24 VDC and ground (3 wires)		
Enable switch			Direct connection between the enable switch and monitoring device (4 wires)		
Connector	5CAMPH.0018-30	5CAMPH.0050-30	5CAMPH.0100-30	5CAMPH.0150-30	5CAMPH.0200-30
Type			ODU circular connector with push-pull locking		
Electrical characteristics	5CAMPH.0018-30	5CAMPH.0050-30	5CAMPH.0100-30	5CAMPH.0150-30	5CAMPH.0200-30
Operating voltage			Max. 30 VDC		
Conductor resistance			≤30 Ω/km		
Mechanical characteristics	5CAMPH.0018-30	5CAMPH.0050-30	5CAMPH.0100-30	5CAMPH.0150-30	5CAMPH.0200-30
Dimensions					
Length	1.8 m ±0.1 m	5 m ±0.1 m	10 m ±0.1 m	15 m ±0.15 m	20 m ±0.15 m
Diameter			10 mm		
Flex radius			Min. 60 mm		
Weight			153 g/m		
Tension			Max. 140 N		

Mobile Panel cables

5CAMPC.0020-10, 5CAMPC.0020-11

A crossover control cabinet cable is required for the wiring inside the control cabinet.

The pinout of the Ethernet connector (crossover) makes it possible to connect directly to a B&R controller (e.g. X20) or to the first Ethernet interface (MDIX) on the AC808 Ethernet hub from B&R.



General information	5CAMPC.0020-10	5CAMPC.0020-11
Certification		Yes
CE		
Cable construction	5CAMPC.0020-10	5CAMPC.0020-11
Type	Crossover	Straight through
Supply lines		
Conductor resistance		≤30 Ω/km
Material		Tinned copper stranded wire
Permissible operating voltage		30 VDC
Outer sheathing		
Material		Silicone- and halogen-free, flame-retardant PUR outer sheathing
Cable elements		
Control devices	Direct connection between the control devices and monitoring device (6 wires)	
CAN	2 pairs with shielding (5 wires) (not used on the MP40/50)	
Network	Twisted pair cable for Ethernet (10/100 Mbit/s) (4 wires, male RJ45 connector)	
Serial	3 wires (not used on the MP40/50)	
Power supply	Supply voltage +24 VDC and ground (3 wires)	
Enable switch	Direct connection between the enable switch and monitoring device (6 wires) (2 wires not used on the MP 40/50)	
Connector	5CAMPC.0020-10	5CAMPC.0020-11
Type		Receptacle for push-pull locking connection
Mechanical characteristics	5CAMPC.0020-10	5CAMPC.0020-11
Dimensions		
Length		2 m ±0.05 m
Diameter		10 mm
Flex radius		Min. 60 mm
Weight		153 g/m
Tension		Max. 140 N

Connection boxes

4MPCBX.0000-00

The 4MPCBX.0000-00 connection box makes it possible to set up a configuration where a Mobile Panel 40/50 or Mobile Panel 100/200 can be operated at various system connection points while still remaining integrated in the E-stop circuit.



- Compatible for connections with Mobile Panel 40/50 and Mobile Panel 100/200 devices
- E-stop circuit not interrupted when disconnecting and connecting the Mobile Panel during operation
- IP65 protection
- Satisfies EN ISO 13849-1:2006 Category 3, Performance Level (PL) d requirements
- Circular connector with push-pull locking
- E-stop button
- Hot plug button
- Compact dimensions
- Solid

General information

Certification	
CE	Yes

Keys

Hot plug button	1 button, 2 N.C. contacts
E-stop	1 button, 2 N.C. contacts

Electrical characteristics

Nominal voltage	18 to 30 VDC
Nominal current	150 mA

Operating conditions

EN 60529 protection	IP65 (only with mounted screw plugs, an installed protective cover or with a connected Mobile Panel 40/50 or Mobile Panel 100/200 system)
---------------------	---

Environmental conditions

Temperature	
Operation	0 to 50°C
Relative humidity	
Operation	0 to 95%, non-condensing

Mechanical characteristics

Housing	
Material	GK-AlSi11Mg (gravity die casting)
Dimensions	
Width	172.5 mm
Height	158.7 mm
Depth	81.7 mm
Weight	Approx. 1600 g (without attachment cable)

Connection boxes

4MPCBX.0001-00

The 4MPCBX.0001-00 connection box makes it easy for the control cabinet cable to exit the control cabinet vertically, but it does not feature E-stop hot plugging functionality.



- Vertical connection of the Mobile Panel attachment cable to the control cabinet
- IP65 protection
- Compact dimensions
- Solid

General information

Certification	
CE	Yes

Keys

Hot plug button	No
E-stop	No

Operating conditions

EN 60529 protection	IP65 (only with protective cover or connected Mobile Panel 40/50 or Mobile Panel 100/200)
---------------------	---

Mechanical characteristics

Housing	
Material	GK-ALSi11Mg (gravity die casting)
Dimensions	
Width	90 mm
Height	74.2 mm
Depth	150 mm
Weight	Approx. 500 g

Box cable

5CAMPB.0100-10

A box cable establishes the electrical connection between the control cabinet and the 4MPCBX.0000-00 connection box. It includes lines for the network (Ethernet 10/100 Mbit/s), 24 VDC supply, actuator controls / E-stop and key switch or pushbutton, enable switch, serial data transfer and CAN.



General information

Certification	
CE	Yes

Cable construction

Type	Hybrid cable, 25-wire
Features	Silicone- and halogen-free
Supply lines	
Material	Tinned copper stranded wire
Permissible operating voltage	30 VDC
Outer sheathing	
Material	Flame-retardant PUR
Cable elements	
Control devices	Direct connection between the control devices and monitoring device (6 wires)
CAN	2 pairs with shielding (5 wires)
Ethernet	Twisted pair cable for Ethernet (10/100 Mbit/s) (4 wires, male RJ45 connector)
Serial	3 wires
Power supply	Supply voltage +24 VDC and ground (3 wires)
Enable switch	Direct connection between the enable switch and the monitoring device (6 wires)

Connector

Type	FA. Jacob GmbH Typ: PERFECT 50.620 M
------	--------------------------------------

Electrical characteristics

Conductor resistance	≤140 Ω/km (0.15 mm ² conductor) ≤27 Ω/km (0.75 mm ² conductor)
Insulation resistance	≤500 Ω/km

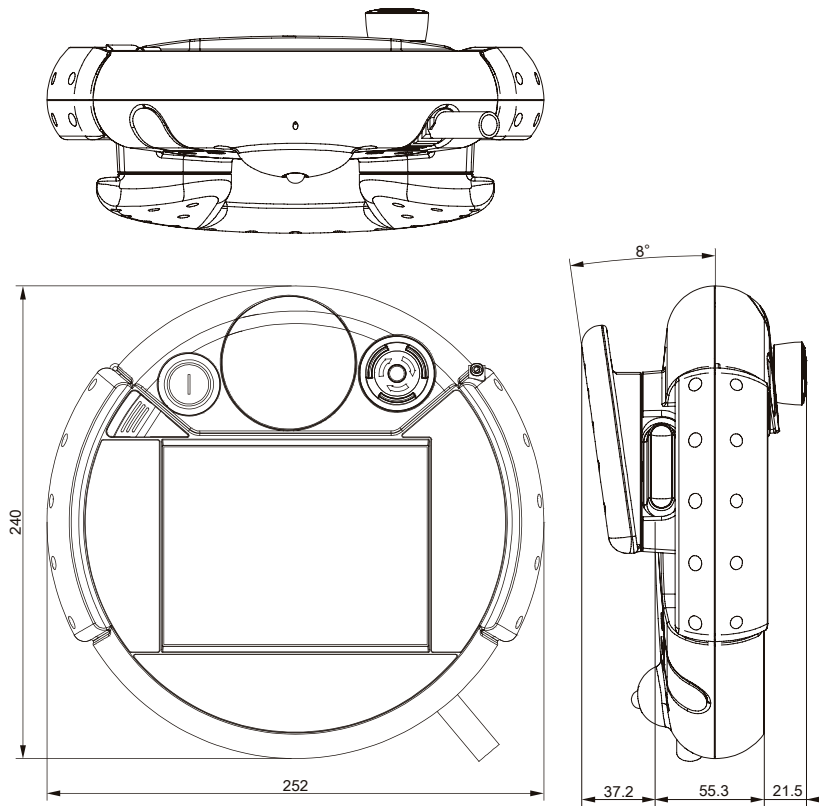
Mechanical characteristics

Dimensions	
Length	10 m ±20 cm
Diameter	10 mm
Flex radius	
Moving	60 mm
Fixed installation	30 mm
Weight	160 g/m
Tension	Max. 140 N

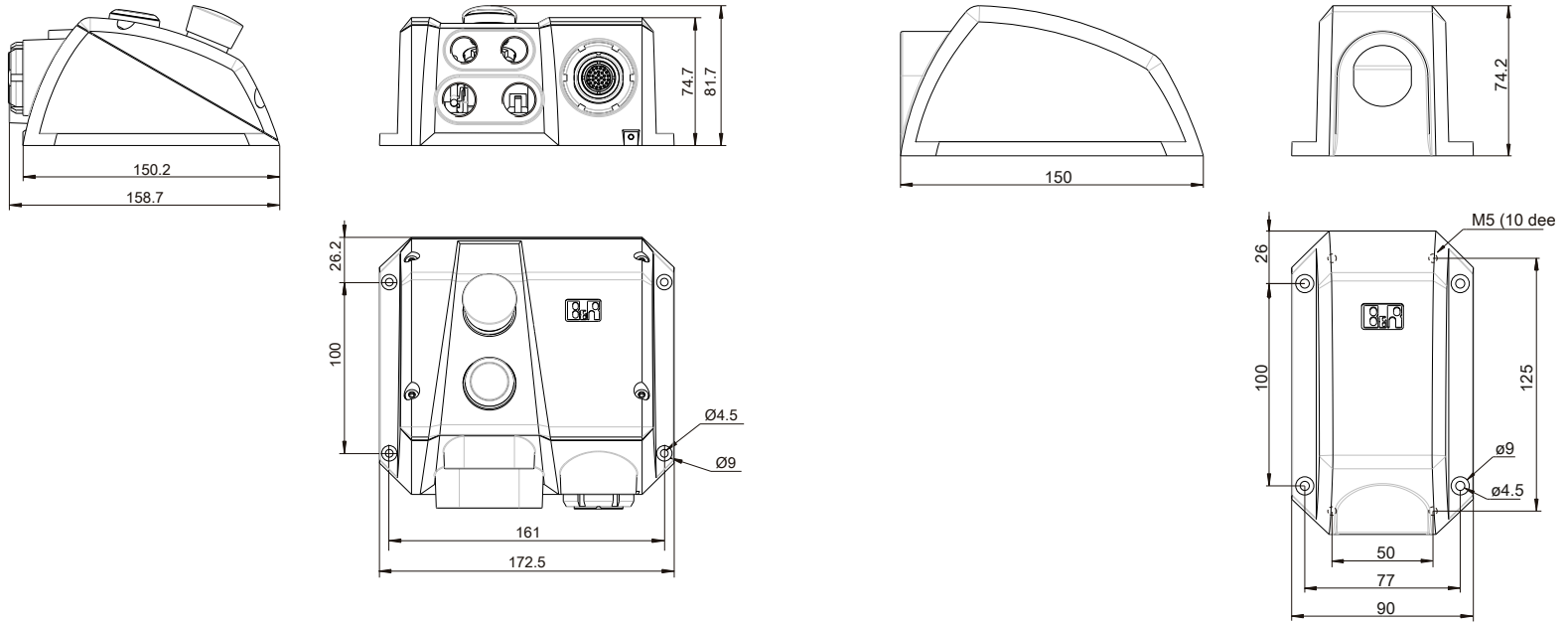
Dimensions

Control panel dimensions

Model number	Width	Height	Depth
5MP050.0653-01	252 mm	114 mm	240 mm
5MP050.0653-02	252 mm	114 mm	240 mm
5MP050.0653-03	252 mm	114 mm	240 mm
5MP050.0653-04	252 mm	114 mm	240 mm



Connection box dimensions



Model number

4MPCBX.0001-00

4MPCBX.0000-00

Width

90 mm

172.5 mm

Height

74.2 mm

158.7 mm

Depth

150 mm

81.7 mm

Industry- and customer-specific HMI systems

Industry- and customer-specific operator panels are used anytime the system must be matched perfectly to the application and its specific requirements.



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Product overview



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Corporate design

Design is becoming an increasingly important factor in the capital goods industry. Especially important is a uniform appearance across all products – the corporate identity.

In the eyes of the user, this begins with their own customized HMI system.

B&R provides four different categories for customizing display fronts, even for low order quantities.

Category A

This category allows for design modifications to existing standard B&R display units by integrating your company's logo, customized key labels, symbols and slide-in labels in addition to a complete printed overlay according to your color requirements. The advantages of Category A include full compatibility to B&R series-produced devices and quick delivery since the only thing that has to be redesigned is the panel overlay.

Category B

Also based on standard B&R display units, this category offers the same modification options as Category A, but the number and layout of keys can also be changed.

Category C

Category C display units can be completely redesigned. The dimensions of the front of the panel can be customized, with touch and display technology selected from the standard product spectrum. Additional components such as an E-stop button can also be integrated.

Category D

This category is for completely new systems with all of the options available in Categories A through C in addition to the integration of advanced technologies not included in the standard B&R product range.





Technical options

Displays:

- Character- and graphics-based LCD displays
- High-resolution color TFT LCD displays

Touch systems:

- Resistive touch screen
- Resistive touch screens with no dust-collecting edges (seamlessly sealed with the panel overlay), ideal for use in the foodstuffs and pharmaceutical industries
- Infrared touch with glass surface that offers maximum transparency and durability, glove operation and multi-touch possible
- Surface wave touch with glass surface that offers maximum resolution, transparency and durability, multi-touch possible
- Capacitive touch screen with surface or projected capacitance, multi-touch possible

Key technologies:

- Short stroke keys
- Membrane keys with integrated metallic contact elements
- B&R illuminated ring keys
- Capacitive keys
- Electromechanical actuators (E-stop, key switch, etc.)
- Encoders



Indicators:

- Integrated LEDs with various functions
- Luminous fields, B&R illuminated rings

Interfaces:

- USB, ETH

Hygienic construction

IP69K protection

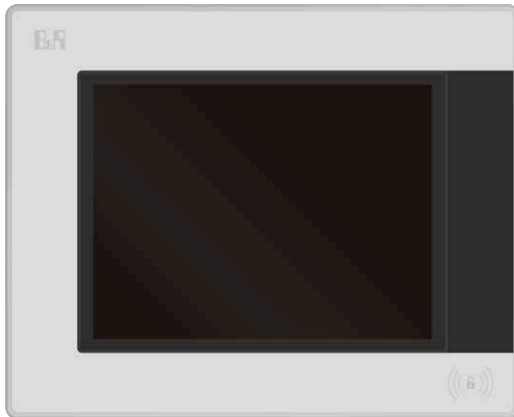
RFID read/write unit

Complete systems:

- Panel and input systems, keypads, transponders, etc. integrated in a housing and prepared for installation on a support arm system

Design:

- Photo-like printing on the front overlay



Industry-specific devices

In addition to standard operator panels, B&R also offers devices that meet the requirements unique to specific industries.

Especially in the food and beverage, pharmaceutical and packaging industries, systems must meet stringent requirements with respect to hygiene, robustness and reliability. The special construction of B&R's products ensures that they do.

B&R stainless steel excellence

B&R has developed a device series that is perfectly suited for use in the foodstuffs, pharmaceutical and packaging industries. These devices feature a hygienic construction and use especially resistant materials such as smoothed stainless steel, a high-quality polyester membrane and special sealing materials. From simple HMI terminals to operator panels with integrated control and drive technology, from 7" displays to 19" TFT displays and even customer-specific adaptations – it's easy to assemble the right configuration for any job.

Properties:

- IP69K protection
- Unique seal design eliminates the gap between the control cabinet and the panel
- Complete safety-sealed system with 3 lip seals
- Additional mounting frame for unstable control cabinets / housings
- Non-rusting stainless steel front (1.4301)
- Fully integrated touch screen
- Minimized gaps and edges where dirt can collect
- Design satisfies DIN EN 1672-2 "Food processing machinery - Basic concepts, Part 2: Hygiene requirements"
- Protection against shattering through laminated front overlay that covers the entire surface
- Physiologically harmless materials
- Optional fully integrated RFID read/write unit



Operator panels from a single source

HMI devices are frequently enclosed in a housing that is then mounted either directly on the machine or on a support arm system. Operator panels with front-side IP66 protection can be installed without this housing.

Gaps and edges are minimized by the system's special construction that features a completely integrated touch screen and does away with a transition to the housing. This makes these systems ideal for operation in industries where easy cleaning, space efficiency, robustness and intuitive operation with a touch screen are especially important.

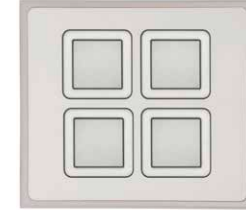
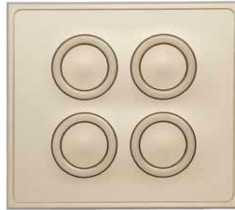
The sleek design not only makes these devices pleasing to the eye, but also allows them to be installed on a support arm system precisely where they are needed to operate the machine.

Properties:

- Robust IP65/IP69K protection
- Design satisfies DIN EN 1672-2 "Food processing machinery - Basic concepts, Part 2: Hygiene requirements"
- Fully integrated touch screen (analog resistive or projected capacitive)
- Non-rusting stainless steel housing (1.4301) with brushed surface
- Minimized gaps and edges where dirt can collect
- Protection against shattering through laminated front overlay that covers the entire surface
- Physiologically harmless materials
- Complete safety-sealed system with 3 lip seals
- IP65-rated USB port with robust stainless steel cover screw
- Optional fully integrated RFID read/write unit

Keypad modules

4XP0000.00-K20, 4XP0000.00-K40



General information	4XP0000.00-K20	4XP0000.00-K40
LED status indicators		1x Run (green), 1x Error (red)
Certification		
CE		Yes
Interfaces	4XP0000.00-K20	4XP0000.00-K40
X2X		
Design	8-pin multipoint plug	8-pin multipoint connector
Electrical isolation		No
Keys	4XP0000.00-K20	4XP0000.00-K40
Illuminated ring keys	4 pcs. (round)	4 pcs. (square)
Illuminated ring keys		
Color	red, green, yellow	Red, green, yellow
Quantity	4	-
Electrical characteristics	4XP0000.00-K20	4XP0000.00-K40
Nominal voltage		24 VDC ±25%, electrically isolated
Operating conditions	4XP0000.00-K20	4XP0000.00-K40
EN 60529 protection	IP20 back side IP65 / NEMA 250 type 4X, dust and sprayed water protection (front side)	Back: IP20 Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection
Environmental conditions	4XP0000.00-K20	4XP0000.00-K40
Temperature		
Operation		0 to +50°C
Relative humidity		
Operation		T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: <75%, non-condensing
Mechanical characteristics	4XP0000.00-K20	4XP0000.00-K40
Housing		
Material		Metal
Front		
Frame		Naturally anodized aluminum
Design	RAL 9006	Pantone 427 C
Dimensions		
Width		90 mm
Height		80 mm
Depth		37 mm
Weight		Approx. 250 g

Keypad modules

4XP0000.00-K21, 4XP0000.00-K41, 4XP0000.00-K43



General information	4XP0000.00-K21	4XP0000.00-K41	4XP0000.00-K43
LED status indicators		1x Run (green), 1x Error (red)	
Certification		Yes	
CE			
Interfaces	4XP0000.00-K21	4XP0000.00-K41	4XP0000.00-K43
X2X			
Design		8-pin multipoint connector	
Electrical isolation		No	
Keys	4XP0000.00-K21	4XP0000.00-K41	4XP0000.00-K43
Illuminated ring keys	6x B&R illuminated ring keys (round)	6x B&R illuminated ring keys (square)	6x B&R illuminated ring keys (round)
Illuminated ring keys			
Color	red, green, yellow	Red, green, yellow	2x (red, yellow, green, white) 3x (red, yellow, green) 1x (red, yellow, green, blue)
Features	4XP0000.00-K21	4XP0000.00-K41	4XP0000.00-K43
E-stop			
Type		Rafix 22FS	
Contact element		2x NC	
Electrical characteristics	4XP0000.00-K21	4XP0000.00-K41	4XP0000.00-K43
Nominal voltage		24 VDC ±25%, electrically isolated	
Operating conditions	4XP0000.00-K21	4XP0000.00-K41	4XP0000.00-K43
EN 60529 protection		Back: IP20 Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection	
Environmental conditions	4XP0000.00-K21	4XP0000.00-K41	4XP0000.00-K43
Temperature			
Operation		0 to +50°C	
Relative humidity			
Operation		T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: <75%, non-condensing	
Mechanical characteristics	4XP0000.00-K21	4XP0000.00-K41	4XP0000.00-K43
Housing			
Material		Metal	
Front			
Frame		Naturally anodized aluminum	
Design	RAL 9006	Pantone 427 C	RAL 9006
Dimensions			
Width		170 mm	
Height		80 mm	
Depth		32 mm	
Weight		430 g	

4XP0000.00-K42



General information

LED status indicators	1x Run (green), 1x Error (red)
Certification	
CE	Yes

Interfaces

X2X	
Design	8-pin male multipoint connector
Electrical isolation	No

Keys

Illuminated ring keys	6x B&R illuminated ring keys
Illuminated ring keys	
Color	Red, green, white, yellow

Electrical characteristics

Nominal voltage	24 VDC \pm 25%, electrically isolated
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Operating conditions

EN 60529 protection	Back: IP20 Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection
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Environmental conditions

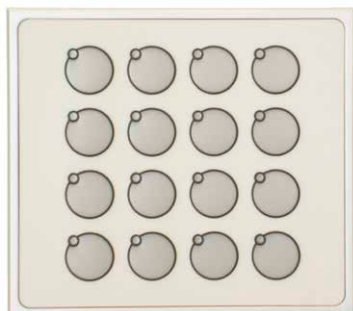
Temperature	
Operation	0 to +50°C
Relative humidity	
Operation	T \leq 40°C: 5 to 90%, non-condensing T > 40°C: <75%, non-condensing

Mechanical characteristics

Housing	
Material	Metal
Front	
Frame	Naturally anodized aluminum
Design	RAL 9006
Dimensions	
Width	212 mm
Height	50 mm
Depth	34.6 mm
Weight	362 g

Keypad modules

4XP0000.00-K33



General information

LED status indicators	1x Run (green), 1x Error (red)
Certification	
CE	Yes

Interfaces

X2X	
Design	8-pin multipoint plug
Electrical isolation	No

Keys

Membrane keys	16x membrane keys, each with yellow LED
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Electrical characteristics

Nominal voltage	24 VDC \pm 25%, electrically isolated
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Operating conditions

EN 60529 protection	Back: IP20 Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection
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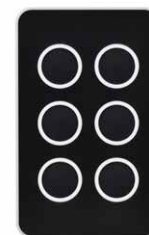
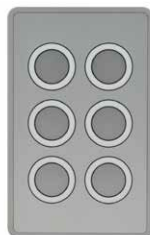
Environmental conditions

Temperature	
Operation	0 to +50°C
Relative humidity	
Operation	T \leq 40°C: 5 to 90%, non-condensing T > 40°C: <75%, non-condensing

Mechanical characteristics

Housing	
Material	Metal
Front	
Frame	Naturally anodized aluminum
Design	Pantone 427 C
Dimensions	
Width	90 mm
Height	80 mm
Depth	36.2 mm
Weight	200 g

4XP0000.00-K64, 4XP0000.00-K74, 4XP0000.00-K75



General information	4XP0000.00-K64	4XP0000.00-K74	4XP0000.00-K75
Certification			
CE		Yes	
Interfaces	4XP0000.00-K64	4XP0000.00-K74	4XP0000.00-K75
X2X			
Design	4-pin M12 connector	4-pin male M12 connector	4-pin M12 connector
Electrical isolation		Yes	
Keys	4XP0000.00-K64	4XP0000.00-K74	4XP0000.00-K75
Illuminated ring keys		6x B&R illuminated ring keys	
Illuminated ring keys			
Color		Red, green, yellow, white	
Electrical characteristics	4XP0000.00-K64	4XP0000.00-K74	4XP0000.00-K75
Nominal voltage		24 VDC ±25%, electrically isolated	
Operating conditions	4XP0000.00-K64	4XP0000.00-K74	4XP0000.00-K75
EN 60529 protection		IP65 / NEMA 250 type 4X, dust and sprayed water protection	
Environmental conditions	4XP0000.00-K64	4XP0000.00-K74	4XP0000.00-K75
Temperature			
Operation		0 to +50°C	
Relative humidity			
Operation		T ≤ 40°C: 5 to 85%, non-condensing T > 40°C: <75%, non-condensing	
Mechanical characteristics	4XP0000.00-K64	4XP0000.00-K74	4XP0000.00-K75
Housing			
Material		Sheet metal, galvanized	
Front			
Frame		Naturally anodized aluminum	
Design	RAL 9006	RAL 9005	RAL 9005, glossy finish
Dimensions			
Width		77 mm	
Height		123 mm	
Depth		52.6 mm	
Weight		450 g	

Keypad modules

4XP0000.00-K94, 4XP0000.00-KA4, 4XP0000.00-K76



General information	4XP0000.00-K94	4XP0000.00-KA4	4XP0000.00-K76
Certification		Yes	
CE			
Interfaces	4XP0000.00-K94	4XP0000.00-KA4	4XP0000.00-K76
X2X			
Design	4-pin M12 connector	4-pin M12 plug	4-pin M12 connector
Electrical isolation		Yes	
Keys	4XP0000.00-K94	4XP0000.00-KA4	4XP0000.00-K76
Illuminated ring keys		6x B&R illuminated ring keys	
Illuminated ring keys			
Color		Red, green, yellow, white	
Features	4XP0000.00-K94	4XP0000.00-KA4	4XP0000.00-K76
E-stop			
Type		Rafix 22FS	
Contact element	2x NC	2x NC	2x N.C. contacts
Electrical characteristics	4XP0000.00-K94	4XP0000.00-KA4	4XP0000.00-K76
Nominal voltage		24 VDC ±25%, electrically isolated	
Operating conditions	4XP0000.00-K94	4XP0000.00-KA4	4XP0000.00-K76
EN 60529 protection		IP65 / NEMA 250 type 4X, dust and sprayed water protection	
Environmental conditions	4XP0000.00-K94	4XP0000.00-KA4	4XP0000.00-K76
Temperature			
Operation		0 to +50°C	
Relative humidity			
Operation		T ≤ 40°C: 5 to 85%, non-condensing T > 40°C: <75%, non-condensing	
Mechanical characteristics	4XP0000.00-K94	4XP0000.00-KA4	4XP0000.00-K76
Housing			
Material		Sheet metal, galvanized	
Front			
Frame		Naturally anodized aluminum	
Design	RAL 9006	RAL 9005	RAL 9005, glossy finish
Dimensions			
Width		77 mm	
Height		175 mm	
Depth		86 mm	
Weight		600 g	

4XP0043.00-00B, 4XP0043.00-00W



General information	4XP0043.00-00B	4XP0043.00-00W
LED status indicators		1x Run (green), 1x Error (red)
Key labels		with slide-in labels
Certification		
CE		Yes
Interfaces	4XP0043.00-00B	4XP0043.00-00W
X2X		
Design		8-pin male multipoint connector
Electrical isolation		No
Keys	4XP0043.00-00B	4XP0043.00-00W
Illuminated ring keys		3x B&R illuminated ring keys (round)
Illuminated ring keys		
Color		4-color illumination; green, yellow, red, white (2 keys) / green, yellow, red, blue (1 key)
Electrical characteristics	4XP0043.00-00B	4XP0043.00-00W
Nominal voltage		24 VDC ±25%, electrically isolated
Operating conditions	4XP0043.00-00B	4XP0043.00-00W
EN 60529 protection		Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection Back: IP20
Environmental conditions	4XP0043.00-00B	4XP0043.00-00W
Temperature		
Operation		0 to +50°C
Relative humidity		
Operation		T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: <75%, non-condensing
Mechanical characteristics	4XP0043.00-00B	4XP0043.00-00W
Housing		
Material		Plastic
Front		
Frame		Plastic
Dimensions		
Width		140 mm
Height		52 mm
Depth		40.4 mm
Weight		116 g

Keypad modules

4XP0057.00-00B, 4XP0057.00-00W



General information	4XP0057.00-00B	4XP0057.00-00W
LED status indicators		1x Run (green), 1x Error (red)
Key labels		with slide-in labels
Certification		
CE		Yes
Interfaces	4XP0057.00-00B	4XP0057.00-00W
X2X		
Design		8-pin male multipoint connector
Electrical isolation		No
Keys	4XP0057.00-00B	4XP0057.00-00W
Illuminated ring keys		5x B&R illuminated ring keys (round)
Illuminated ring keys		
Color		4-color illumination; green, yellow, red, white (4 keys) / green, yellow, red, blue (1 key)
Electrical characteristics	4XP0057.00-00B	4XP0057.00-00W
Nominal voltage		24 VDC ±25%, electrically isolated
Operating conditions	4XP0057.00-00B	4XP0057.00-00W
EN 60529 protection		Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection Back: IP20
Environmental conditions	4XP0057.00-00B	4XP0057.00-00W
Temperature		
Operation		0 to +50°C
Relative humidity		
Operation		T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: <75%, non-condensing
Mechanical characteristics	4XP0057.00-00B	4XP0057.00-00W
Housing		
Material		Plastic
Front		
Frame		Plastic
Dimensions		
Width		172 mm
Height		52 mm
Depth		40.4 mm
Weight		134 g

4XP0070.00-00B, 4XP0070.00-00W



General information	4XP0070.00-00B	4XP0070.00-00W
LED status indicators	1x Run (green), 1x Error (red)	
Key labels	with slide-in labels	
Certification	Yes	
CE	Yes	
Interfaces	4XP0070.00-00B	4XP0070.00-00W
X2X	8-pin male multipoint connector	
Design	8-pin male multipoint connector	
Electrical isolation	No	
Keys	4XP0070.00-00B	4XP0070.00-00W
Illuminated ring keys	5x B&R illuminated ring keys (round)	
Illuminated ring keys	4-color illumination; green, yellow, red, white (4 keys) / green, yellow, red, blue (1 key)	
Color	4-color illumination; green, yellow, red, white (4 keys) / green, yellow, red, blue (1 key)	
Electrical characteristics	4XP0070.00-00B	4XP0070.00-00W
Nominal voltage	24 VDC ±25%, electrically isolated	
Operating conditions	4XP0070.00-00B	4XP0070.00-00W
EN 60529 protection	Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection Back: IP20	
Environmental conditions	4XP0070.00-00B	4XP0070.00-00W
Temperature	0 to +50°C	
Operation	0 to +50°C	
Relative humidity	T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: <75%, non-condensing	
Operation	T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: <75%, non-condensing	
Mechanical characteristics	4XP0070.00-00B	4XP0070.00-00W
Housing	Plastic	
Material	Plastic	
Front	Plastic	
Frame	Plastic	
Dimensions		
Width	197 mm	
Height	52 mm	
Depth	40.4 mm	
Weight	147 g	

Keypad modules

4XP0101.00-00B, 4XP0101.00-00W



General information	4XP0101.00-00B	4XP0101.00-00W
LED status indicators		1x Run (green), 1x Error (red)
Key labels		with slide-in labels
Certification		
CE		Yes
Interfaces	4XP0101.00-00B	4XP0101.00-00W
X2X		
Design		8-pin male multipoint connector
Electrical isolation		No
Keys	4XP0101.00-00B	4XP0101.00-00W
Illuminated ring keys		8x B&R illuminated ring keys (round)
Illuminated ring keys		
Color		4-color illumination; green, yellow, red, white (7 keys) / green, yellow, red, blue (1 key)
Electrical characteristics	4XP0101.00-00B	4XP0101.00-00W
Nominal voltage		24 VDC ±25%, electrically isolated
Operating conditions	4XP0101.00-00B	4XP0101.00-00W
EN 60529 protection		Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection Back: IP20
Environmental conditions	4XP0101.00-00B	4XP0101.00-00W
Temperature		
Operation		0 to +50°C
Relative humidity		
Operation		T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: <75%, non-condensing
Mechanical characteristics	4XP0101.00-00B	4XP0101.00-00W
Housing		
Material		Plastic
Front		
Frame		Plastic
Dimensions		
Width		276 mm
Height		52 mm
Depth		40.4 mm
Weight		200 g

5AP920.1906-K03



General information

Certification	
CE	Yes
cULus	Yes

Interfaces

USB ¹⁾	
Quantity	3
Type	USB 2.0 ²⁾

Display

Type	Color TFT
Display size	19" (482 mm)
Colors	16.7 million
Resolution	SXGA, 1280 x 1024 pixels
Contrast	600:1
Touch screen	
Technology	Analog, resistive

Keys

Function keys	No
Soft keys	No
System keys	No

Electrical characteristics

Nominal voltage	24 VDC $\pm 25\%$
Nominal current	Max. 3.2 A ³⁾

Operating conditions

EN 60529 protection	Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection Back: IP20 (only with an inserted Automation Panel Link card)
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Environmental conditions

Temperature	
Operation	0 to 40°C

Mechanical characteristics

Housing	
Material	Metal
Dimensions	
Width	527 mm
Height	421 mm
Depth	68 mm

¹⁾ USB devices can only be connected to the Automation Panel directly (i.e. without a hub).

²⁾ Depends on the transmission technology, the transfer distance and the Automation Panel Link insert card being used.

³⁾ The specified value applies to Automation Panel devices with an inserted Automation Panel Link card.

Automation Panel

5AP920.1906-K07



General information

Certification	
CE	Yes
cULus	Yes

Interfaces

USB ¹⁾	
Quantity	3
Type	USB 2.0 ²⁾

Display

Type	Color TFT
Display size	19" (482 mm)
Colors	16.7 million
Resolution	SXGA, 1280 x 1024 pixels
Contrast	600:1
Touch screen	
Technology	Elo Intellitouch

Keys

Function keys	No
Soft keys	No
System keys	No

Electrical characteristics

Nominal voltage	24 VDC $\pm 25\%$
Nominal current	Max. 3.2 A ³⁾

Operating conditions

EN 60529 protection	Front: IP54, protection from dust and sprayed water Back: IP20 (only with an inserted Automation Panel Link card)
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Environmental conditions

Temperature	
Operation	0 to 40°C

Mechanical characteristics

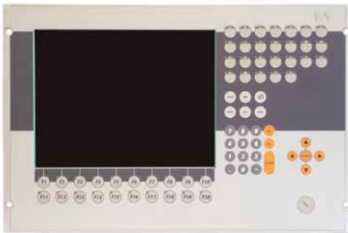
Housing	
Material	Metal
Dimensions	
Width	527 mm
Height	421 mm
Depth	55 mm

¹⁾ USB devices can only be connected to the Automation Panel directly (i.e. without a hub).

²⁾ Depends on the transmission technology, the transfer distance and the Automation Panel Link insert card being used.

³⁾ The specified value applies to Automation Panel devices with an inserted Automation Panel Link card.

5AP980.1214-K04



General information

Certification	
CE	Yes
cULus	Yes

Interfaces

USB ¹⁾	
Quantity	3
Type	USB 2.0 ²⁾

Display

Type	Color TFT
Display size	12.1" (307 mm)
Colors	262,144
Resolution	SVGA, 800 x 600 pixels
Contrast	300:1
Touch screen	
Technology	Analog, resistive

Keys

Function keys	6 (1 with LED)
Soft keys	20 (with LED)
System keys	26x alphanumeric keys, 15x numeric keys, 4x cursor block

Electrical characteristics

Nominal voltage	24 VDC $\pm 25\%$
Nominal current	Max. 3.2 A ³⁾

Operating conditions

EN 60529 protection	Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection Back: IP20 (only with an inserted Automation Panel Link card)
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Environmental conditions

Temperature	
Operation	0 to 50°C

Mechanical characteristics

Housing	
Material	Metal
Dimensions	
Width	482.6 mm
Height	310.4 mm
Depth	50.2 mm

¹⁾ USB devices can only be connected to the Automation Panel directly (i.e. without a hub).

²⁾ Depends on the transmission technology, the transfer distance and the Automation Panel Link insert card being used.

³⁾ The specified value applies to Automation Panel devices with an inserted Automation Panel Link card.

Automation Panel

5AP980.1505-B10



General information

Certification	
CE	Yes
cULus	Yes

Interfaces

USB ¹⁾	
Quantity	3
Type	USB 2.0 ²⁾
RFID read/write transponder unit	
Type	For I-Code SLI transponder with amplitude modulation, carrier frequency 13.56 MHz
Read/Write range in air	Approx. 1 to 3 cm

Display

Type	Color TFT
Display size	15" (381 mm)
Colors	16 million
Resolution	SVGA, 1024 x 768 pixels
Contrast	400:1
Touch screen ³⁾	
Technology	Analog, resistive

Keys

Soft keys	10 mm snap-action disks 107 (8 with yellow status LED)
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Features

Pushbuttons	
Quantity	2x
Front ring	Metal-plated
Selector switches	
Quantity	1
Evaluation	AP matrix (one button each for left rotation, right rotation and keystroke)
Limits	7 positions
Key switches	
Quantity	1x
Contact element	2x N.O. contact
E-stop	
Type	RAFIX 22 FS 1.30.253.502/0300
Contact element	2x N.C., 1x N.O.
Rotary encoder	
Quantity	1x
Type	Rotary pulse switch with button function

Inserts

Compatible installation for PPC300 insert	No
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Electrical characteristics

Nominal voltage	24 VDC \pm 25%
Nominal current	Max. 3.2 A ⁴⁾

Operating conditions

EN 60529 protection	Front: IP65 / NEMA 250 type 4X indoor, dust and sprayed water protection Back: IP20 (only with an inserted Automation Panel Link card)
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Environmental conditions

Temperature	
Operation	0 to 50°C

5AP980.1505-B10

Mechanical characteristics

Housing

Material	Metal
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Dimensions

Width	331 mm
Height	649.8 mm
Depth	108 mm

¹⁾ USB devices can only be connected to the Automation Panel directly (i.e. without a hub).

²⁾ Depends on the transmission technology, the transfer distance and the Automation Panel Link insert card being used.

³⁾ Touch screen drivers for approved operating systems are available in the Downloads section of the B&R website.

⁴⁾ The specified value applies to Automation Panel devices with an inserted Automation Panel Link card.

Stainless steel Automation Panel

5AP920.1043-K04



General information

Certification	
CE	Yes
cULus	Yes

Interfaces

USB ¹⁾	
Quantity	1
Type	USB 2.0 ²⁾

Display

Type	Color TFT
Display size	10.4" (264 mm)
Colors	262,144
Resolution	VGA, 640 x 480 pixels
Contrast	300:1
Touch screen	
Technology	Analog, resistive (without dirt-collecting edges)

Keys

Function keys	No
Soft keys	No
System keys	No

Electrical characteristics

Nominal voltage	24 VDC $\pm 25\%$
Nominal current	Max. 3.2 A ³⁾

Operating conditions

Suitable for hygienic applications	Yes
EN 60529 protection	Front: IP69K / NEMA 4X Back: IP20 (only with an inserted Automation Panel Link card)

Environmental conditions

Temperature	
Operation	0 to +50°C

Mechanical characteristics

Housing	
Material	Coated metal
Dimensions	
Width	330 mm
Height	267 mm
Depth	66.7 mm

¹⁾ USB devices can only be connected to the Automation Panel directly (i.e. without a hub).

²⁾ Depends on the transmission technology, the transfer distance and the Automation Panel Link insert card being used.

³⁾ The specified value applies to Automation Panel devices with an inserted Automation Panel Link card.

5AP920.1505-K54, 5AP920.1505-K74



General information	5AP920.1505-K54	5AP920.1505-K74
Certification		
CE		Yes
cULus		Yes
Interfaces	5AP920.1505-K54	5AP920.1505-K74
USB ¹⁾		
Quantity		2
Type		USB 2.0 ²⁾
RFID read/write transponder unit		
Type	-	For 4102 and 4150 transponders with amplitude modulation, carrier frequency 125 kHz
Read/Write range in air	-	Min. 16 mm
Display	5AP920.1505-K54	5AP920.1505-K74
Type	Color TFT	Color TFT
Display size		15" (381 mm)
Colors		16.7 million
Resolution		XGA, 1024 x 768 pixels
Contrast		400:1
Touch screen		
Technology		Analog, resistive (without dirt-collecting edges)
Keys	5AP920.1505-K54	5AP920.1505-K74
Function keys		No
Soft keys		No
System keys		No
Electrical characteristics	5AP920.1505-K54	5AP920.1505-K74
Nominal voltage		24 VDC ±25%
Nominal current	Max. 3.2 A ³⁾	Max. 1.5 A ³⁾
Operating conditions	5AP920.1505-K54	5AP920.1505-K74
Suitable for hygienic applications		Yes
EN 60529 protection		Front: IP69K / NEMA 4X Back: IP20 (only with an inserted Automation Panel Link card)
Environmental conditions	5AP920.1505-K54	5AP920.1505-K74
Temperature		
Operation		0 to 50°C
Mechanical characteristics	5AP920.1505-K54	5AP920.1505-K74
Housing		
Material		Metal
Dimensions		
Width	435 mm	445 mm
Height		330 mm
Depth		64 mm

¹⁾ USB devices can only be connected to the Automation Panel directly (i.e. without a hub).

²⁾ Depends on the transmission technology, the transfer distance and the Automation Panel Link plug-in card being used.

³⁾ The specified value applies to Automation Panel devices with an inserted Automation Panel Link card.

Stainless steel Automation Panel

5AP920.1505-K04, 5AP920.1505-K24, 5AP920.1505-K34, 5AP920.1505-K94



General information	5AP920.1505-K04	5AP920.1505-K24	5AP920.1505-K34	5AP920.1505-K94
Certification				
CE			Yes	
cULus			Yes	
Interfaces	5AP920.1505-K04	5AP920.1505-K24	5AP920.1505-K34	5AP920.1505-K94
USB ¹⁾				
Quantity			3	
Type			USB 2.0 ²⁾	
Display	5AP920.1505-K04	5AP920.1505-K24	5AP920.1505-K34	5AP920.1505-K94
Type			Color TFT	
Display size			15" (381 mm)	
Colors			16.7 million	
Resolution			XGA, 1024 x 768 pixels	
Contrast			400:1	
Touch screen				
Technology	Analog, resistive (without dirt-collecting edges)	Analog, resistive	Analog, resistive (without dirt-collecting edges)	Analog, resistive (without dirt-collecting edges)
Keys	5AP920.1505-K04	5AP920.1505-K24	5AP920.1505-K34	5AP920.1505-K94
Function keys			No	
Soft keys			No	
System keys			No	
Electrical characteristics	5AP920.1505-K04	5AP920.1505-K24	5AP920.1505-K34	5AP920.1505-K94
Nominal voltage			24 VDC ±25%	
Nominal current			Max. 3.2 A ³⁾	
Operating conditions	5AP920.1505-K04	5AP920.1505-K24	5AP920.1505-K34	5AP920.1505-K94
Suitable for hygienic applications	Yes	-	Satisfies hygienic requirements in accordance with DIN EN 1672-2	Yes
EN 60529 protection	Front: IP66 Back: IP65 (only with flange installed)	Entire device: IP65 / NEMA 250 type 4X protection against dust and sprayed water (on the back only if flange installed)	Front: IP66 Back: IP65 (only with flange installed)	Front: IP66 Back: IP65 (only with flange installed)
Environmental conditions	5AP920.1505-K04	5AP920.1505-K24	5AP920.1505-K34	5AP920.1505-K94
Temperature				
Operation			0 to 45°C	
Mechanical characteristics	5AP920.1505-K04	5AP920.1505-K24	5AP920.1505-K34	5AP920.1505-K94
Housing				
Material	Stainless steel, intended for the use of a flange (Rittal CP 6664.000)	Stainless steel, intended for use with a flange (Rittal CP 6664.000)	Stainless steel, intended for use with a flange (Rose GTH 48)	Stainless steel, intended for use with a flange (Rittal CP-S) and keyboard tray (5A9000.61)
Dimensions				
Width			420 mm	
Height			344 mm	
Depth			71.5 mm	

¹⁾ USB devices can only be connected to the Automation Panel directly (i.e. without a hub).

²⁾ Depends on the transmission technology, the transfer distance and the Automation Panel Link insert card being used.

³⁾ The specified value applies to Automation Panel devices with an inserted Automation Panel Link card.

5AP920.1906-K24



General information

Certification	
CE	Yes
cULus	Yes

Interfaces

USB ¹⁾	
Quantity	2
Type	USB 2.0 ²⁾

Display

Type	Color TFT
Display size	19" (482 mm)
Colors	16.7 million
Resolution	SXGA, 1280 x 1024 pixels
Contrast	600:1
Touch screen	
Technology	Analog, resistive (without dirt-collecting edges)

Keys

Function keys	No
Soft keys	No
System keys	No

Electrical characteristics

Nominal voltage	24 VDC $\pm 25\%$
Nominal current	Max. 3.2 A ³⁾

Operating conditions

Suitable for hygienic applications	Yes
EN 60529 protection	Back: IP20 (only with an inserted Automation Panel Link card) Front: IP65 / NEMA 250 type 4X, dust and sprayed water protection

Environmental conditions

Temperature	
Operation	0 to 40°C

Mechanical characteristics

Housing	
Material	Metal
Dimensions	
Width	476.9 mm
Height	390.3 mm
Depth	57.7 mm

¹⁾ USB devices can only be connected to the Automation Panel directly (i.e. without a hub).

²⁾ Depends on the transmission technology, the transfer distance and the Automation Panel Link plug-in card being used.

³⁾ The specified value applies to Automation Panel systems with an inserted Automation Panel Link card.

Stainless steel Automation Panel

5AP920.1906-K14, 5AP920.1906-K34



General information	5AP920.1906-K14	5AP920.1906-K34
Certification		
CE		Yes
cULus		Yes
Interfaces	5AP920.1906-K14	5AP920.1906-K34
USB ¹⁾		
Quantity		3 (1x back, 2x inside)
Type	USB 2.0 ²⁾	USB 2.0 ³⁾
Display	5AP920.1906-K14	5AP920.1906-K34
Type		Color TFT
Display size		19" (482 mm)
Colors		16.7 million
Resolution		SXGA, 1280 x 1024 pixels
Contrast		900:1
Touch screen		
Technology		Analog, resistive (without dirt-collecting edges)
Keys	5AP920.1906-K14	5AP920.1906-K34
Function keys		No
Soft keys		No
System keys		No
Electrical characteristics	5AP920.1906-K14	5AP920.1906-K34
Nominal voltage		24 VDC ±25%
Nominal current	Max. 3.2 A ⁴⁾	Max. 3.2 A ⁵⁾
Operating conditions	5AP920.1906-K14	5AP920.1906-K34
Suitable for hygienic applications		Yes
EN 60529 protection		Front: IP66 Back: IP65 (only with flange installed)
Environmental conditions	5AP920.1906-K14	5AP920.1906-K34
Temperature		
Operation		0 to 40°C
Mechanical characteristics	5AP920.1906-K14	5AP920.1906-K34
Housing		
Material	Stainless steel 1.4301 brushed, intended for use with a flange (Rittal CP-S)	Stainless steel 1.4301, brushed, intended for the use of a flange (Rittal CP-S) and keyboard tray 5A9000.61
Dimensions		
Width		514 mm
Height		420 mm
Depth		78.5 mm

¹⁾ USB devices can only be connected to the Automation Panel directly (i.e. without a hub).

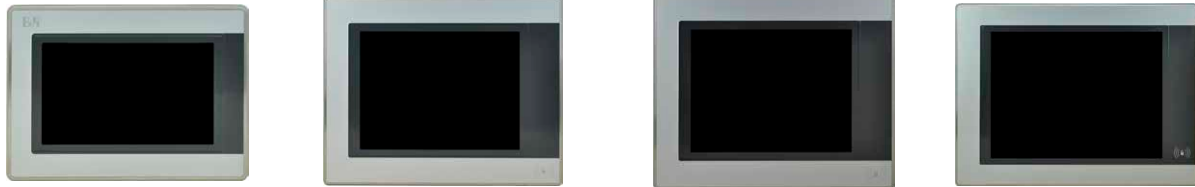
²⁾ Depends on the transmission technology, the transfer distance and the Automation Panel Link insert card being used.

³⁾ Depends on the transfer technology, the transfer distance and the Automation Panel Link insert card used.

⁴⁾ The specified value applies to Automation Panel devices with an inserted Automation Panel Link card.

⁵⁾ The listed value applies to the Automation Panel device with an inserted Automation Panel Link card.

5AP1120.0702-I00, 5AP1125.1043-I00, 5AP1125.1044-I00, 5AP1125.1505-I00



General information	5AP1120.0702-I00	5AP1125.1043-I00	5AP1125.1044-I00	5AP1125.1505-I00
Certification			Yes	
CE				
Interfaces	5AP1120.0702-I00	5AP1125.1043-I00	5AP1125.1044-I00	5AP1125.1505-I00
RFID read/write transponder unit				
Type	-	For I-Code SLI transponder, amplitude modulation and MIFARE Classic	For I-Code SLI transponder, amplitude modulation and MIFARE Classic	For I-Code SLI transponder, amplitude modulation and MIFARE Classic
Read/Write range in air	-	Approx. 1 to 3 cm	Approx. 1 to 3 cm	Approx. 1 to 3 cm
Display	5AP1120.0702-I00	5AP1125.1043-I00	5AP1125.1044-I00	5AP1125.1505-I00
Type			Color TFT	
Display size	7.0"	10.4"	10.4"	15.0"
Colors	16 million	16.2 million	16.2 million	16.2 million
Resolution	WVGA, 800 x 480 pixels	VGA, 640 x 480 pixels	SVGA, 800 x 600 pixels	XGA, 1024 x 768 pixels
Contrast	600:1	900:1	800:1	700:1
Touch screen ¹⁾				
Technology	Analog, resistive			
Operating conditions	5AP1120.0702-I00	5AP1125.1043-I00	5AP1125.1044-I00	5AP1125.1505-I00
Suitable for hygienic applications	Yes	Yes	Yes	-
EN 60529 protection	Front: IP69K / NEMA 4X Back: IP20 (only with installed link module or installed system unit)			
Mechanical characteristics	5AP1120.0702-I00	5AP1125.1043-I00	5AP1125.1044-I00	5AP1125.1505-I00
Dimensions				
Width	217 mm	321 mm	321 mm	433 mm
Height	161 mm	261 mm	261 mm	331 mm

¹⁾ Touch screen drivers for approved operating systems are available in the Downloads section of the B&R website.

Stainless steel Automation Panel

5AP93D.185B-B62, 5AP93D.240C-B62



General information	5AP93D.185B-B62	5AP93D.240C-B62
Certification		Yes
CE		
Display	5AP93D.185B-B62	5AP93D.240C-B62
Type		Color TFT
Display size	18.5"	24.0"
Colors		16.7 million
Resolution	HD, 1366 × 768 pixels	Full HD, 1920 × 1080 pixels
Contrast	1000:1	5000:1
Touch screen	Projected capacitive touch (PCT) (with shatter protection)	
Technology		
Operating conditions	5AP93D.185B-B62	5AP93D.240C-B62
Suitable for hygienic applications		Yes
EN 60529 protection	Back: IP66 (only with flange installed) Front: IP69K ¹⁾	Back: IP66 (only with flange installed) Front: IP69K ¹⁾
Mechanical characteristics	5AP93D.185B-B62	5AP93D.240C-B62
Housing	Stainless steel, intended for use with a flange (Rittal CP-S stainless steel; CP6664.500 or CP6664.000)	
Material		
Flange output	Upper and lower	
Dimensions		
Width	507.2 mm	630.2 mm
Height	327.8 mm	396.8 mm
Depth	141.6 mm	141.91 mm

¹⁾ Under a steam jet, it is possible that the structured finish is removed from the front. This only affects how the front looks; functionality is not affected.

5AP99D.156B-B62, 5AP99D.185B-B62, 5AP99D.215C-B62



General information	5AP99D.156B-B62	5AP99D.185B-B62	5AP99D.215C-B62
Certification		Yes	
CE			
Interfaces	5AP99D.156B-B62	5AP99D.185B-B62	5AP99D.215C-B62
RFID read/write transponder unit		For I-Code SLI transponder with amplitude modulation and MIFARE Classic, carrier frequency 13.56 MHz	
Type		Approx. 1 to 3 cm	
Read/Write range in air			
Display	5AP99D.156B-B62	5AP99D.185B-B62	5AP99D.215C-B62
Type		Color TFT	
Display size	15.6"	18.5"	21.46"
Colors		16.7 million	
Resolution	HD, 1366 × 768 pixels	HD, 1366 × 768 pixels	Full HD, 1920 × 1080 pixels
Contrast	500:1	1000:1	1000:1
Touch screen		Projected capacitive touch (PCT) (with shatter protection)	
Technology			
Keys	5AP99D.156B-B62	5AP99D.185B-B62	5AP99D.215C-B62
Illuminated ring keys		5x B&R illuminated ring keys	
Illuminated ring keys			
Color	4x red, green, yellow, white 1x red, green, yellow, blue	4x red, green, yellow, white 1x red, green, yellow, blue	4x red, green, yellow, white 1x red, green, yellow, blue
Features	5AP99D.156B-B62	5AP99D.185B-B62	5AP99D.215C-B62
E-stop		Schlegel FRVK series	
Type		2x N.C. contact, 1x N.O. contact	
Contact element			
Operating conditions	5AP99D.156B-B62	5AP99D.185B-B62	5AP99D.215C-B62
Suitable for hygienic applications		Yes	
EN 60529 protection		Back: IP66 (only with flange installed) Front: IP69K ¹⁾	
Mechanical characteristics	5AP99D.156B-B62	5AP99D.185B-B62	5AP99D.215C-B62
Housing		Stainless steel, intended for use with a flange (Rittal CP-S stainless steel; CP6664.500 or CP6664.000)	
Material			
Flange output		Upper and lower	
Dimensions			
Width	446.2 mm	507.2 mm	573.7 mm
Height	333.2 mm	369.7 mm	407.7 mm
Depth	143 mm (without E-stop)	141.6 mm (without E-stop)	143 mm (without E-stop)

¹⁾ Under a steam jet, it is possible that the structured finish is removed from the front. This only affects how the front looks; functionality is not affected.

4B1270.00-K15



General information

LED status indicators	1x Run (green), 1x Error (red)
Certification	
CE	Yes

Interfaces

CAN	
Design	3-pin terminal block
Electrical isolation	Yes

Display

Type	LCD
Resolution	4 x 20 characters
Display character set	English / Katakana
Brightness	250 cd/m ²

Keys

E-stop	2 normally closed
Enable switch	2x normally open
Type	Membrane keys
Quantity	24

Electrical characteristics

Nominal voltage	24 VDC ±25%
Current consumption	Min. 40 mA (without backlight) Typ. 65 mA Max. 80 mA

Operating conditions

EN 60529 protection	IP65 / NEMA 250 type 4X, dust and sprayed water protection
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Environmental conditions

Temperature	
Operation	0 to 50°C
Relative humidity	
Operation	T ≤ 40°C: 5 to 90%, non-condensing T > 40°C: 5 to 75%, non-condensing

Mechanical characteristics

Housing	
Material	Polyamide
Front	
Frame	Polyamide
Design	B&R standard
Dimensions	
Width	116 mm
Height	226 mm
Depth	66 mm
Weight	500 g

RFID read/write unit

5E9020.29



General information

Certification	
CE	Yes

Interfaces

USB	
Type	USB 2.0
RFID read/write transponder unit	
Type	For I-Code SLI transponder with amplitude modulation and MIFARE classic, carrier frequency 13.56 MHz
Read/Write range in air	Approx. 1 to 3 cm

Electrical characteristics

Supply voltage	5 VDC \pm 20% (via USB)
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Operating conditions

EN 60529 protection	IP65
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Environmental conditions

Temperature	
Operation	0 to 50°C

Mechanical characteristics

Dimensions	
Width	34 mm
Height	34 mm
Depth	60 mm

5A9000.61



General information

Short description	Keyboard tray for stainless steel devices
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Certification	
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CE	
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Yes	
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Mechanical characteristics

Material	Brushed stainless steel
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Dimensions	
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Width	
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420 mm	
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Height	
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280 mm	
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5A9000.69



Short description

Accessories	5AC900.1100-00 (MP100/200 touch screen stylus pen, 5 pcs.); 5AC900.1100-01 (MP40/50 touch screen stylus pen, 5 pcs.); 5AC900.1100-K02 (MP100/200 touch screen stylus pen, 1 pc.); 5AC900.1100-K03 (MP40/50 touch screen stylus pen, 1 pc.)
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General information

Short description	Touch screen stylus pen holder
Certification	
CE	Yes

Mechanical characteristics

Material	Anodized aluminum
Dimensions	
Width	24.5 mm
Height	66 mm
Depth	13.6 mm



PC software

Operating systems

To complement its extensive array of industrial PCs, B&R offers a variety of Windows operating systems.

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Windows Embedded 8.1 Industry Pro



With Windows Embedded 8.1 Industry Pro, Microsoft's latest operating system can now also be used for industrial applications. As the ideal basis for HMI applications with touch screen capabilities, it also offers additional possibilities that increase system security.

B&R supports Windows 8 in the form of Windows Embedded 8.1 Industry Pro, a system tailored specifically to industrial applications. Based on the full version of Windows 8.1 Professional, which ensures that all applications and drivers are compatible, this new Windows technology combines embedded system characteristics such as additional lockdown functions to make industrial PCs more secure. And like Windows 8.1, Windows Embedded 8.1 Industry Pro offers improved touch screen support for an intuitive user interface.

Windows Embedded 8.1 Industry Pro supports the following languages:

- Arabic
- Bulgarian
- Chinese (Simplified)
- Chinese (Taiwan)
- Chinese (Traditional)
- Danish
- German
- English
- Estonian
- Finnish
- French
- Greek
- Hebrew
- Dutch
- Italian
- Japanese
- Korean
- Croatian
- Latvian
- Lithuanian
- Norwegian
- Polish
- Portuguese (Brazil)
- Portuguese (Portugal)
- Romanian
- Russian
- Swedish
- Serbian
- Slovakian
- Slovenian
- Spanish
- Czech
- Thai
- Turkish
- Ukrainian
- Hungarian

Model number	Edition	Target system	Chipset	Architecture	Language	Minimum disk size	Minimum RAM required
5SWWI8.0340-MUL	Embedded	APC910	QM77 HM76	32-bit	Multilingual	16 GB ¹⁾	1 GB ²⁾
5SWWI8.0440-MUL	Embedded	APC910	QM77 HM76	64-bit	Multilingual	20 GB ¹⁾	2 GB ³⁾
5SWWI8.0341-MUL	Embedded	PPC900	QM77 HM76	32-bit	Multilingual	16 GB ¹⁾	1 GB ²⁾
5SWWI8.0441-MUL	Embedded	PPC900	QM77 HM76	64-bit	Multilingual	20 GB ¹⁾	2 GB ³⁾
5SWWI8.0342-MUL	Embedded	APC2100	Bay Trail	32-bit	Multilingual	16 GB ¹⁾	1 GB ²⁾
5SWWI8.0442-MUL	Embedded	APC2100	Bay Trail	64-bit	Multilingual	20 GB ¹⁾	2 GB ³⁾
5SWWI8.0343-MUL	Embedded	PPC2100	Bay Trail	32-bit	Multilingual	16 GB ¹⁾	1 GB ²⁾
5SWWI8.0443-MUL	Embedded	PPC2100	Bay Trail	64-bit	Multilingual	20 GB ¹⁾	2 GB ³⁾

¹⁾ The memory used by additional language packs is not taken into account in the minimum size specified for the disk.

²⁾ With an active UWF (Unified Write Filter), 2 GB RAM are recommended.

The specified size is the minimum requirement according to Microsoft. B&R recommends, however, using 2 GB or more of RAM with 32-bit operating systems.

³⁾ The specified size is the minimum requirement according to Microsoft. B&R recommends, however, using 4 GB or more of RAM with 64-bit operating systems.

Windows 7 Professional and Ultimate



Windows 7 offers a wealth of innovative features and performance improvements. Fast switching to power saving mode, quick restores, low memory usage and high-speed detection of USB devices are just a few of the advantages provided by Windows 7. Both English and German are available in Windows 7 Professional, while Windows 7 Ultimate supports up to 35 different languages. Product activation is not necessary on B&R PCs, which is a huge advantage for simple logistical procedures relating to machine automation.

Windows 7 Ultimate supports the following languages:

- Arabic
- Bulgarian
- Chinese (Simplified)
- Chinese (Taiwan)
- Chinese (Traditional)
- Danish
- German
- English
- Estonian
- Finnish
- French
- Greek
- Hebrew
- Dutch
- Italian
- Japanese
- Korean
- Croatian
- Latvian
- Lithuanian
- Norwegian
- Polish
- Portuguese (Brazil)
- Portuguese (Portugal)
- Romanian
- Russian
- Swedish
- Serbian
- Slovakian
- Slovenian
- Spanish
- Czech
- Thai
- Turkish
- Ukrainian
- Hungarian

Model number	Edition	Target system	Chipset	Service pack	Architecture	Language	Minimum hard disk space required	Minimum RAM required
5SWWI7.1100-ENG	Professional	APC910 APC2100 PPC900 PPC2100	QM77/HM76 Bay Trail	SP1	32-bit	English	16 GB	1 GB ¹⁾
5SWWI7.1100-GER	Professional	APC910 APC2100 PPC900 PPC2100	QM77/HM76 Bay Trail	SP1	32-bit	German	16 GB	1 GB ¹⁾
5SWWI7.1300-MUL	Ultimate	APC910 APC2100 PPC900 PPC2100	QM77/HM76 Bay Trail	SP1	32-bit	Multilingual	16 GB ²⁾	1 GB ¹⁾
5SWWI7.1200-ENG	Professional	APC910 APC2100 PPC900 PPC2100	QM77/HM76 Bay Trail	SP1	64-bit	English	20 GB	2 GB ³⁾
5SWWI7.1200-GER	Professional	APC910 APC2100 PPC900 PPC2100	QM77/HM76 Bay Trail	SP1	64-bit	German	20 GB	2 GB ³⁾
5SWWI7.1400-MUL	Ultimate	APC910 APC2100 PPC900 PPC2100	QM77/HM76 Bay Trail	SP1	64-bit	Multilingual	20 GB ²⁾	2 GB ³⁾

¹⁾ The specified size is the minimum requirement according to Microsoft. B&R recommends, however, using 2 GB or more of RAM with 32-bit operating systems.

²⁾ The memory used by additional language packs is not taken into account in the minimum size of the disk.

³⁾ The specified size is the minimum requirement according to Microsoft. B&R recommends, however, using 4 GB or more of RAM with 64-bit operating systems.

Windows Embedded Standard 7



The successor to Windows Embedded Standard 2009 is Windows Embedded Standard 7. As with previous versions, this embedded operating system offers full system support. In addition to features that are also included in Windows 7 Professional, Windows Embedded Standard 7 includes embedded components such as Enhanced Write Filter, File-Based Write Filter, Registry Filter and USB Boot. Windows Embedded Standard 7 is available in two different versions. The main difference between them has to do with multilingual support. Windows Embedded Standard 7 is only available in a single language, whereas Windows Embedded Standard 7 Premium supports the installation of several languages simultaneously. With Windows Embedded Standard 7, Microsoft has also made substantial improvements in the area of security. The AppLocker program, available in the premium version, can prevent the execution of unknown or potentially undesired applications that are being installed over a network or from drives that are directly connected. A tiered approach allows the differentiation between scripts (.ps1, .bat, .cmd, .vbs and .js), installation files (.msi, .msp) and libraries (.dll, .ocx). AppLocker can also be configured to record undesired activity and display it in the Event Viewer. Windows Embedded Standard 7 is available as both a 32-bit and 64-bit versions, which ensures that even the most demanding applications have the level of support they need.

Model number	Edition	Target system	Chipset	Service pack	Architecture	Language	Minimum disk size	Minimum RAM required
5SWWI7.1540-ENG	Embedded	APC910	QM77 HM76	SP1	32-bit	English	16 GB	1 GB ¹⁾
5SWWI7.1640-ENG	Embedded	APC910	QM77 HM76	SP1	64-bit	English	16 GB	2 GB ²⁾
5SWWI7.1740-MUL	Premium	APC910	QM77 HM76	SP1	32-bit	Multilingual	16 GB ³⁾	1 GB ¹⁾
5SWWI7.1840-MUL	Premium	APC910	QM77 HM76	SP1	64-bit	Multilingual	16 GB ³⁾	2 GB ²⁾
5SWWI7.1542-ENG	Embedded	APC2100	Bay Trail	SP1	32-bit	English	16 GB	1 GB ¹⁾
5SWWI7.1642-ENG	Embedded	APC2100	Bay Trail	SP1	64-bit	English	16 GB	2 GB ²⁾
5SWWI7.1742-MUL	Premium	APC2100	Bay Trail	SP1	32-bit	Multilingual	16 GB ³⁾	1 GB ¹⁾
5SWWI7.1842-MUL	Premium	APC2100	Bay Trail	SP1	64-bit	Multilingual	16 GB ³⁾	2 GB ²⁾
5SWWI7.1541-ENG	Embedded	PPC900	QM77 HM76	SP1	32-bit	English	16 GB	1 GB ¹⁾
5SWWI7.1641-ENG	Embedded	PPC900	QM77 HM76	SP1	64-bit	English	16 GB	2 GB ²⁾
5SWWI7.1741-MUL	Premium	PPC900	QM77 HM76	SP1	32-bit	Multilingual	16 GB ³⁾	1 GB ¹⁾
5SWWI7.1841-MUL	Premium	PPC900	QM77 HM76	SP1	64-bit	Multilingual	16 GB ³⁾	2 GB ²⁾
5SWWI7.1543-ENG	Embedded	PPC2100	Bay Trail	SP1	32-bit	English	16 GB	1 GB ¹⁾
5SWWI7.1643-ENG	Embedded	PPC2100	Bay Trail	SP1	64-bit	English	16 GB	2 GB ²⁾
5SWWI7.1743-MUL	Premium	PPC2100	Bay Trail	SP1	32-bit	Multilingual	16 GB ³⁾	1 GB ¹⁾
5SWWI7.1843-MUL	Premium	PPC2100	Bay Trail	SP1	64-bit	Multilingual	16 GB ³⁾	2 GB ²⁾

¹⁾ The specified size is the minimum requirement according to Microsoft. B&R recommends, however, using 2 GB or more of RAM with 32-bit operating systems.

²⁾ The specified size is the minimum requirement according to Microsoft. B&R recommends, however, using 4 GB or more of RAM with 64-bit operating systems.

³⁾ The memory used by additional language packs is not taken into account in the minimum size of the disk.

Windows Embedded Standard 2009



Windows Embedded Standard 2009 is the modular version of Windows XP Professional. It is used if XP applications should be executed with a minimal operating system size. Together with CompactFlash memory, Windows Embedded Standard 2009 makes it possible to use the Microsoft desktop operating system in harsh environmental conditions. In addition to the familiar features included in Windows XP Professional, Windows Embedded Standard 2009 has been improved with regard to dependability by adding a write filter for individual memory partitions. By protecting individual partitions such as the boot partition, the PC system can be started without problems even after an unexpected power failure. B&R offers complete images for industrial PCs, Power Panel and Mobile Panel devices to make the transition to Windows Embedded Standard 2009 as easy as possible. Like Windows Embedded Standard 2009, the standard Windows XP Professional operating system is also available in English, German and multilingual editions.

Model number	Target system	Chipset	Language	Minimum disk size	Minimum RAM required
5SWWXP.0740-ENG	APC910	QM77 HM76	English	2 GB	256 MB
5SWWXP.0741-ENG	PPC900	QM77 HM76	English	2 GB	256 MB

Debian 8



debian

A Linux or GNU/Linux system is an open, Unix-like multiuser operating system based on the Linux kernel and GNU software. Widespread use and commercial applications were made possible starting in 1992 with the licensing of the Linux kernel under the GPL.

The Debian 8 operating system developed by B&R already contains all of the necessary drivers for the devices and can be used immediately without additional work.

Model number	Target system	Chipset	Architecture	Language	Minimum disk size	Minimum RAM required
5SWLIN.0540-MUL	APC910	QM77 HM76	32-bit	Multilingual	4 GB	1 GB
5SWLIN.0640-MUL	APC910	QM77 HM76	64-bit	Multilingual	4 GB	1 GB
5SWLIN.0541-MUL	PPC900	QM77 HM76	32-bit	Multilingual	4 GB	1 GB
5SWLIN.0641-MUL	PPC900	QM77 HM76	64-bit	Multilingual	4 GB	1 GB
5SWLIN.0542-MUL	APC2100	Bay Trail	32-bit	Multilingual	4 GB	1 GB
5SWLIN.0642-MUL	APC2100	Bay Trail	64-bit	Multilingual	4 GB	1 GB
5SWLIN.0543-MUL	PPC2100	Bay Trail	32-bit	Multilingual	4 GB	1 GB
5SWLIN.0643-MUL	PPC2100	Bay Trail	64-bit	Multilingual	4 GB	1 GB










ACOPOSmicro

Compact drive system

The ACOPOSmicro series offers solutions with both stepper and servo motors optimized for applications with lower performance demands.

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Product overview



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Highlights

- Compact design
- Extremely versatile
- Low power loss
- Uniform design for inverter and stepper motor modules
- Optional expansions



ACOPOSmicro
With encoder interface
and heat spreader



ACOPOSmicro
with heat spreader

The ACOPOSmicro drive system

One solution for all applications

The main focus of development for the ACOPOSmicro was to provide cost-effective drive solutions that included low-end performance levels as well. Nevertheless, ACOPOSmicro's technical capabilities can still compete with larger devices. The ACOPOSmicro is designed to control both stepper motors and servo motors. Despite its small dimensions, it can support up to two axes on one module.

Flexibility

Ever-changing fields of application and the necessity to integrate different types of drives in one machine often create enormous challenges for application developers. Creating projects with B&R Automation Studio makes it possible to handle a wide range of drive concepts using the same tools. This means that flexible drive architectures can be implemented by either combining these concepts together or maintaining their independence from one another.

It is possible to plan for different machine variants as early as the project development phase and to account for separate configurations that use various drive types. This makes it easy to switch from a stepper motor to a servo motor variant (and vice versa) without problems. As a result, machine manufacturers are able to enjoy unprecedented flexibility.

Integrated I/O

In addition to trigger inputs, this system also includes a 24 VDC output. It can be used, for example, to control external brakes in addition to being available for other tasks.

If required, additional functionality can be added via optional modules at minimum cost and without taking up extra space.

This makes it possible to meet even extraordinary customer-specific requirements. Optional support of many different encoder systems, even with the stepper motor variant, illustrates the high degree of flexibility offered by this product line.

Compact dimensions

The two-channel variant of this system clearly highlights this module's extremely compact design. The ACOPOSmicro requires an area of less than 50 cm² per axis.

This not only saves space in the control cabinet for applications with multiple axes, but also provides advantages in wiring since the bus and supply voltage connection is only needed for every second motor. Such high power density in such a small space is extremely rare.

Keying and identification

The possibility of using keyed connection terminals is extremely useful, especially for the two-channel variant. In particular, this prevents serious errors that can occur by connecting the wrong drive axis during commissioning. Being able to easily label the ACOPOSmicro also helps to avoid errors.

Variable nominal voltage ranges

To achieve high torque values at high speeds, the first variant was designed for a nominal voltage of 80 VDC. The ability to withstand overvoltage up to 95 VDC also allows for increases in the DC bus voltage such as those that occur during braking procedures. Nevertheless, ACOPOSmicro drives can also be utilized in the low voltage range with nearly no limitations – even as low as 18 VDC.

ACOPOSmicro stepper motor modules

Whereas earlier stepper motors were mainly reserved for simpler tasks, today they are used to meet even complex CNC demands. The particular strength of these motors is their high level of torque in the low to middle speed range that can be implemented with even very small motor designs. Within the torque limits, this technology is a truly cost-effective solution.

Ease of handling

It goes without saying with this system that no switches are needed to select the motor current. All module settings are software-based. The default values of all parameters can be quickly and easily adapted to the project and overwritten at runtime. Being able to break current values down to approximately one percent of the nominal current makes it possible to select exactly the current that is needed. The module's main feature is that holding current, nominal current and maximum current (boost current) can each be defined separately. This keeps thermal loss in the stepper motor to a minimum, and the maximum torque is available exactly when it is needed. All of this leads to drastic energy savings and reduced power loss in the motor, further extending the service life of all components.

Maximum resolution

Depending on the stepper motor being used, the ACOPOSmicro can break a motor revolution down into 102,400 partial steps. This is possible due to the 256 microsteps supported by the system. The basic step angle is automatically divided into the maximum possible microsteps based on speed. In addition to increased positioning accuracy, this also enables much smoother operation. The common problem of accumulating resonance frequencies is significantly minimized by the ability to fine-tune the current. The high frequency of the current controller also plays a role in this. Optional encoder feedback can help stepper motors achieve highly accurate positioning under a wide range of load torques.

ACOPOSmicro inverter modules

Powerful solutions across the board

Reduced energy, service and maintenance costs thanks to a longer lifespan and fewer components per axis – all of this is made possible through the use of ACOPOSmicro inverter modules and LinMot® linear motors instead of pneumatic cylinders.

In particular, the large amount of energy required to generate compressed air due to significant energy loss (e.g. motor and compressor loss, pressure loss through reduction valves and leaks) has a negative impact on the total cost of ownership of a machine and increases the demand for electric linear axes.

Linear motors provide more precise positioning, thus improving the accuracy of repeated machine movements. Higher clock speeds – up to a factor of 2 – increase the production capacity of a plant and reduce overall production costs. Packaging machines, handling devices and pick-and-place applications are just a few examples where linear motors are replacing pneumatic cylinders, linear axes driven by servo motors, cam gears and multi-jointed applications.

In short, the integration of electrically driven linear axes into B&R's automation technology catalog opens up entirely new dimensions of flexible machine designs.

Modular cooling design

The majority of the heat generated in the device is emitted to the heat spreader integrated in the ACOPOSmicro. This heat can then be dissipated in various ways, such as through a conventional heat sink on the cooling medium of an external cold plate (water or oil-cooled) or passed on to the machine parts.

LinMot® encoder interface

A new member of the ACOPOSmicro family is the ACOPOSmicro inverter module with a LinMot® encoder interface. The combination of maximum performance in a compact space is a major highlight of this series. The footprint of the ACOPOSmicro dual axis module takes up only 100 cm² in the control cabinet, thereby allowing extremely compact multi-axis applications.

The ACOPOSmicro product family can be operated in a nominal voltage range from 18 VDC to 80 VDC. State-of-the-art semiconductors minimize heat loss and eliminate the need for elaborate and expensive cooling concepts. In addition, an intelligent power supply module with a network connection opens up completely new possibilities for diagnostics.

In addition to its 2 trigger inputs and a 24 VDC output, the ACOPOSmicro inverter module with a LinMot® encoder interface also features a POWERLINK interface. The integrated POWERLINK hub also greatly simplifies bus cabling. Configuration takes place in B&R Automation Studio and is exactly the same as for all other ACOPOS drive products.

Stepper motor modules

80SD100XS.C0XX-01, 80SD100XD.C0XX-01, 80SD100XD.C0XX-21



Short description	80SD100XS.C0XX-01	80SD100XD.C0XX-01	80SD100XD.C0XX-21
Stepper motor module	Connection for one stepper motor without encoder, 2-phase bipolar	Connection for two stepper motors without encoder, 2-phase bipolar	Connection for two stepper motors without encoder, 2-phase bipolar
General information	80SD100XS.C0XX-01	80SD100XD.C0XX-01	80SD100XD.C0XX-21
Certification			
CE		Yes	
cULus		Yes	
GOST-R		Yes	
24 VDC supply	80SD100XS.C0XX-01	80SD100XD.C0XX-01	80SD100XD.C0XX-21
Input voltage		24 VDC ±25%	
Power consumption			
CPU ¹⁾		Max. 6 W	
X2X Link supply		Generated internally from the CPU supply	
Power supply	80SD100XS.C0XX-01	80SD100XD.C0XX-01	80SD100XD.C0XX-21
Input voltage		24 to 64 VDC ±25%	
Line protection		Must be handled externally	
Motor connection	80SD100XS.C0XX-01	80SD100XD.C0XX-01	80SD100XD.C0XX-21
Quantity	1	2	2
Nominal current		10 A _{Peak}	
Max. current / motor		15 A _{Peak} (2 s)	
Max. current / module	15 A _{Peak}	30 A _{Peak}	30 A _{Peak}
Nominal switching frequency		38.5 kHz	
Max. motor line length		25 m	
Motor holding brake connection	80SD100XS.C0XX-01	80SD100XD.C0XX-01	80SD100XD.C0XX-21
Quantity		1	
Continuous current		1 A	
Max. internal resistance		0.3 Ω	
Interfaces	80SD100XS.C0XX-01	80SD100XD.C0XX-01	80SD100XD.C0XX-21
X2X			
Design		4-pin male connector	
Enable inputs	80SD100XS.C0XX-01	80SD100XD.C0XX-01	80SD100XD.C0XX-21
Quantity		1	
Input current at nominal voltage		Typ. 60 mA	
Digital inputs / Trigger inputs	80SD100XS.C0XX-01	80SD100XD.C0XX-01	80SD100XD.C0XX-21
Quantity		2	
Can be used as trigger input	1	2	2
Nominal voltage		24 VDC	
Input voltage		24 VDC ±25%	
Input current at nominal voltage		Typ. 10 mA	

80SD100XS.C0XX-01, 80SD100XD.C0XX-01, 80SD100XD.C0XX-21

Analog inputs (option board)	80SD100XS.C0XX-01	80SD100XD.C0XX-01	80SD100XD.C0XX-21
Quantity	-	-	2
Input signal	-	-	±10 V
Input type	-	-	Differential input
Digital converter resolution	-	-	±12-bit
Conversion time	-	-	50 µs for all channels
Input impedance in signal range	-	-	20 MΩ
Input protection	-	-	Protection against wiring with CPU supply voltage
Max. error at 25°C			
Gain	-	-	0.08%
Offset	-	-	0.015%
Operating conditions	80SD100XS.C0XX-01	80SD100XD.C0XX-01	80SD100XD.C0XX-21
Mounting orientation			
Vertical		Yes	
EN 60529 protection		IP20	
Environmental conditions	80SD100XS.C0XX-01	80SD100XD.C0XX-01	80SD100XD.C0XX-21
Temperature			
Operation		0 to 45°C	
Mechanical characteristics	80SD100XS.C0XX-01	80SD100XD.C0XX-01	80SD100XD.C0XX-21
Note		Order terminal blocks and cables separately	
Dimensions ²⁾			
Width		65 mm	
Height		134 mm	
Depth		95 mm	

¹⁾ Including enable input.

²⁾ Without heat spreader.

Stepper motor modules

80SD100XS.C04X-01, 80SD100XS.C04X-13, 80SD100XD.C044-01, 80SD100XD.C04X-13



Short description	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Stepper motor module	Connection for one stepper motor with ABR interface, 2-phase bipolar		Connection for two stepper motors with ABR interface, 2-phase bipolar	
General information	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Certification			Yes	
CE			Yes	
cULus			Yes	
GOST-R			Yes	
24 VDC supply	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Input voltage	24 VDC ±25%			
Power consumption	Generated internally from the CPU supply			
CPU ¹⁾	Max. 7 W	Max. 7 W	Max. 8 W	Max. 7 W
X2X Link supply				
Power supply	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Input voltage	24 to 64 VDC ±25%			
Line protection	Must be handled externally			
Motor connection	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Quantity	1	1	2	2
Nominal current			10 A _{Peak}	
Max. current / motor			15 A _{Peak} (2 s)	
Max. current / module	15 A _{Peak}	15 A _{Peak}	30 A _{Peak}	30 A _{Peak}
Nominal switching frequency			38.5 kHz	
Max. motor line length			25 m	
Motor holding brake connection	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Quantity			1	
Continuous current			1 A	
Max. internal resistance			0.3 Ω	
Interfaces	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
X2X				
Design	4-pin male connector			
Encoder inputs	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Quantity	1	1	2	1
Type	ABR single-ended signals 24 V		ABR single-ended signals 24 V	
Max. encoder cable length	25 m			
Encoder supply				
Output voltage ²⁾			24 V	
Load capability	40 mA ³⁾	40 mA ³⁾	40 mA, Important: 1 PTC for both channels ³⁾	40 mA ³⁾
Inputs A, B, R				
Switching threshold				
Low	<5 V (to COM)			
High	>15 V (to COM)			

80SD100XS.C04X-01, 80SD100XS.C04X-13, 80SD100XD.C044-01, 80SD100XD.C04X-13

Temperature measurement				
Type	KTY			
Value	0 to 110°C			
Tolerance	5%			
Incremental encoder operation	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Signal form	Square wave pulse			
Evaluation	4x			
Counter size	16-bit			
Input frequency	Max. 50 kHz			
Counter frequency	200 kHz			
Input current at nominal voltage	Typ. 4 mA			
Enable inputs	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Quantity	1			
Input current at nominal voltage	Typ. 60 mA			
Digital inputs / Trigger inputs	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Quantity	2			
Can be used as trigger input	1	1	2	2
Nominal voltage	24 VDC			
Input voltage	24 VDC ±25%			
Input current at nominal voltage	Typ. 10 mA			
Digital inputs (option board)	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Quantity	-	4	-	4
Nominal voltage	-	24 VDC	-	24 VDC
Input filter				
Hardware	-	<5 µs	-	<5 µs
Software	-			
Digital outputs (option board)	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Quantity	-	2	-	2
Nominal voltage	-	24 VDC	-	24 VDC
Connection type	-	1-wire connections	-	1-wire connections
Output circuit	-	Source	-	Source
Output protection	-	Thermal cutoff for overcurrent and short circuit	-	Thermal cutoff for overcurrent and short circuit
Max. internal resistance	-	0.3 Ω	-	0.3 Ω
Operating conditions	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Mounting orientation				
Vertical	Yes			
EN 60529 protection	IP20			
Environmental conditions	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Temperature				
Operation	0 to 45°C			
Mechanical characteristics	80SD100XS.C04X-01	80SD100XS.C04X-13	80SD100XD.C044-01	80SD100XD.C04X-13
Note	Order terminal blocks and cables separately			
Dimensions ⁴⁾				
Width	65 mm			
Height	134 mm			
Depth	95 mm			

¹⁾ Including enable input.

²⁾ Depends on the supply voltage of the CPU component.

³⁾ See "X6 - Input circuit diagram for incremental encoder"

⁴⁾ Without heat spreader.

Stepper motor modules

80SD100XD.C033-01, 80SD100XD.C011-01



Short description	80SD100XD.C033-01	80SD100XD.C011-01
Stepper motor module	Connection for two stepper motors with SSI interface, 2-phase bipolar	Connection for two stepper motors with Hiperface interface, 2-phase bipolar
General information	80SD100XD.C033-01	80SD100XD.C011-01
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
24 VDC supply	80SD100XD.C033-01	80SD100XD.C011-01
Input voltage		24 VDC $\pm 25\%$
Power consumption		
CPU ¹⁾		Max. 8 W
X2X Link supply		Generated internally from the CPU supply
Power supply	80SD100XD.C033-01	80SD100XD.C011-01
Input voltage		24 to 64 VDC $\pm 25\%$
Line protection		Must be handled externally
Motor connection	80SD100XD.C033-01	80SD100XD.C011-01
Quantity		2
Nominal current		10 A _{Peak}
Max. current / motor		15 A _{Peak} (2 s)
Max. current / module		30 A _{Peak}
Nominal switching frequency		38.5 kHz
Max. motor line length		25 m
Motor holding brake connection	80SD100XD.C033-01	80SD100XD.C011-01
Quantity		1
Continuous current		1 A
Max. internal resistance		0.3 Ω
Interfaces	80SD100XD.C033-01	80SD100XD.C011-01
X2X		
Design		4-pin male connector
Encoder inputs	80SD100XD.C033-01	80SD100XD.C011-01
Quantity		2
Type	SSI absolute encoder	Hiperface encoder
Max. encoder cable length		25 m
Encoder supply		
Output voltage ²⁾	24 V	Typ. 11.5 V
Load capability	80 mA	200 mA

80SD100XD.C033-01, 80SD100XD.C011-01

Sine/Cosine inputs		
Signal transmission	-	Differential signal, asymmetrical
Signal frequency	-	200 kHz
Differential voltage	-	0.5 to 1.25 V _{ss}
Common-mode voltage	-	Max. ±7 V
Terminating resistor	-	120 Ω
Resolution ³⁾	-	16 bits per sine/cosine period
Bit width of the position value	-	Max. 32-bit
Serial interface		
Baud rate	-	Configurable (max. 38.4 kBaud, see "Operation" section)
Synchronous serial interface		
Signal transmission	RS485	-
Keying	Gray, binary	-
Word size	Max. 32-bit	-
Baud rate	Configurable (max. 1 Mbit/s, see Operation)	-
Max. signal delay	≤1.25 μs	-
Differential voltage	Typ. 2.5 V	-
Enable inputs	80SD100XD.C033-01	80SD100XD.C011-01
Quantity		1
Input current at nominal voltage		Typ. 60 mA
Digital inputs / Trigger inputs	80SD100XD.C033-01	80SD100XD.C011-01
Quantity		2
Can be used as trigger input		2
Nominal voltage		24 VDC
Input voltage		24 VDC ±25%
Input current at nominal voltage		Typ. 10 mA
Operating conditions	80SD100XD.C033-01	80SD100XD.C011-01
Mounting orientation		
Vertical		Yes
EN 60529 protection		IP20
Environmental conditions	80SD100XD.C033-01	80SD100XD.C011-01
Temperature		
Operation		0 to 45°C
Mechanical characteristics	80SD100XD.C033-01	80SD100XD.C011-01
Note	Order terminal blocks and cables separately	
Dimensions ⁴⁾		
Width		65 mm
Height		134 mm
Depth		95 mm

¹⁾ Including enable input.

²⁾ Depends on the supply of the CPU component

³⁾ Noise on the encoder signal reduces the resolution that can be used by approx. 5 bits (factor of 32).

⁴⁾ Without heat spreader.

Stepper motor modules

80SD100XD.W0XX-01, 80SD100XD.W044-01



Short description	80SD100XD.W0XX-01	80SD100XD.W044-01
Stepper motor module	Connection for two stepper motors without encoder, 2-phase bipolar	Connection for two stepper motors with ABR interface, 2-phase bipolar
General information	80SD100XD.W0XX-01	80SD100XD.W044-01
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
24 VDC supply	80SD100XD.W0XX-01	80SD100XD.W044-01
Input voltage		24 VDC $\pm 25\%$
Power consumption		
CPU ¹⁾	Max. 6 W	Max. 8 W
X2X Link supply		Generated internally from the CPU supply
Power supply	80SD100XD.W0XX-01	80SD100XD.W044-01
Input voltage		24 to 64 VDC $\pm 25\%$
Line protection		Must be handled externally
Motor connection	80SD100XD.W0XX-01	80SD100XD.W044-01
Quantity		2
Nominal current		10 A _{Peak}
Max. current / motor		15 A _{Peak} (2 s)
Max. current / module		30 A _{Peak}
Nominal switching frequency		38.5 kHz
Max. motor line length		25 m
Motor holding brake connection	80SD100XD.W0XX-01	80SD100XD.W044-01
Quantity		1
Continuous current		1 A
Max. internal resistance		0.3 Ω
Interfaces	80SD100XD.W0XX-01	80SD100XD.W044-01
X2X		
Design		4-pin male connector
Encoder inputs	80SD100XD.W0XX-01	80SD100XD.W044-01
Quantity	-	2
Type	-	ABR single-ended signals 24 V
Max. encoder cable length	-	25 m
Encoder supply		
Output voltage ²⁾	-	24 V
Load capability	-	40 mA, Important: 1 PTC for both encoder channels ³⁾
Inputs A, B, R		
Switching threshold		
Low	-	<5 V (to COM)
High	-	<15 V (to COM)

80SD100XD.W0XX-01, 80SD100XD.W044-01

Temperature measurement		
Type	-	KTY
Value	-	0 to 110°C
Tolerance	-	5%
Incremental encoder operation	80SD100XD.W0XX-01	80SD100XD.W044-01
Signal form	-	Square wave pulse
Evaluation	-	4x
Counter size	-	16-bit
Input frequency	-	Max. 50 kHz
Counter frequency	-	200 kHz
Input current at nominal voltage	-	Typ. 4 mA
Enable inputs	80SD100XD.W0XX-01	80SD100XD.W044-01
Quantity		1
Input current at nominal voltage		Typ. 60 mA
Digital inputs / Trigger inputs	80SD100XD.W0XX-01	80SD100XD.W044-01
Quantity		2
Can be used as trigger input		2
Nominal voltage		24 VDC
Input voltage		24 VDC ±25%
Input current at nominal voltage		Typ. 10 mA
Operating conditions	80SD100XD.W0XX-01	80SD100XD.W044-01
Mounting orientation		
Vertical		Yes
EN 60529 protection		IP20
Environmental conditions	80SD100XD.W0XX-01	80SD100XD.W044-01
Temperature		
Operation		0 to 45°C
Mechanical characteristics	80SD100XD.W0XX-01	80SD100XD.W044-01
Note	Order terminal blocks and cables separately	
Dimensions ⁴⁾		
Width		65 mm
Height		134 mm
Depth		95 mm

¹⁾ Including the enable input.

²⁾ Depends on the supply of the CPU component.

³⁾ See "X6 - Input circuit diagram for incremental encoder".

⁴⁾ Without heat sink.

Inverter modules

80VD100PS.C00X-01, 80VD100PD.C000-01, 80VD100PD.C000-14



Short description	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Inverter module	Connection for one servo motor with EnDat 2.2 interface	Connection for two servo motors with EnDat 2.2 interface	Connection for two servo motors with EnDat 2.2 interface
General information	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Certification			
CE		Yes	
cULus		Yes	
GOST-R		Yes	
24 VDC supply	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Input voltage		24 VDC ±25%	
Power consumption			
CPU ¹⁾		Max. 8 W	
Power supply	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Input voltage		24 to 64 VDC ±25%	
Line protection		Must be handled externally	
Motor connection	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Quantity	1	2	2
Nominal current		8 A _{RMS} / 11.3 A _{Peak}	
Max. current / motor		10.6 A _{RMS} / 15 A _{Peak}	
Max. current / module	15 A _{Peak}	30 A _{Peak}	30 A _{Peak}
Nominal switching frequency		5 kHz	
Possible switching frequencies		5 / 10 / 20 kHz	
Max. motor line length		25 m	
Controller frequency		20 kHz	
Motor holding brake connection	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Quantity	1	1	2
Continuous current		1 A	
Max. internal resistance		0.3 Ω	
Interfaces	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
POWERLINK			
Design		Female RJ45 connector	
Electrical isolation		Yes	
Encoder inputs	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Quantity	1	2	2
Type		EnDat 2.2	
Max. encoder cable length		25 m	
Encoder supply			
Output voltage ²⁾		Typ. 125 VDC	
Load capability		Max. 250 mA	
Synchronous serial interface			
Signal transmission		RS485	
Data transfer rate		6.25 Mbit/s	

80VD100PS.C00X-01, 80VD100PD.C000-01, 80VD100PD.C000-14

Enable inputs	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Quantity		1	
Input current at nominal voltage		Typ. 60 mA	
Digital inputs / Trigger inputs	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Quantity		2	
Can be used as trigger input		2	
Nominal voltage		24 VDC	
Input voltage		24 VDC ±25%	
Input current at nominal voltage		Typ. 10 mA	
Digital inputs (option board)	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Quantity	-	-	1
Input voltage			
Nominal	-	-	24 VDC
Maximum	-	-	30 VDC
Electrical isolation	-	-	Yes
Digital outputs (option board)	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Quantity	-	-	1
Continuous current	-	-	1 A
Operating conditions	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Mounting orientation			
Vertical		Yes	
EN 60529 protection		IP20	
Environmental conditions	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Temperature			
Operation		0 to 45°C	
Mechanical characteristics	80VD100PS.C00X-01	80VD100PD.C000-01	80VD100PD.C000-14
Note		Order terminal blocks and cables separately	
Dimensions ³⁾			
Width		65 mm	
Height		134 mm	
Depth		95 mm	

¹⁾ Including enable input.

²⁾ Depends on the supply voltage of the CPU component.

³⁾ Without heat spreader.

Inverter modules

80VD100PS.C02X-01, 80VD100PD.C022-01, 80VD100PD.C022-14



Short description	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Inverter module	Connection for one servo motor with resolver interface	Connection for two servo motors with resolver interface	Connection for two servo motors with resolver interface
General information	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Certification			
CE		Yes	
cULus		Yes	
GOST-R		Yes	
24 VDC supply	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Input voltage		24 VDC ±25%	
Power consumption			
CPU ¹⁾		Max. 8 W	
Power supply	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Input voltage		24 to 64 VDC ±25%	
Line protection		Must be handled externally	
Motor connection	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Quantity	1	2	2
Nominal current		8 A _{RMS} / 11.3 A _{Peak}	
Max. current / motor		10.6 A _{RMS} / 15 A _{Peak}	
Max. current / module	15 A _{Peak}	30 A _{Peak}	30 A _{Peak}
Nominal switching frequency		5 kHz	
Possible switching frequencies		5 / 10 / 20 kHz	
Max. motor line length		25 m	
Controller frequency		20 kHz	
Motor holding brake connection	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Quantity	1	1	2
Continuous current		1 A	
Max. internal resistance		0.3 Ω	
Interfaces	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
POWERLINK			
Design		Female RJ45 connector	
Electrical isolation		Yes	
Resolver inputs	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Quantity	1	2	2
Reference output			
Frequency		10 kHz	
Signal transmission		Differential signal	
Angular position resolution		14 bits/rev	
Resolver transformation ratio			
BRX		0.5 (±10%)	
BRT		0.5 (±10%) with restrictions	

80VD100PS.C02X-01, 80VD100PD.C022-01, 80VD100PD.C022-14

Enable inputs	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Quantity		1	
Input current at nominal voltage		Typ. 60 mA	
Digital inputs / Trigger inputs	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Quantity		2	
Can be used as trigger input		2	
Nominal voltage		24 VDC	
Input voltage		24 VDC ±25%	
Input current at nominal voltage		Typ. 10 mA	
Digital inputs (option board)	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Quantity	-	-	1
Input voltage			
Nominal	-	-	24 VDC
Maximum	-	-	30 VDC
Electrical isolation	-	-	Yes
Digital outputs (option board)	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Quantity	-	-	1
Max. switching frequency	-	-	100 Hz
Continuous current	-	-	1 A
Operating conditions	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Mounting orientation			
Vertical		Yes	
EN 60529 protection		IP20	
Environmental conditions	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Temperature			
Operation		0 to 45°C	
Mechanical characteristics	80VD100PS.C02X-01	80VD100PD.C022-01	80VD100PD.C022-14
Note		Order terminal blocks and cables separately	
Dimensions ²⁾			
Width		65 mm	
Height		134 mm	
Depth		95 mm	

¹⁾ Including enable input.

²⁾ Without heat spreader.

Inverter modules

80VD100PD.C188-01



Short description

Inverter module	Connection for two servo motors with LinMot® interface
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General information

Certification	
CE	Yes
cULus	Yes
GOST-R	Yes

24 VDC supply

Input voltage	24 VDC ±25%
Power consumption	
CPU ¹⁾	Max. 8 W

Power supply

Input voltage	24 to 64 VDC ±25%
Line protection	Must be handled externally

Motor connection

Quantity	2
Nominal current	8 A _{RMS} / 11.3 A _{Peak} ²⁾
Max. current / motor	10.6 A _{RMS} / 15 A _{Peak} ²⁾
Max. current / module	30 A _{Peak} ²⁾
Max. phase voltage	
Linear motor	Input voltage of the power supply / $\sqrt{2}$ ³⁾
Rotary motor	Power supply input voltage ³⁾
Nominal switching frequency	5 kHz
Possible switching frequencies	5 / 10 / 20 kHz
Max. motor line length	20 m
Controller frequency	20 kHz

Motor holding brake connection

Quantity	1
Continuous current	1 A
Max. internal resistance	0.3 Ω

Interfaces

POWERLINK	
Design	Female RJ45 connector
Electrical isolation	Yes

Encoder inputs

Quantity	2
Type	LinMot®

Enable inputs

Quantity	1
Input current at nominal voltage	Typ. 60 mA

Digital inputs / Trigger inputs

Quantity	2
Can be used as trigger input	2
Nominal voltage	24 VDC
Input voltage	24 VDC ±25%
Input current at nominal voltage	Typ. 10 mA

80VD100PD.C188-01

Operating conditions

Mounting orientation	
Vertical	Yes
EN 60529 protection	IP20

Environmental conditions

Temperature	
Operation	0 to 45°C

Mechanical characteristics

Note	Order terminal blocks and cables separately
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Dimensions ⁴⁾

Width	65 mm
Height	134 mm
Depth	95 mm

¹⁾ Including the enable input.

²⁾ When the motor voltage increases, the maximum permitted peak current decreases. In this case, the two channels are only permitted to be operated under the following restrictions:

(a) Both channels are operated with a maximum peak current of 12.5 A_{Peak}.

(b) One channel is operated with a maximum peak current of 15 A_{Peak} and the other with a maximum peak current of 10 A_{Peak}.
The nominal current is not affected by this restriction.

³⁾ The type of motor (linear or rotary motor) being operated by the ACOPOSmicro drive is configured via software using a Parameter ID (see the "Operation" section).

⁴⁾ Without heat spreader.

Power supply module

80PS080X3.10-01



General information

Electrical isolation	
Mains input - Power output	Yes
Mains input - 24 VDC	Yes
Power output - 24 VDC	No
X2X Link - Mains input	Yes
X2X Link - Power output	Yes
X2X Link - 24 VDC	Yes

Certification	
CE	Yes
cULus	Yes
GOST-R	In preparation
UL/CSA	Yes

Mains input

Input voltage range	3x 380 to 480 VAC $\pm 10\%$
Input current at full load	3x 2.2 A @ 400 VAC 3x 1.8 A @ 480 VAC
Frequency range of mains voltage	50 to 60 Hz $\pm 5\%$
Power failure bypass	10 ms (at full load)
Power factor (cos φ)	0.72 @ 400 V 1 kW 0.69 @ 480 V 1 kW
Discharge current to PE	<3.5 mA
Protective circuit	Transient surge protection with varistor

Power output

Output power	Max. 1000 W continuous power
Output protection	Short circuit, overload and open circuit protection
Power back immunity	Yes, <100 VDC
Output voltage ¹⁾	24 to 80 VDC
Output current	
24 to 60 VDC	Max. 16.6 A continuous current
60 to 80 VDC	Max. 16.6 to 12.5 A continuous current
Turn-on time	<5 s (does not apply during firmware update)

24 VDC voltage output

Voltage range	24 VDC $\pm 10\%$
Output current	Max. 2 A continuous current
Parallel operation	No

Chopper output ¹⁾

Output current / Output power	
Continuous current / Continuous power	30 A
Maximum current / Maximum power	40 A

Interfaces

User interface	
Design	10-pin terminal block
Type	X2X Link

80PS080X3.10-01

Efficiency, reliability

Effectiveness >92%

Power loss

Rated load 90 W

No-load operation 30 W

Environmental conditions

Temperature

Operation 0 to 50°C

Mechanical characteristics

Material Robust metal housing

Dimensions

Width 67.5 mm

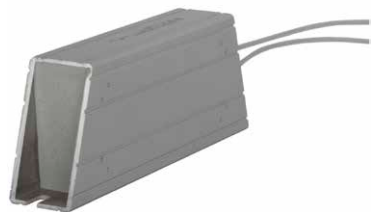
Height 257 mm

Depth 219 mm

¹⁾ Can be set via X2X communication.

Braking resistors

80XBR0025.010-11, 80XBR0055.010-11



General information	80XBR0025.010-11	80XBR0055.010-11
Certification cULus		Yes
Braking resistors	80XBR0025.010-11	80XBR0055.010-11
Continuous power Horizontal		100 W
Ohmic resistance	2.5 Ω ±10%	5.5 Ω ±10%
Temperature model data	80XBR0025.010-11	80XBR0055.010-11
Thermal resistance between braking resistor and the environment	5.075 K/W	5.155 K/W
Heat capacitance of the filament	5.4 J/K	3.8 J/K
Max. permitted overtemperature of wire resistor	558°C	567°C
Operating conditions	80XBR0025.010-11	80XBR0055.010-11
EN 60529 protection		IP50
Environmental conditions	80XBR0025.010-11	80XBR0055.010-11
Temperature Operation		-40 to 90°C
Mechanical characteristics	80XBR0025.010-11	80XBR0055.010-11
Dimensions		
Width		165 mm
Height		60 mm
Depth		31 mm

Terminal blocks

0TB2102.4021, 0TB2102.4121-01, 0TB2102.4022, 0TB2102.4122-01



Terminal block	0TB2102.4021	0TB2102.4121-01	0TB2102.4022	0TB2102.4122-01
Note	Nominal values according to UL			
Number of pins	2			
Type of terminal clamp	Screw clamp terminal block	Cage clamp terminal block	Screw clamp terminal block	Cage clamp terminal block
Cable type	Only copper wires (no aluminum wires!)			
Keying	AX1	AX1	AX2	AX2
Distance between contacts	5.08 mm			
Connection cross section				
AWG wire			26 to 12 AWG	
Wire end sleeves with plastic covering	0.25 to 2.50 mm ²	0.20 to 1.50 mm ²	0.25 to 2.50 mm ²	0.20 to 1.50 mm ²
Solid wires			0.20 to 2.50 mm ²	
Fine strand wires			0.20 to 2.50 mm ²	
With wire end sleeves			0.20 to 2.50 mm ²	
Tightening torque	0.4 to 0.5 Nm	-	0.4 to 0.5 Nm	-
Electrical characteristics	0TB2102.4021	0TB2102.4121-01	0TB2102.4022	0TB2102.4122-01
Nominal voltage	300 V			
Nominal current ¹⁾	15 A / contact			
Contact resistance	≤2 mΩ	≤5 mΩ	≤2 mΩ	≤5 mΩ

¹⁾ The limit data for each I/O module must be taken into consideration.

Terminal blocks

0TB2104.4021, 0TB2104.4121-01, 0TB2104.4022, 0TB2104.4122-01



Terminal block	0TB2104.4021	0TB2104.4121-01	0TB2104.4022	0TB2104.4122-01
Note	Nominal values according to UL			
Number of pins	4			
Type of terminal clamp	Screw clamp terminal block	Cage clamp terminal block	Screw clamp terminal block	Cage clamp terminal block
Cable type	Only copper wires (no aluminum wires!)			
Keying	AX1	AX1	AX2	AX2
Distance between contacts	5.08 mm			
Connection cross section				
AWG wire			26 to 12 AWG	
Wire end sleeves with plastic covering	0.25 to 2.50 mm ²	0.20 to 1.50 mm ²	0.25 to 2.50 mm ²	0.20 to 1.50 mm ²
Solid wires			0.20 to 2.50 mm ²	
Fine strand wires			0.20 to 2.50 mm ²	
With wire end sleeves			0.20 to 2.50 mm ²	
Tightening torque	0.4 to 0.5 Nm	-	0.4 to 0.5 Nm	-
Electrical characteristics	0TB2104.4021	0TB2104.4121-01	0TB2104.4022	0TB2104.4122-01
Nominal voltage	300 V			
Nominal current ¹⁾	15 A / contact			
Contact resistance	≤2 mΩ	≤5 mΩ	≤2 mΩ	≤5 mΩ

¹⁾ The limit data for each I/O module must be taken into consideration.

0TB2105.4021, 0TB2105.4121-01, 0TB2105.4022, 0TB2105.4122-01



Terminal block	0TB2105.4021	0TB2105.4121-01	0TB2105.4022	0TB2105.4122-01
Note	Nominal values according to UL			
Number of pins	5			
Type of terminal clamp	Screw clamp terminal block	Cage clamp terminal block	Screw clamp terminal block	Cage clamp terminal block
Cable type	Only copper wires (no aluminum wires!)			
Keying	AX1	AX1	AX2	AX2
Distance between contacts	5.08 mm			
Connection cross section				
AWG wire			26 to 12 AWG	
Wire end sleeves with plastic covering	0.25 to 2.50 mm ²	0.20 to 1.50 mm ²	0.25 to 2.50 mm ²	0.20 to 1.50 mm ²
Solid wires			0.20 to 2.50 mm ²	
Fine strand wires			0.20 to 2.50 mm ²	
With wire end sleeves			0.20 to 2.50 mm ²	
Tightening torque	0.4 to 0.5 Nm	-	0.4 to 0.5 Nm	-
Electrical characteristics	0TB2105.4021	0TB2105.4121-01	0TB2105.4022	0TB2105.4122-01
Nominal voltage	300 V			
Nominal current ¹⁾	15 A / contact			
Contact resistance	≤2 mΩ	≤5 mΩ	≤2 mΩ	≤5 mΩ

¹⁾ The limit data for each I/O module must be taken into consideration.

Terminal blocks

0TB2105.9021, 0TB2105.9121-01



Terminal block	0TB2105.9021	0TB2105.9121-01	
Note	Nominal values according to UL		
Number of pins	5		
Type of terminal clamp	Screw clamp terminal block	Cage clamp terminal block	
Cable type	Only copper wires (no aluminum wires!)		
Keying	DC		
Distance between contacts	5.08 mm		
Connection cross section			
AWG wire		26 to 12 AWG	
Wire end sleeves with plastic covering	0.25 to 2.50 mm ²		0.20 to 1.50 mm ²
Solid wires		0.20 to 2.50 mm ²	
Fine strand wires		0.20 to 2.50 mm ²	
With wire end sleeves		0.20 to 2.50 mm ²	
Tightening torque	0.4 to 0.5 Nm	-	
Electrical characteristics	0TB2105.9021	0TB2105.9121-01	
Nominal voltage		300 V	
Nominal current ¹⁾		15 A / contact	
Contact resistance	≤2 mΩ	≤5 mΩ	

¹⁾ The limit data for each I/O module must be taken into consideration.

0TB1106.8010, 0TB1106.8110



Terminal block	0TB1106.8010	0TB1106.8110
Note	Protected against vibration by the screw flange, nominal values according to UL	
Number of pins	6	
Type of terminal clamp	Screw clamp terminal block	Cage clamp terminal block
Cable type	Only copper wires (no aluminum wires!)	
Distance between contacts	3.5 mm	
Connection cross section		
AWG wire	28 to 14 AWG	26 to 14 AWG
Wire end sleeves with plastic covering	0.20 to 1.50 mm ²	0.20 to 1.00 mm ²
Solid wires		0.20 to 1.50 mm ²
Fine strand wires		0.20 to 1.50 mm ²
With wire end sleeves		0.20 to 1.50 mm ²
Tightening torque	0.2 to 0.25 Nm	-
Electrical characteristics	0TB1106.8010	0TB1106.8110
Nominal voltage	300 V	
Nominal current ¹⁾	10 A / contact	
Contact resistance	≤4.2 mΩ	

¹⁾ The limit data for each I/O module must be taken into consideration.

Terminal blocks

0TB1110.8010, 0TB1110.8110, 0TB1310.3100, 0TB1310.8110, 0TB1410.8110-01



Terminal block	0TB1110.8010	0TB1110.8110	0TB1310.3100	0TB1310.8110	0TB1410.8110-01
Note	Protected against vibration by the screw flange, nominal values according to UL	Protected against vibration by the screw flange, nominal values according to UL	Nominal values according to UL	with labeling, nominal values according to UL	With LED display, nominal values according to UL
Number of pins	10	10	30	30	30
Type of terminal clamp	Screw clamp terminal block	Cage clamp terminal block	Cage clamp terminal block	Cage clamp terminal block	Cage clamp terminal block
Cable type	Only copper wires (no aluminum wires!)				
Distance between contacts	3.5 mm				
Connection cross section					
AWG wire	28 to 14 AWG	26 to 14 AWG	22 to 16 AWG	22 to 16 AWG	22 to 16 AWG
Wire end sleeves with plastic covering	0.20 to 1.50 mm ²	0.20 to 1.00 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²
Solid wires			0.20 to 1.50 mm ²		
Fine strand wires			0.20 to 1.50 mm ²		
With wire end sleeves			0.20 to 1.50 mm ²		
Tightening torque	0.2 to 0.25 Nm	-	-	-	-
Electrical characteristics	0TB1110.8010	0TB1110.8110	0TB1310.3100	0TB1310.8110	0TB1410.8110-01
Nominal voltage	300 V	300 V	300 V	300 V	50 V
Nominal current ¹⁾	10 A / contact	10 A / contact	5 A / contact or busbar	5 A / contact or busbar	5 A / contact or busbar
Contact resistance	≤4.2 mΩ				

¹⁾ The limit data for each I/O module must be taken into consideration.

0TB3102-7010, 0TB3104-7021, 0TB3104-7022, 0TB103.3, 0TB710.90, 0TB710.91



Terminal block	0TB3102-7010	0TB3104-7021	0TB3104-7022	0TB103.3	0TB710.90	0TB710.91
Note	Multi-function flange for secure, fast and tool-free locking Nominal values according to UL	Multi-function flange for secure, fast and tool-free locking Nominal values according to UL	Multi-function flange for secure, fast and tool-free locking Nominal values according to UL	Protected against vibration by the screw flange Nominal values according to UL	Mechanical removal aid Nominal values according to UL	Mechanical removal aid Nominal values according to UL
Number of pins	2	4	4	3 (male)	10	10
Type of terminal clamp	Screw clamp terminal block	Screw clamp terminal block	Screw clamp terminal block	Screw clamp terminal block	Screw clamp terminal block	Cage clamp terminal block
Cable type	Only copper wires (no aluminum wires!)					
Distance between contacts	7.62 mm	7.62 mm	7.62 mm	5.08 mm	3.5 mm	3.5 mm
Connection cross section						
AWG wire	22 to 10 AWG	22 to 10 AWG	22 to 10 AWG	26 to 14 AWG	26 to 14 AWG	26 to 14 AWG
Wire end sleeves with plastic covering	0.25 to 6 mm ²	0.25 to 6 mm ²	0.25 to 6 mm ²	0.20 to 1.50 mm ²	0.20 to 1.00 mm ²	0.20 to 1.00 mm ²
Solid wires	0.20 to 6 mm ²	0.20 to 6 mm ²	0.20 to 6 mm ²	0.20 to 2.50 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²
Fine strand wires	0.50 to 6 mm ²	0.50 to 6 mm ²	0.50 to 6 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²
With wire end sleeves	0.25 to 6 mm ²	0.25 to 6 mm ²	0.25 to 6 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²
Tightening torque	0.5 to 0.6 Nm	0.5 to 0.6 Nm	0.5 to 0.6 Nm	-	-	-
Electrical characteristics	0TB3102-7010	0TB3104-7021	0TB3104-7022	0TB103.3	0TB710.90	0TB710.91
Nominal voltage	600 V	600 V	600 V	300 V	300 V	300 V
Nominal current ¹⁾	31 A	31 A	31 A	10 A / contact	10 A / contact	10 A / contact
Contact resistance	≤4.5 mΩ	≤4.5 mΩ	≤4.5 mΩ	≤5 mΩ	≤4.2 mΩ	≤4.2 mΩ

¹⁾ The limit data for each I/O module must be taken into consideration.

Terminal sets

Model number	Description
80XSD100XD.C0-01A	Screw clamp set for ACOPOSmicro modules 80SD100XD.xxxx-01: 1x 0TB1110.8010, 1x 0TB2105.4021, 1x 0TB2105.4022, 1x 0TB2105.9021
80XSD100XD.C0-01B	Cage clamp set for ACOPOSmicro modules 80SD100XD.xxxx-01: 1x 0TB1110.8110, 1x 0TB2105.4121-01, 1x 0TB2105.4122-01, 1x 0TB2105.9121-01
80XSD100XD.C0-13A	Screw clamp set for ACOPOSmicro modules 80SD100XD.xxxx-13: 1x 0TB1110.8010, 1x 0TB1106.8010, 1x 0TB2105.4021, 1x 0TB2105.4022, 1x 0TB2105.9021
80XSD100XD.C0-13B	Cage clamp set for ACOPOSmicro modules 80SD100XD.xxxx-13: 1x 0TB1110.8110, 1x 0TB1106.8110, 1x 0TB2105.4121-01, 1x 0TB2105.4122-01, 1x 0TB2105.9121-01
80XSD100XD.C0-21A	Screw clamp set for ACOPOSmicro modules 80SD100XD.xxxx-21: 1x 0TB1110.8010, 1x 0TB1106.8010, 1x 0TB2105.4021, 1x 0TB2105.4022, 1x 0TB2105.9021
80XSD100XD.C0-21B	Cage clamp set for ACOPOSmicro modules 80SD100XD.xxxx-21: 1x 0TB1110.8110, 1x 0TB1106.8110, 1x 0TB2105.4121-01, 1x 0TB2105.4122-01, 1x 0TB2105.9121-01
80XSD100XS.C0-01A	Screw clamp set for ACOPOSmicro modules 80SD100XS.xxxx-01: 1x 0TB1110.8010, 1x 0TB2105.4021, 1x 0TB2105.9021
80XSD100XS.C0-01B	Cage clamp set for ACOPOSmicro modules 80SD100XS.xxxx-01: 1x 0TB1110.8110, 1x 0TB2105.4121-01, 1x 0TB2105.9121-01
80XSD100XS.C0-13A	Screw clamp set for ACOPOSmicro modules 80SD100XS.xxxx-13: 1x 0TB1110.8010, 1x 0TB1106.8010, 1x 0TB2105.4021, 1x 0TB2105.9021
80XSD100XS.C0-13B	Cage clamp set for ACOPOSmicro modules 80SD100XS.xxxx-13: 1x 0TB1110.8110, 1x 0TB1106.8110, 1x 0TB2105.4121-01, 1x 0TB2105.9121-01
80XVD100PD.C0-01A	Screw clamp set for ACOPOSmicro modules 80VD100PD.xxxx-01: 1x 0TB1110.8010, 1x 0TB2105.9021, 1x 0TB2104.4021, 1x 0TB2104.4022, 1x 0TB2102.4021, 1x 0TB2102.4022
80XVD100PD.C0-01B	Cage clamp set for ACOPOSmicro modules 80VD100PD.xxxx-01: 1x 0TB1110.8110, 1x 0TB2105.9121-01, 1x 0TB2104.4121-01, 1x 0TB2104.4122-01, 1x 0TB2102.4121-01, 1x 0TB2102.4122-01
80XVD100PD.C0-14A	Screw clamp set for ACOPOSmicro modules 80VD100PD.xxxx-14: 1x 0TB1110.8010, 1x 0TB2105.9021, 1x 0TB2104.4021, 1x 0TB2104.4022, 1x 0TB2102.4021, 1x 0TB2102.4022, 1x 0TB1106.8010
80XVD100PD.C0-14B	Cage clamp set for ACOPOSmicro modules 80VD100PD.xxxx-14: 1x 0TB1110.8110, 1x 0TB2105.9121-01, 1x 0TB2104.4121-01, 1x 0TB2104.4122-01, 1x 0TB2102.4121-01, 1x 0TB2102.4122-01, 1x 0TB1106.8110
80XVD100PD.C1-01A	Screw clamp set for ACOPOSmicro module 80VD100PD.C188-01: 1x 0TB1110.8010, 1x 0TB2105.9021, 1x 0TB2105.4031, 1x 0TB2105.4032
80XVD100PD.C1-01B	Cage clamp set for ACOPOSmicro module 80VD100PD.C188-01: 1x 0TB1110.8110, 1x 0TB2105.9121-01, 1x 0TB2105.4131, 1x 0TB2105.4132
80XVD100PS.C0-01A	Screw clamp set for ACOPOSmicro modules 80VD100PS.xxxx-01: 1x 0TB1110.8010, 1x 0TB2105.9021, 1x 0TB2104.4021, 1x 0TB2102.4021
80XVD100PS.C0-01B	Cage clamp set for ACOPOSmicro modules 80VD100PS.xxxx-01: 1x 0TB1110.8110, 1x 0TB2105.9121-01, 1x 0TB2104.4121-01, 1x 0TB2102.4121-01
80XPS080X3.10-01A	Screw clamp set for 80PS080X3.10-01: 1x 0TB3104-7021, 1x 0TB3104-7022, 1x 0TB3102-7010, 1x 0TB1110.8010, 1x 0TB103.3



EnDat 2.2 cables for inverter modules

Technical data



8BCF0005.1221B-0

8BCF0007.1221B-0

8BCF0010.1221B-0

8BCF0015.1221B-0

8BCF0020.1221B-0

8BCF0025.1221B-0

General information

Listed	UR AWM Style 20963, 80°C, 30 V, E63216 ¹⁾
Certification	
CE	Yes
cULus	Yes

Cable construction

Supply lines	
Quantity	4
Wire colors	White/Green, brown/green, blue, white
Design	Tinned copper stranded wire
Diameter	0.35 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	Yellow, gray, pink, violet
Design	Tinned copper stranded wire
Diameter	0.14 mm ²
Shield	No
Complete shielding	Copper/tin braiding, optical coverage ≥85%
Outer sheathing	
Material	PUR

Connector

Type	12-pin female springtec EnDat connector
Additional connectors	9-pin male DSUB servo connector Connection cycles: >50 Contacts: 9
EN 60529 protection	Protection in accordance with EN 60529: IP20 when connected IP67 when connected

Technical data

8BCF0005.1221B-0

8BCF0007.1221B-0

8BCF0010.1221B-0

8BCF0015.1221B-0

8BCF0020.1221B-0

8BCF0025.1221B-0

Electrical characteristics

Operating voltage ≤ 30 V

Mechanical characteristics

Dimensions

Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	6 mm ± 0.2 mm					
Flex radius						
Single bend	≥ 18 mm					
Moving	≥ 75 mm					
Drag chain data						
Acceleration	≤ 60 m/s ²					
Flex cycles	$\geq 3,000,000$ ²⁾					
Speed	≤ 4 m/s					
Weight	0.33 kg	0.42 kg	0.6 kg	0.9 kg	1.4 kg	1.8 kg

¹⁾ The specified values refer to the raw cable being used.

²⁾ Valid at an ambient temperature of 20°C and a flex radius of 75 mm.

More information and additional cable lengths can be found on the B&R website (www.br-automation.com).

Motor cables for inverter modules (can be used in cable drag chains)

Technical data



8BCM0005.1034C-0

8BCM0007.1034C-0

8BCM0010.1034C-0

8BCM0015.1034C-0

8BCM0020.1034C-0

8BCM0025.1034C-0

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	0.75 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	White, white/red, white/blue, white/green
Design	Tinned copper stranded wire
Diameter	0.35 mm ²
Shield	Separate shielding for pairs, tinned copper braiding, optical coverage >85% and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR

Connector

Type	8-pin female speedtec motor connector
EN 60529 protection	IP67 when connected

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	13 A
Installed in conduit or cable duct	11.5 A
Installed in cable tray	13.5 A

Technical data

8BCM0005.1034C-0

8BCM0007.1034C-0

8BCM0010.1034C-0

8BCM0015.1034C-0

8BCM0020.1034C-0

8BCM0025.1034C-0

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	10.9 mm ±0.4 mm					
Flex radius						
Single bend	>34 mm					
Moving	≥85 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	0.91 kg	1.24 kg	1.75 kg	2.6 kg	3.5 kg	4.2 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 125 mm.

More information and additional cable lengths can be found on the B&R website (www.br-automation.com).

Motor cables for inverter modules (not for use in cable drag chains)

Technical data



8BCM0005.3034C-0

8BCM0007.3034C-0

8BCM0010.3034C-0

8BCM0015.3034C-0

8BCM0020.3034C-0

8BCM0025.3034C-0

General information

Listed	UL Style 2570 80°C 1000 V VW-1 E47573 and cUL AWM I/II A/B 80°C 1000 V FT-1
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	0.75 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	White, white/red, white/blue, white/green
Design	Tinned copper stranded wire
Diameter	0.34 mm ²
Shield	Separate shielding for pairs, tinned copper braiding, optical coverage >85% and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PVC

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	9.8 A
Installed in conduit or cable duct	8.5 A
Installed in cable tray	10.4 A

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	10.6 mm ±0.4 mm					
Flex radius						
Single bend	>55 mm					
Moving	≥165 mm					
Weight	1.2 kg	1.5 kg	2 kg	2.8 kg	3.6 kg	4 kg

More information and additional cable lengths can be found on the B&R website (www.br-automation.com).

Resolver cables for inverter modules (can be used in cable drag chains)

Technical data



8BCR0005.1121A-0

8BCR0007.1121A-0

8BCR0010.1121A-0

8BCR0015.1121A-0

8BCR0020.1121A-0

8BCR0025.1121A-0

General information

Listed	UL AWM Style 20671, 90°C, 30 V, E63216 and CSA AWM, 90°C, 30 V, I/II A/B FT1 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Signal lines	
Quantity	6
Wire colors	White, brown, green, yellow, gray, pink
Design	Tinned copper stranded wire
Diameter	AWG 24 / AWG 19
Shield	No
Complete shielding	Copper braiding, optical coverage $\geq 90\%$ and wrapped in isolating film
Outer sheathing	
Material	PUR

Connector

Type	Male resolver connector, 12-pin female springtec connector
Additional connectors	Male servo connector, female 9-pin DSUB connector Connection cycles: >50 Contacts: 9 Protection in accordance with EN 60529: IP20 when connected
EN 60529 protection	IP67 when connected

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	6.5 mm ± 0.2 mm					
Flex radius						
Single bend	≥ 20 mm					
Moving	≥ 50 mm					
Drag chain data						
Acceleration	< 60 m/s ²					
Flex cycles ¹⁾	$\geq 3,000,000$					
Speed	≤ 4 m/s					
Weight	0.34 kg	0.44 kg	0.6 kg	0.85 kg	1.22 kg	1.5 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 65 mm.

More information and additional cable lengths can be found on the B&R website (www.br-automation.com).

Resolver cables for inverter modules (not for use in cable drag chains)

Technical data



8BCR0005.3121A-0

8BCR0007.3121A-0

8BCR0010.3121A-0

8BCR0015.3121A-0

8BCR0020.3121A-0

8BCR0025.3121A-0

General information

Listed	UL AWM Style 2637 90°C 30 V E130266 and CSA AWM I/II A/B 90°C 30 V, FT1
Certification	
CE	Yes
cULus	Yes

Cable construction

Signal lines	
Quantity	6
Wire colors	White, brown, green, yellow, gray, pink
Design	Tinned copper stranded wire
Diameter	0.22 mm
Shield	No
Complete shielding	Copper braiding, optical coverage $\geq 90\%$ and wrapped in isolating film
Outer sheathing	
Material	PVC

Connector

Type	Male resolver connector, 12-pin female springtec connector
Additional connectors	Male servo connector, female 9-pin DSUB connector Connection cycles: >50 Contacts: 9
EN 60529 protection	Protection in accordance with EN 60529: IP20 when connected IP67 when connected

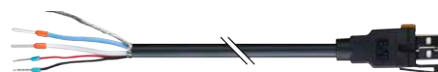
Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	6.3 mm ± 0.2 mm					
Flex radius						
Single bend	≥ 26 mm					
Moving	≥ 52 mm					
Weight	0.34 kg	0.46 kg	0.64 kg	0.94 kg	1.24 kg	1.54 kg

More information and additional cable lengths can be found on the B&R website (www.br-automation.com).

X2X Link / POWERLINK cable

X2X Link - Device attachment cables



Length	Model number	Short description
1 m	X20CA0X48.0010	X2X Link device attachment cable, 1.0 m
2 m	X20CA0X48.0020	X2X Link device attachment cable, 2.0 m
5 m	X20CA0X48.0050	X2X Link device attachment cable, 5.0 m
10 m	X20CA0X48.0100	X2X Link device attachment cable, 10.0 m
20 m	X20CA0X48.0200	X2X Link device attachment cable, 20.0 m

X2X Link - Device connection cables



Length	Model number	Short description
0.3 m	X20CA0X68.0003	X2X Link device connection cable, 0.3 m
1 m	X20CA0X68.0010	X2X Link device connection cable, 1.0 m
2 m	X20CA0X68.0020	X2X Link device connection cable, 2.0 m
5 m	X20CA0X68.0050	X2X Link device connection cable, 5.0 m
10 m	X20CA0X68.0100	X2X Link device connection cable, 10.0 m

POWERLINK cable, RJ45 to RJ45



Connection cables

Length	Model number	Short description
50 m	X20CA0E61.0500	POWERLINK connection cable, RJ45 to RJ45, 50.0 m

POWERLINK cable, RJ45 to RJ45



Attachment cable

Length	Model number	Short description
0.2 m	X20CA0E61.00020	POWERLINK connection cable, RJ45 to RJ45, 0.20 m
0.25 m	X20CA0E61.00025	POWERLINK connection cable, RJ45 to RJ45, 0.25 m
0.3 m	X20CA0E61.00030	POWERLINK connection cable, RJ45 to RJ45, 0.30 m
0.35 m	X20CA0E61.00035	POWERLINK connection cable, RJ45 to RJ45, 0.35 m
0.4 m	X20CA0E61.00040	POWERLINK connection cable, RJ45 to RJ45, 0.40 m
0.5 m	X20CA0E61.00050	POWERLINK connection cable, RJ45 to RJ45, 0.50 m
1 m	X20CA0E61.00100	POWERLINK connection cable, RJ45 to RJ45, 1.00 m
1.5 m	X20CA0E61.00150	POWERLINK connection cable, RJ45 to RJ45, 1.50 m
2 m	X20CA0E61.00200	POWERLINK connection cable, RJ45 to RJ45, 2.00 m
5 m	X20CA0E61.00500	POWERLINK connection cable, RJ45 to RJ45, 5.00 m
10 m	X20CA0E61.01000	POWERLINK connection cable, RJ45 to RJ45, 10.00 m
15 m	X20CA0E61.01500	POWERLINK connection cable, RJ45 to RJ45, 15.00 m
20 m	X20CA0E61.02000	POWERLINK connection cable, RJ45 to RJ45, 20.00 m

Accessories

Hose clamps



Model number	Short description
80XSC0000.00-01	ACOPOSmicro accessories: 1x hose clamp, B 9 mm, D 8 to 12 mm
80XSC0000.00-10	ACOPOSmicro accessories: 10x hose clamp, B 9 mm, D 8 to 12 mm

Battery



Model number	Short description
80XB120A2.36-00	1x lithium battery, 1/2 AA 3.6 V

Stepper motor modules in other product families

X20 system



Model number	Short description
X20SM1426	X20 stepper motor module, 24 VDC $\pm 25\%$ module supply, 1 motor connection, 1 A continuous current, 1.2 A peak current, 4 digital inputs 24 VDC, sink, can be used as an incremental encoder
X20SM1436	X20 stepper motor module, 24 to 39 VDC $\pm 25\%$ module supply, 1 motor connection, 3 A continuous current, 3.5 A peak current, 4 digital inputs 24 VDC, sink, can be used as an incremental encoder

X67 system






Model number	Short description
X67SM2436	X67 stepper motor module, 24 to 38.5 VDC $\pm 25\%$ module supply, max. 8 A, 2 motor connections, 3 A continuous current, 5 A peak current, 2x 3 digital inputs, 24 VDC, sink, can be used as 2 incremental encoders
X67SM4320	X67 stepper motor module, 24 VDC $\pm 25\%$ module supply, 4 motor connections, 1 A continuous current, 1.5 A peak current

ACOPOS P3

Servo drives - High performance in a compact design

The new generation of highly efficient servo drives offers outstanding power density in an extremely compact design, as well as a wide range of SafeMOTION functions including SLT. The legendary performance of the ACOPOS series of servo drives continues with these new ACOPOS P3 products. Controller sampling times down to 50 μ s in all controller cascades ensure the highest level of precision.

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Pin	Description
X1	Power supply / DC bus connector
1	DC+ (red)
2	DC- (black)
3	DC- (black)
4	DC- (black)
5	DC- (black)
6	DC- (black)
7	DC- (black)
8	DC- (black)
9	DC- (black)
10	DC- (black)
X2	+24VDC supply connector
1	+24VDC (red)
2	0VDC (black)
X3A	Encoder connector
X3B	Encoder connector
X3C	Encoder connector
X3D	Encoder connector
X3E	Encoder connector
X3F	Encoder connector
X3G	Encoder connector
X3H	Encoder connector
X3I	Encoder connector
X3J	Encoder connector
X3K	Encoder connector
X3L	Encoder connector
X3M	Encoder connector
X3N	Encoder connector
X3O	Encoder connector
X3P	Encoder connector
X3Q	Encoder connector
X3R	Encoder connector
X3S	Encoder connector
X3T	Encoder connector
X3U	Encoder connector
X3V	Encoder connector
X3W	Encoder connector
X3X	Encoder connector
X3Y	Encoder connector
X3Z	Encoder connector
X4	Encoder connector
X5	Motor / feedback train connector
U	Motor connector U
V	Motor connector V
W	Motor connector W
0	Motor connector 0
1	Motor connector 1
2	Motor connector 2
3	Motor connector 3
4	Motor connector 4
5	Motor connector 5
6	Motor connector 6
7	Motor connector 7
8	Motor connector 8
9	Motor connector 9
10	Motor connector 10
X6	Encoder connector
1	Encoder connector 1
2	Encoder connector 2
3	Encoder connector 3
4	Encoder connector 4
5	Encoder connector 5
6	Encoder connector 6
7	Encoder connector 7
8	Encoder connector 8
9	Encoder connector 9
10	Encoder connector 10
X7	Enable logic connector
1	Enable logic connector 1
2	Enable logic connector 2
3	Enable logic connector 3
4	Enable logic connector 4
5	Enable logic connector 5
6	Enable logic connector 6
7	Enable logic connector 7
8	Enable logic connector 8
9	Enable logic connector 9
10	Enable logic connector 10
X8	Trigger logic connector
1	Trigger logic connector 1
2	Trigger logic connector 2
3	Trigger logic connector 3
4	Trigger logic connector 4
5	Trigger logic connector 5
6	Trigger logic connector 6
7	Trigger logic connector 7
8	Trigger logic connector 8
9	Trigger logic connector 9
10	Trigger logic connector 10
X9	Encoder connector
X10	IT master jumper
X11	Display connector

⚠ DANGER
 Risk of Electric Shock
 Risque d'électrocution
 Before servicing:
 - Disconnect all power supply
 - Wait 5 minutes

⚠ DANGER
 Risk of Electric Shock
 Risque d'électrocution
 Before servicing:
 - Disconnect all power supply
 - Wait 5 minutes

ACOPOS P3 - Big impact, small footprint



With the ACOPOS P3, B&R is setting new standards for motion control. This 3-axis servo drive offers a power density of 6 amps per liter, making it one of the most efficient servo drives with integrated safety functions on the market. It also offers unrivaled dynamics and precision, with a sampling time of just 50 μ s for the entire controller cascade.

More than ever before, machine and system manufacturers are being confronted with demands for increased productivity and availability. At the same time, pressure is constantly building to reduce the manufacturing costs for production machines. The new servo drive generation from B&R was designed to meet these challenges.



69% smaller footprint with maximum power density

The ACOPOS P3 is offered as a 1-, 2- or 3-axis drive and covers a power spectrum ranging from 0.6 to 24 kW, or 1.2 to 44 amps. With a housing as compact as a conventional 1-axis drive, the 3-axis drive reduces cabinet space requirements by 69%.



Intelligent motion control for superior performance

A new dimension in virtual sensing

With a short cycle time of 50 μ s for current, speed and position control, the ACOPOS P3 opens up new opportunities for advanced motion control. For highly dynamic and precise processes like those in the printing and packaging industries, extremely fast movements must be controlled with absolute precision. With the short cycle times of the ACOPOS P3 and the bandwidth and precision of the POWERLINK real-time Ethernet network, this is no problem.

Increased productivity

To strike a balance between increased productivity and decreased energy consumption with a smaller footprint, machine manufacturers are shifting to lightweight construction. This reduces the masses being moved – and thus the moment of inertia – in addition to making the machines less rigid and more elastic. Virtual sensing makes it possible to control these elastic systems while retaining a high level of quality without having to use additional position sensors at the process intervention point.

Encoderless control

The ability to use virtual position encoders eliminates the need for a position encoder, cable and evaluation unit in the servo drive while increasing availability at the same time.





Maximum safety

Thanks to machinery directives in the EU and similar legal regulations in other parts of the world, the safety functions in automation components are becoming increasingly important. The ACOPUS P3 provides a whole range of safety functions that satisfy SIL 3 / PL e / Cat 4 requirements. The new Safely Limited Torque (SLT) function can be used to monitor a defined torque threshold for violations.

Integrated safety functions:

STO	Safe Torque Off
STO1	Safe Torque Off One Channel
SOS	Safe Operating Stop
SS1	Safe Stop 1
SS2	Safe Stop 2
SLS	Safely Limited Speed
SMS	Safe Maximum Speed
SBC	Safe Brake Control
SDI	Safe Direction
SLI	Safely Limited Increment
SLP	Safely Limited Position
SMP	Safe Maximum Position
SLA	Safely Limited Acceleration
RSP	Remanent Safe Position
SBT	Safe Brake Test
SLT	Safely Limited Torque
	Safe Homing

ACOPOS P3 - A new dimension



Safety included

Even a basic automation system consisting of an operator panel, I/O and a drive unit can be equipped with a full-fledged safety solution. The SafeLOGIC-X virtual safety controller runs on an ordinary PLC – giving B&R customers the reliability they have come to expect without requiring a dedicated safety controller.

Completely compatible

The ACOPOS P3 can be combined with any of the drives in the ACOPOSmulti family. Additional space can be saved in the control cabinet, for example, by using the motor-mounted ACOPOSmotor or the machine-mounted ACOPOSremote.

No energy left behind

When using an ACOPOS P3 together with an ACOPOSmulti drive, it is also possible to take advantage of the power regeneration capabilities of the ACOPOSmulti drive system. Instead of being converted to heat by braking resistors, braking energy from the ACOPOS P3 is passed on to an ACOPOSmulti via the DC bus, which feeds it back into the power grid.

Improved international capabilities

The ACOPOS P3 supports the world's most common power mains configurations, including TN, TT, IT and corner grounded TN-S systems. In some circumstances, only an additional line filter is needed to meet the necessary regulations. In addition, the ACOPOS P3 satisfies the machinery and equipment manufacturing requirements set forth in EN 55011, CISPR 11 and EN 61800-3 (first environment, category C2).















Lean automation with Scalability+

The compact design of the ACOPOS P3 is not the only way it helps reduce space requirements. Together with B&R's other automation components, it is possible to implement an extremely lean automation solution. A Power Panel (operator panel and controller), ACOPOS P3 and X20 I/O modules are all that is needed for a complete solution with plenty of power. Since every aspect of the system is fully modular and scalable, there is no limit to the potential for upgrades and expansions – and existing software is guaranteed to be reused with maximum efficiency.

Product overview

ACOPOS P3 servo drive

	1-axis modules 1.6 to 8.8 A, 230 VAC	563
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Display modules



Display modules

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Encoder modules



Plug-in resolver modules

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Hybrid motor cables



1.5 mm² hybrid motor cables

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Cables



1.5 mm² motor cables

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EnDat 2.2 encoder cables

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Resolver cables

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Product overview

Front covers



Cover, single-width, height 1

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Cover, single-width, height 2

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Terminals



Push-in terminals

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Keying plugs



Keying plugs

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ACOPOS P3 – Technology functions

ACOPOS technology functions

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SafeMOTION technology functions

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Order key



Order code	Symbol	Name
b	I	ACOPOS P3 servo drive
ccc	123	Continuous current A_{eff}
d	H	3x 208 - 480 VAC
	M	3x 208 - 230 VAC or 1x 110 - 230 VAC
e	W	Wall mounting
f	S	1-axis module
	D	2-axis module
	T	3-axis module
g	1	Hard-wired STO with digital encoder
	S	SafeMOTION with digital encoder
h	0	Standard
i	X	Plug-in module included in delivery
	0	Plug-in module not included in delivery
j	X	Configurable accessories included in delivery
	0	Configurable accessories not included in delivery
kk	XX	Customer-specific options
	00	No customer-specific options

Continuous current A_{eff} (ccc)

The continuous current A_{eff} of the ACOPOS P3 servo drive is listed in the form of a 3-digit code (ccc) as part of the model number.

Continuous current A_{eff}	Order code ccc	1-axis module	2-axis module	3-axis module
1.6 A	1X6	Yes	No	No
2.2 A	2X2	Yes	Yes	Yes
4.5 A	4X5	Yes	Yes	Yes
8.8 A	8X8	Yes	Yes	Yes

Supply voltage (d)

ACOPOS P3 servo drives are available for various supply voltage requirements.

Supply voltage	Order code (d)	1-axis module	2-axis module	3-axis module
1x 110 VAC to 230 VAC 3x 208 VAC to 230 VAC	M	Yes	Yes	Yes
3x 208 VAC to 480 VAC	H	Yes	Yes	Yes

Plug-in modules (i)

ACOPOS P3 servo drives are available with or without a plug-in module.

Order code (i)	Plug-in module
X	Yes 8EAC0122.003-1 8EAC0122.001-1
0	No

Configurable accessories (j)

ACOPOS P3 8EI servo drives are configurable using accessories that are included in the delivery. The selected accessories are added to the content of the delivery and included in the servo drive product package.

Order code (j)	Internal braking resistor	Front cover	Connector set 2 (2-row)	Connector set 1 (1-row)
0	No	No	No	Yes
1	No	No	Yes	No
2	No	Yes	No	Yes
3	No	Yes	Yes	No
4	Yes	No	No	Yes
5	Yes	No	Yes	No
6	Yes	Yes	No	Yes
7	Yes	Yes	Yes	No
A	No	No	No	No
B	No	Yes	No	No
C	Yes	No	No	No
D	Yes	Yes	No	No

Servo drives, 1.6 to 8.8 A, 230 VAC (1-axis modules)

Technical data



8EI1X6MWS10.XXXX-1

8EI2X2MWS10.XXXX-1

8EI4X5MWS10.XXXX-1

8EI8X8MWS10.XXXX-1

Power mains connector

Mains input voltage	1x 110 VAC to 230 VAC ±10% 3x 200 VAC to 230 VAC ±10%			
Installed load	Max. 1 kVA	Max. 1.25 kVA	Max. 2.5 kVA	Max. 5 kVA
Starting current	In preparation			
Reduction of continuous current according to the ambient temperature above 40°C	Device-dependent			
Integrated line filter in accordance with EN 61800-3, Category C3	No ¹⁾			
Power loss at max. device power without braking resistor	In preparation			

DC bus connection

DC bus capacitance	1880 µF			
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24 VDC supply

Input capacitance	In preparation			
Current consumption	0.9 A + current for motor holding brake ²⁾			

Motor connection

Quantity	1			
Continuous power per motor connection ³⁾	0.4 kW	0.5 kW	1 kW	2 kW
Continuous current per motor connection ³⁾	1.6 A _{eff}	2.2 A _{eff}	4.5 A _{eff}	8.8 A _{eff}
Reduction of continuous current depending on the switching frequency	In preparation			
Switching frequency 5 kHz	In preparation			
Switching frequency 10 kHz	In preparation			
Switching frequency 20 kHz	In preparation			
Reduction of continuous current depending on the installation elevation	In preparation			
Starting at 500 m above sea level	0.16 A _{eff} per 1000 m	0.22 A _{eff} per 1000 m	0.45 A _{eff} per 1000 m	0.88 A _{eff} per 1000 m
Peak current per motor connection	4.5 A _{eff}	6 A _{eff}	12 A _{eff}	24 A _{eff}
Peak power output	0.9 kW	1.25 kW	2.5 kW	5 kW
Possible switching frequencies ⁴⁾	5 / 10 / 20 kHz			
Design	Male connector			
U, V, W, PE	Yes			
Shield connection	Yes			
Terminal connection cross section	1.55 to 6 mm ²			
Flexible and fine wire lines	1.55 to 6 mm ²			
With wire end sleeves	1.55 to 6 mm ²			
Approval data	24 to 8 AWG			
UL/C-UL-US	24 to 8 AWG			
CSA	24 to 8 AWG			
Max. motor line length depending on the switching frequency	25 m			
Switching frequency 5 kHz	25 m			
Switching frequency 10 kHz	In preparation			
Switching frequency 20 kHz	In preparation			

Servo drives, 1.6 to 8.8 A, 230 VAC (1-axis modules)

Technical data

8EI1X6MWS10.XXXX-1

8EI2X2MWS10.XXXX-1

8EI4X5MWS10.XXXX-1

8EI8X8MWS10.XXXX-1

Motor holding brake connection

Quantity	1
Output voltage ⁵⁾	Depends on the input voltage on the X2 connector
Continuous current	1.3 A
Max. internal resistance	0.25 Ω
Max. extinction energy per switching operation	1.5 Ws
Response threshold for open line monitoring	Approx. 30 mA

Braking resistors

Peak power int. / ext.	1.5 kW / 11 kW
Continuous power int. / ext.	100 W / 970 W
Minimum braking resistance (ext.)	12 Ω

Encoder interfaces

Quantity	1
Type	EnDat 2.2
Connections	8-pin female mini I/O connector
Encoder supply	
Output voltage	Typ. 12 V
Load capability	300 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	In preparation

Operating conditions

EN 60529 protection	IP20
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Mechanical characteristics

Dimensions	
Width	66 mm
Height	290 mm
Depth	
Wall mounting	258.5 mm (without 8EXA front cover: 261 mm)
Weight	3.2 kg

¹⁾ A line filter must be connected (e.g. 8B0F0160H000.A00-1).

²⁾ The current consumption depends on the configuration of the ACOPOS P3 module.

³⁾ Valid in the following conditions: 325 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁴⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁵⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified input voltage and wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

Servo drives, 1.6 to 8.8 A, 480 VAC (1-axis modules)

Technical data



8EI1X6HWS10.XXXXX-1

8EI2X2HWS10.XXXXX-1

8EI4X5HWS10.XXXXX-1

8EI8X8HWS10.XXXXX-1

Power mains connector

Mains input voltage	3x 200 VAC to 480 VAC ±10%			
Installed load	Max. 1.8 kVA	Max. 2.5 kVA	Max. 5 kVA	Max. 10 kVA
Starting current	In preparation			
Reduction of continuous current according to the ambient temperature above 40°C	Device-dependent			
Integrated line filter in accordance with EN 61800-3, Category C3	No ¹⁾			
Power loss at max. device power without braking resistor	In preparation			

DC bus connection

DC bus capacitance	470 µF			
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24 VDC supply

Input capacitance	In preparation			
Current consumption	0.9 A + current for motor holding brake ²⁾			

Motor connection

Quantity	1			
Continuous power per motor connection ³⁾	0.7 kW	1 kW	2 kW	4 kW
Continuous current per motor connection ³⁾	1.6 A _{eff}	2.2 A _{eff}	4.5 A _{eff}	8.8 A _{eff}
Reduction of continuous current depending on the switching frequency	In preparation			
Switching frequency 5 kHz	In preparation			
Switching frequency 10 kHz	In preparation			
Switching frequency 20 kHz	In preparation			
Reduction of continuous current depending on the installation elevation	In preparation			
Starting at 500 m above sea level	0.16 A _{eff} per 1000 m	0.22 A _{eff} per 1000 m	0.45 A _{eff} per 1000 m	0.88 A _{eff} per 1000 m
Peak current per motor connection	4.5 A _{eff}	6 A _{eff}	12 A _{eff}	24 A _{eff}
Peak power output	1.9 kW	2.5 kW	5 kW	10 kW
Possible switching frequencies ⁴⁾	5 / 10 / 20 kHz			
Design	Male connector			
U, V, W, PE	Male connector			
Shield connection	Yes			
Terminal connection cross section	1.55 to 6 mm ²			
Flexible and fine wire lines	1.55 to 6 mm ²			
With wire end sleeves	1.55 to 6 mm ²			
Approbation data	24 to 8 AWG			
UL/C-UL-US	24 to 8 AWG			
CSA	24 to 8 AWG			
Max. motor line length depending on the switching frequency	25 m			
Switching frequency 5 kHz	25 m			
Switching frequency 10 kHz	In preparation			
Switching frequency 20 kHz	In preparation			

Servo drives, 1.6 to 8.8 A, 480 VAC (1-axis modules)

Technical data

8EI1X6HWS10.XXXX-1

8EI2X2HWS10.XXXX-1

8EI4X5HWS10.XXXX-1

8EI8X8HWS10.XXXX-1

Motor holding brake connection

Quantity	1
Output voltage ⁵⁾	Depends on the input voltage on the X2 connector
Continuous current	1.3 A
Max. internal resistance	0.25 Ω
Max. extinction energy per switching operation	1.5 Ws
Response threshold for open line monitoring	Approx. 30 mA

Braking resistors

Peak power int. / ext.	7 kW / 25 kW
Continuous power int. / ext.	100 W / 2 kW
Minimum braking resistance (ext.)	25 Ω

Encoder interfaces

Quantity	1
Type	EnDat 2.2
Connections	8-pin female mini I/O connector
Encoder supply	
Output voltage	Typ. 12 V
Load capability	300 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	In preparation

Operating conditions

EN 60529 protection	IP20
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Mechanical characteristics

Dimensions	
Width	66 mm
Height	290 mm
Depth	
Wall mounting	258.5 mm (without 8EXA front cover: 261 mm)
Weight	3.2 kg

¹⁾ An upstream filter must be connected (e.g. 8B0F0160H000.A00-1).

²⁾ The current consumption depends on the configuration of the ACOPOS P3 module.

³⁾ Valid in the following conditions: 560 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁴⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁵⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified input voltage and wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

Servo drives, 2.2 to 8.8 A, 230 VAC (2-axis modules)

Technical data



8EI2X2MWD10.XXXX-1

8EI4X5MWD10.XXXX-1

8EI8X8MWD10.XXXX-1

Power mains connector

Mains input voltage	1x 110 VAC to 230 VAC ±10% 3x 200 VAC to 230 VAC ±10%		
Installed load	Max. 1.25 kVA	Max. 2.5 kVA	Max. 5 kVA
Starting current	In preparation		
Reduction of continuous current according to the ambient temperature above 40°C	Device-dependent		
Integrated line filter in accordance with EN 61800-3, Category C3	No ¹⁾		
Power loss at max. device power without braking resistor	In preparation		

DC bus connection

DC bus capacitance	1880 µF
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24 VDC supply

Input capacitance	In preparation
Current consumption	1.2 A + current for motor holding brake ²⁾

Motor connection

Quantity	2		
Continuous power per motor connection ³⁾	0.5 / 0.5 kW	1 / 1 kW	2 / 2 kW ⁴⁾
Continuous current per motor connection ³⁾	2.2 / 2.2 A _{eff}	4.5 / 4.5 A _{eff}	8.8 / 8.8 A _{eff}
Reduction of continuous current depending on the switching frequency			
Switching frequency 5 kHz	In preparation		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		
Reduction of continuous current depending on the installation elevation			
Starting at 500 m above sea level	0.22 A _{eff} per 1000 m	0.45 A _{eff} per 1000 m	0.88 A _{eff} per 1000 m
Peak current per motor connection	6 / 6 A _{eff}	12 / 12 A _{eff}	24 / 24 A _{eff}
Peak power output	1.25 kW ⁵⁾	2.5 kW ⁶⁾	5 kW ⁷⁾
Possible switching frequencies ⁸⁾	5 / 10 / 20 kHz		
Design			
U, V, W, PE	Male connector		
Shield connection	Yes		
Terminal connection cross section			
Flexible and fine wire lines			
With wire end sleeves	1.55 to 6 mm ²		
Approbation data			
UL/C-UL-US	24 to 8 AWG		
CSA	24 to 8 AWG		
Max. motor line length depending on the switching frequency			
Switching frequency 5 kHz	25 m		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		

Servo drives, 2.2 to 8.8 A, 230 VAC (2-axis modules)

Technical data

8EI2X2MWD10.XXXX-1

8EI4X5MWD10.XXXX-1

8EI8X8MWD10.XXXX-1

Motor holding brake connection

Quantity	2
Output voltage ⁹⁾	Depends on the input voltage on the X2 connector
Continuous current	1.3 A
Max. internal resistance	0.25 Ω
Max. extinction energy per switching operation	1.5 Ws
Response threshold for open line monitoring	Approx. 30 mA

Braking resistors

Peak power int. / ext.	1.5 kW / 11 kW
Continuous power int. / ext.	150 W / 970 W
Minimum braking resistance (ext.)	12 Ω

Encoder interfaces

Quantity	2
Type	EnDat 2.2
Connections	8-pin female mini I/O connector
Encoder supply	
Output voltage	Typ. 12 V
Load capability	300 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	In preparation

Operating conditions

EN 60529 protection	IP20
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Mechanical characteristics

Dimensions	
Width	66 mm
Height	374 mm
Depth	
Wall mounting	258.5 mm (without 8EXA front cover: 261 mm)
Weight	4 kg

¹⁾ An upstream filter must be connected (e.g. 8B0F0160H000.A00-1).

²⁾ The current consumption depends on the configuration of the ACOPOS P3 module.

³⁾ Valid in the following conditions: 325 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁴⁾ The total continuous power of the motor connectors is not permitted to exceed 2 kW.

⁵⁾ The total peak power of all motor connectors is not permitted to exceed 1.25 kW.

⁶⁾ The total peak power of all motor connectors is not permitted to exceed 2.5 kW.

⁷⁾ The total peak power of all motor connectors is not permitted to exceed 5 kW.

⁸⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified input voltage and wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

Servo drives, 2.2 to 8.8 A, 480 VAC (2-axis modules)

Technical data



8EI2X2HWD10.XXXX-1

8EI4X5HWD10.XXXX-1

8EI8X8HWD10.XXXX-1

Power mains connector

Mains input voltage	3x 200 VAC to 480 VAC ±10%		
Installed load	Max. 2.5 kVA	Max. 5 kVA	Max. 10 kVA
Starting current	In preparation		
Reduction of continuous current according to the ambient temperature above 40°C	Device-dependent		
Integrated line filter in accordance with EN 61800-3, Category C3	No ¹⁾		
Power loss at max. device power without braking resistor	In preparation		

DC bus connection

DC bus capacitance	470 µF
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24 VDC supply

Input capacitance	In preparation
Current consumption	1.2 A + current for motor holding brake ²⁾

Motor connection

Quantity	2		
Continuous power per motor connection ³⁾	1 / 1 kW	2 / 2 kW	4 / 4 kW ⁴⁾
Continuous current per motor connection ³⁾	2.2 / 2.2 A _{eff}	4.5 / 4.5 A _{eff}	8.8 / 8.8 A _{eff}
Reduction of continuous current depending on the switching frequency	In preparation		
Switching frequency 5 kHz	In preparation		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		
Reduction of continuous current depending on the installation elevation	In preparation		
Starting at 500 m above sea level	0.22 A _{eff} per 1000 m	0.45 A _{eff} per 1000 m	0.88 A _{eff} per 1000 m
Peak current per motor connection	6 / 6 A _{eff}	12 / 12 A _{eff}	24 / 24 A _{eff}
Peak power output	2.5 kW ⁵⁾	5 kW ⁶⁾	10 kW ⁷⁾
Possible switching frequencies ⁸⁾	5 / 10 / 20 kHz		
Design	Male connector		
U, V, W, PE	Yes		
Shield connection	Yes		
Terminal connection cross section	1.55 to 6 mm ²		
Flexible and fine wire lines	1.55 to 6 mm ²		
With wire end sleeves	1.55 to 6 mm ²		
Approbation data	24 to 8 AWG		
UL/C-UL-US	24 to 8 AWG		
CSA	24 to 8 AWG		
Max. motor line length depending on the switching frequency	25 m		
Switching frequency 5 kHz	25 m		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		

Servo drives, 2.2 to 8.8 A, 480 VAC (2-axis modules)

Technical data

8EI2X2HWD10.XXXX-1

8EI4X5HWD10.XXXX-1

8EI8X8HWD10.XXXX-1

Motor holding brake connection

Quantity	2
Output voltage ⁹⁾	Depends on the input voltage on the X2 connector
Continuous current	1.3 A
Max. internal resistance	0.25 Ω
Max. extinction energy per switching operation	1.5 Ws
Response threshold for open line monitoring	Approx. 30 mA

Braking resistors

Peak power int. / ext.	7 kW / 25 kW
Continuous power int. / ext.	150 W / 2 kW
Minimum braking resistance (ext.)	25 Ω

Encoder interfaces

Quantity	2
Type	EnDat 2.2
Connections	8-pin female mini I/O connector
Encoder supply	
Output voltage	Typ. 12 V
Load capability	300 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	In preparation

Operating conditions

EN 60529 protection	IP20
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Mechanical characteristics

Dimensions	
Width	66 mm
Height	374 mm
Depth	
Wall mounting	258.5 mm (without 8EXA front cover: 261 mm)
Weight	4 kg

¹⁾ An upstream filter must be connected (e.g. 8B0F0160H000.A00-1).

²⁾ The current consumption depends on the configuration of the ACOPOS P3 module.

³⁾ Valid in the following conditions: 560 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁴⁾ The total continuous power of the motor connectors is not permitted to exceed 4 kW.

⁵⁾ The total peak power of all motor connectors is not permitted to exceed 2.5 kW.

⁶⁾ The total peak power of all motor connectors is not permitted to exceed 5 kW.

⁷⁾ The total peak power of all motor connectors is not permitted to exceed 10 kW.

⁸⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified input voltage and wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

Servo drives, 2.2 to 8.8 A, 230 VAC (3-axis modules)

Technical data



8EI2X2MWT10.XXXX-1

8EI4X5MWT10.XXXX-1

8EI8X8MWT10.XXXX-1

Power mains connector

Mains input voltage	1x 110 VAC to 230 VAC ±10% 3x 200 VAC to 230 VAC ±10%		
Installed load	Max. 1.25 kVA	Max. 2.5 kVA	Max. 5 kVA
Starting current	In preparation		
Reduction of continuous current according to the ambient temperature above 40°C	Device-dependent		
Integrated line filter in accordance with EN 61800-3, Category C3	No ¹⁾		
Power loss at max. device power without braking resistor	In preparation		

DC bus connection

DC bus capacitance	1880 µF		
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24 VDC supply

Input capacitance	In preparation		
Current consumption	1.2 A + current for motor holding brake ²⁾		

Motor connection

Quantity	3		
Continuous power per motor connection ³⁾	0.5 / 0.5 / 0.5 kW	1 / 1 / 1 kW ⁴⁾	2 / 2 / 2 kW ⁴⁾
Continuous current per motor connection ³⁾	2.2 / 2.2 / 2.2 A _{eff}	4.5 / 4.5 / 4.5 A _{eff}	8.8 / 8.8 / 8.8 A _{eff}
Reduction of continuous current depending on the switching frequency			
Switching frequency 5 kHz	In preparation		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		
Reduction of continuous current depending on the installation elevation			
Starting at 500 m above sea level	0.22 A _{eff} per 1000 m	0.45 A _{eff} per 1000 m	0.88 A _{eff} per 1000 m
Peak current per motor connection	6 / 6 / 6 A _{eff}	12 / 12 / 12 A _{eff}	24 / 24 / 24 A _{eff}
Peak power output	1.25 kW ⁵⁾	2.5 kW ⁶⁾	5 kW ⁷⁾
Possible switching frequencies ⁸⁾	5 / 10 / 20 kHz		
Design			
U, V, W, PE	Male connector		
Shield connection	Yes		
Terminal connection cross section			
Flexible and fine wire lines			
With wire end sleeves	1.55 to 6 mm ²		
Approbation data			
UL/C-UL-US	24 to 8 AWG		
CSA	24 to 8 AWG		
Max. motor line length depending on the switching frequency			
Switching frequency 5 kHz	25 m		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		

Servo drives, 2.2 to 8.8 A, 230 VAC (3-axis modules)

Technical data

8EI2X2MWT10.XXXX-1

8EI4X5MWT10.XXXX-1

8EI8X8MWT10.XXXX-1

Motor holding brake connection

Quantity	3
Output voltage ⁹⁾	Depends on the input voltage on the X2 connector
Continuous current	1.3 A
Max. internal resistance	0.25 Ω
Max. extinction energy per switching operation	1.5 Ws
Response threshold for open line monitoring	Approx. 30 mA

Braking resistors

Peak power int. / ext.	1.5 kW / 11 kW
Continuous power int. / ext.	150 W / 970 W
Minimum braking resistance (ext.)	12 Ω

Encoder interfaces

Quantity	3
Type	EnDat 2.2
Connections	8-pin female mini I/O connector
Encoder supply	
Output voltage	Typ. 12 V
Load capability	300 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	In preparation

Operating conditions

EN 60529 protection	IP20
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Mechanical characteristics

Dimensions	
Width	66 mm
Height	374 mm
Depth	
Wall mounting	258.5 mm (without 8EXA front cover: 261 mm)
Weight	4 kg

¹⁾ An upstream filter must be connected (e.g. 8B0F0160H000.A00-1).

²⁾ The current consumption depends on the configuration of the ACOPOS P3 module.

³⁾ Valid in the following conditions: 325 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁴⁾ The total continuous power of the motor connectors is not permitted to exceed 2 kW.

⁵⁾ The total peak power of all motor connectors is not permitted to exceed 1.25 kW.

⁶⁾ The total peak power of all motor connectors is not permitted to exceed 2.5 kW.

⁷⁾ The total peak power of all motor connectors is not permitted to exceed 5 kW.

⁸⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified input voltage and wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

Servo drives, 2.2 to 8.8 A, 480 VAC (3-axis modules)

Technical data



8EI2X2HWT10.XXXX-1

8EI4X5HWT10.XXXX-1

8EI8X8HWT10.XXXX-1

Power mains connector

Mains input voltage	3x 200 VAC to 480 VAC ±10%		
Installed load	Max. 2.5 kVA	Max. 5 kVA	Max. 10 kVA
Starting current	In preparation		
Reduction of continuous current according to the ambient temperature above 40°C	Device-dependent		
Integrated line filter in accordance with EN 61800-3, Category C3	No ¹⁾		
Power loss at max. device power without braking resistor	In preparation		

DC bus connection

DC bus capacitance	470 µF
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24 VDC supply

Input capacitance	In preparation
Current consumption	1.2 A + current for motor holding brake ²⁾

Motor connection

Quantity	3		
Continuous power per motor connection ³⁾	1 / 1 / 1 kW	2 / 2 / 2 kW ⁴⁾	4 / 4 / 4 kW ⁴⁾
Continuous current per motor connection ³⁾	2.2 / 2.2 / 2.2 A _{eff}	4.5 / 4.5 / 4.5 A _{eff}	8.8 / 8.8 / 8.8 A _{eff}
Reduction of continuous current depending on the switching frequency			
Switching frequency 5 kHz	In preparation		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		
Reduction of continuous current depending on the installation elevation			
Starting at 500 m above sea level	0.22 A _{eff} per 1000 m	0.45 A _{eff} per 1000 m	0.88 A _{eff} per 1000 m
Peak current per motor connection	6 / 6 / 6 A _{eff}	12 / 12 / 12 A _{eff}	24 / 24 / 24 A _{eff}
Peak power output	2.5 kW ⁵⁾	5 kW ⁶⁾	10 kW ⁷⁾
Possible switching frequencies ⁸⁾	5 / 10 / 20 kHz		
Design			
U, V, W, PE	Male connector		
Shield connection	Yes		
Terminal connection cross section			
Flexible and fine wire lines			
With wire end sleeves	1.55 to 6 mm ²		
Approbation data			
UL/C-UL-US	24 to 8 AWG		
CSA	24 to 8 AWG		
Max. motor line length depending on the switching frequency			
Switching frequency 5 kHz	25 m		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		

Servo drives, 2.2 to 8.8 A, 480 VAC (3-axis modules)

Technical data

8EI2X2HWT10.XXXXX-1

8EI4X5HWT10.XXXXX-1

8EI8X8HWT10.XXXXX-1

Motor holding brake connection

Quantity	3
Output voltage ⁹⁾	Depends on the input voltage on the X2 connector
Continuous current	1.3 A
Max. internal resistance	0.25 Ω
Max. extinction energy per switching operation	1.5 Ws
Response threshold for open line monitoring	Approx. 30 mA

Braking resistors

Peak power int. / ext.	7 kW / 25 kW
Continuous power int. / ext.	150 W / 2 kW
Minimum braking resistance (ext.)	25 Ω

Encoder interfaces

Quantity	3
Type	EnDat 2.2
Connections	8-pin female mini I/O connector
Encoder supply	
Output voltage	Typ. 12 V
Load capability	300 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	In preparation

Operating conditions

EN 60529 protection	IP20
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Mechanical characteristics

Dimensions	
Width	66 mm
Height	374 mm
Depth	
Wall mounting	258.5 mm (without 8EXA front cover: 261 mm)
Weight	4 kg

¹⁾ An upstream filter must be connected (e.g. 8B0F0160H000.A00-1).

²⁾ The current consumption depends on the configuration of the ACOPOS P3 module.

³⁾ Valid in the following conditions: 560 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁴⁾ The total continuous power of the motor connectors is not permitted to exceed 4 kW.

⁵⁾ The total peak power of all motor connectors is not permitted to exceed 2.5 kW.

⁶⁾ The total peak power of all motor connectors is not permitted to exceed 5 kW.

⁷⁾ The total peak power of all motor connectors is not permitted to exceed 10 kW.

⁸⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified input voltage and wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

SafeMOTION servo drives, 1.6 to 8.8 A, 230 VAC (1-axis modules)

Technical data



8E11X6MWSS0.XXXX-1

8E12X2MWSS0.XXXX-1

8E14X5MWSS0.XXXX-1

8E18X8MWSS0.XXXX-1

Power mains connector

Mains input voltage	1x 110 VAC to 230 VAC ±10% 3x 200 VAC to 230 VAC ±10%			
Installed load	Max. 1 kVA	Max. 1.25 kVA	Max. 2.5 kVA	Max. 5 kVA
Starting current	In preparation			
Reduction of continuous current according to the ambient temperature above 40°C	Device-dependent			
Integrated line filter in accordance with EN 61800-3, Category C3	No ¹⁾			
Power loss at max. device power without braking resistor	In preparation			

DC bus connection

DC bus capacitance	1880 µF			
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24 VDC supply

Input capacitance	In preparation			
Current consumption	0.9 A + current for motor holding brake ²⁾			

Motor connection

Quantity	1			
Continuous power per motor connection ³⁾	0.4 kW	0.5 kW	1 kW	2 kW
Continuous current per motor connection ³⁾	1.6 A _{eff}	2.2 A _{eff}	4.5 A _{eff}	8.8 A _{eff}
Reduction of continuous current depending on the switching frequency	In preparation			
Switching frequency 5 kHz	In preparation			
Switching frequency 10 kHz	In preparation			
Switching frequency 20 kHz	In preparation			
Reduction of continuous current depending on the installation elevation	In preparation			
Starting at 500 m above sea level	0.16 A _{eff} per 1000 m	0.22 A _{eff} per 1000 m	0.45 A _{eff} per 1000 m	0.88 A _{eff} per 1000 m
Peak current per motor connection	4.5 A _{eff}	6 A _{eff}	12 A _{eff}	24 A _{eff}
Peak power output	0.9 kW	1.25 kW	2.5 kW	5 kW
Possible switching frequencies ⁴⁾	5 / 10 / 20 kHz			
Design	Male connector			
U, V, W, PE	Yes			
Shield connection	Yes			
Terminal connection cross section	1.55 to 6 mm ²			
Flexible and fine wire lines	1.55 to 6 mm ²			
With wire end sleeves	1.55 to 6 mm ²			
Approbation data	24 to 8 AWG			
UL/C-UL-US	24 to 8 AWG			
CSA	24 to 8 AWG			
Max. motor line length depending on the switching frequency	25 m			
Switching frequency 5 kHz	25 m			
Switching frequency 10 kHz	In preparation			
Switching frequency 20 kHz	In preparation			

SafeMOTION servo drives, 1.6 to 8.8 A, 230 VAC (1-axis modules)

Technical data

8E11X6MWSS0.XXXX-1

8E12X2MWSS0.XXXX-1

8E14X5MWSS0.XXXX-1

8E18X8MWSS0.XXXX-1

Motor holding brake connection

Quantity	1
Output voltage ⁵⁾	Depends on the input voltage on the X2 connector
Continuous current	1.3 A
Max. internal resistance	0.25 Ω
Max. extinction energy per switching operation	1.5 Ws
Response threshold for open line monitoring	Approx. 30 mA

Braking resistors

Peak power int. / ext.	1.5 kW / 11 kW
Continuous power int. / ext.	100 W / 970 W
Minimum braking resistance (ext.)	12 Ω

Encoder interfaces

Quantity	1
Type	EnDat 2.2
Connections	8-pin female mini I/O connector
Encoder supply	
Output voltage	Typ. 12 V
Load capability	300 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	In preparation

Operating conditions

EN 60529 protection	IP20
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Mechanical characteristics

Dimensions	
Width	66 mm
Height	290 mm
Depth	
Wall mounting	258.5 mm (without 8EXA front cover: 261 mm)
Weight	3.2 kg

¹⁾ An upstream filter must be connected (e.g. 8B0F0160H000.A00-1).

²⁾ The current consumption depends on the configuration of the ACOPOS P3 module.

³⁾ Valid in the following conditions: 325 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁴⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁵⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified input voltage and wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

SafeMOTION servo drives, 1.6 to 8.8 A, 480 VAC (1-axis modules)

Technical data



8EI1X6HWSS0.XXXX-1

8EI2X2HWSS0.XXXX-1

8EI4X5HWSS0.XXXX-1

8EI8X8HWSS0.XXXX-1

Power mains connector

Mains input voltage	3x 200 VAC to 480 VAC ±10%			
Installed load	Max. 1.8 kVA	Max. 2.5 kVA	Max. 5 kVA	Max. 10 kVA
Starting current	In preparation			
Reduction of continuous current according to the ambient temperature above 40°C	Device-dependent			
Integrated line filter in accordance with EN 61800-3, Category C3	No ¹⁾			
Power loss at max. device power without braking resistor	In preparation			

DC bus connection

DC bus capacitance	470 µF
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24 VDC supply

Input capacitance	In preparation
Current consumption	0.9 A + current for motor holding brake ²⁾

Motor connection

Quantity	1			
Continuous power per motor connection ³⁾	0.7 kW	1 kW	2 kW	4 kW
Continuous current per motor connection ³⁾	1.6 A _{eff}	2.2 A _{eff}	4.5 A _{eff}	8.8 A _{eff}
Reduction of continuous current depending on the switching frequency	In preparation			
Switching frequency 5 kHz	In preparation			
Switching frequency 10 kHz	In preparation			
Switching frequency 20 kHz	In preparation			
Reduction of continuous current depending on the installation elevation	In preparation			
Starting at 500 m above sea level	0.16 A _{eff} per 1000 m	0.22 A _{eff} per 1000 m	0.45 A _{eff} per 1000 m	0.88 A _{eff} per 1000 m
Peak current per motor connection	4.5 A _{eff}	6 A _{eff}	12 A _{eff}	24 A _{eff}
Peak power output	1.9 kW	2.5 kW	5 kW	10 kW
Possible switching frequencies ⁴⁾	5 / 10 / 20 kHz			
Design	Male connector			
U, V, W, PE	Male connector			
Shield connection	Yes			
Terminal connection cross section	In preparation			
Flexible and fine wire lines	In preparation			
With wire end sleeves	1.55 to 6 mm ²			
Approbation data	In preparation			
UL/C-UL-US	24 to 8 AWG			
CSA	24 to 8 AWG			
Max. motor line length depending on the switching frequency	In preparation			
Switching frequency 5 kHz	25 m			
Switching frequency 10 kHz	In preparation			
Switching frequency 20 kHz	In preparation			

SafeMOTION servo drives, 1.6 to 8.8 A, 480 VAC (1-axis modules)

Technical data

8EI1X6HWSS0.XXXX-1

8EI2X2HWSS0.XXXX-1

8EI4X5HWSS0.XXXX-1

8EI8X8HWSS0.XXXX-1

Motor holding brake connection

Quantity	1
Output voltage ⁵⁾	Depends on the input voltage on the X2 connector
Continuous current	1.3 A
Max. internal resistance	0.25 Ω
Max. extinction energy per switching operation	1.5 Ws
Response threshold for open line monitoring	Approx. 30 mA

Braking resistors

Peak power int. / ext.	7 kW / 25 kW
Continuous power int. / ext.	100 W / 2 kW
Minimum braking resistance (ext.)	25 Ω

Encoder interfaces

Quantity	1
Type	EnDat 2.2
Connections	8-pin female mini I/O connector
Encoder supply	
Output voltage	Typ. 12 V
Load capability	300 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	In preparation

Operating conditions

EN 60529 protection	IP20
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Mechanical characteristics

Dimensions	
Width	66 mm
Height	290 mm
Depth	
Wall mounting	258.5 mm (without 8EXA front cover: 261 mm)
Weight	3.2 kg

¹⁾ An upstream filter must be connected (e.g. 8B0F0160H000.A00-1).

²⁾ The current consumption depends on the configuration of the ACOPOS P3 module.

³⁾ Valid in the following conditions: 560 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁴⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁵⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified input voltage and wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

SafeMOTION servo drives, 2.2 to 8.8 A, 230 VAC (2-axis modules)

Technical data



8EI2X2MWD50.XXXX-1

8EI4X5MWD50.XXXX-1

8EI8X8MWD50.XXXX-1

Power mains connector

Mains input voltage	1x 110 VAC to 230 VAC ±10% 3x 200 VAC to 230 VAC ±10%		
Installed load	Max. 1.25 kVA	Max. 2.5 kVA	Max. 5 kVA
Starting current	In preparation		
Reduction of continuous current according to the ambient temperature above 40°C	Device-dependent		
Integrated line filter in accordance with EN 61800-3, Category C3	No ¹⁾		
Power loss at max. device power without braking resistor	In preparation		

DC bus connection

DC bus capacitance	1880 µF
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24 VDC supply

Input capacitance	In preparation
Current consumption	1.2 A + current for motor holding brake ²⁾

Motor connection

Quantity	2		
Continuous power per motor connection ³⁾	0.5 / 0.5 kW	1 / 1 kW	2 / 2 kW ⁴⁾
Continuous current per motor connection ³⁾	2.2 / 2.2 A _{eff}	4.5 / 4.5 A _{eff}	8.8 / 8.8 A _{eff}
Reduction of continuous current depending on the switching frequency			
Switching frequency 5 kHz	In preparation		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		
Reduction of continuous current depending on the installation elevation			
Starting at 500 m above sea level	0.22 A _{eff} per 1000 m	0.45 A _{eff} per 1000 m	0.88 A _{eff} per 1000 m
Peak current per motor connection	6 / 6 A _{eff}	12 / 12 A _{eff}	24 / 24 A _{eff}
Peak power output	1.25 kW ⁵⁾	2.5 kW ⁶⁾	5 kW ⁷⁾
Possible switching frequencies ⁸⁾	5 / 10 / 20 kHz		
Design			
U, V, W, PE	Male connector		
Shield connection	Yes		
Terminal connection cross section			
Flexible and fine wire lines			
With wire end sleeves	1.55 to 6 mm ²		
Approbation data			
UL/C-UL-US	24 to 8 AWG		
CSA	24 to 8 AWG		
Max. motor line length depending on the switching frequency			
Switching frequency 5 kHz	25 m		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		

SafeMOTION servo drives, 2.2 to 8.8 A, 230 VAC (2-axis modules)

Technical data

8EI2X2MWDS0.XXXX-1

8EI4X5MWDS0.XXXX-1

8EI8X8MWDS0.XXXX-1

Motor holding brake connection

Quantity	2
Output voltage ⁹⁾	Depends on the input voltage on the X2 connector
Continuous current	1.3 A
Max. internal resistance	0.25 Ω
Max. extinction energy per switching operation	1.5 Ws
Response threshold for open line monitoring	Approx. 30 mA

Braking resistors

Peak power int. / ext.	1.5 kW / 11 kW
Continuous power int. / ext.	150 W / 970 W
Minimum braking resistance (ext.)	12 Ω

Encoder interfaces

Quantity	2
Type	EnDat 2.2
Connections	8-pin female mini I/O connector
Encoder supply	
Output voltage	Typ. 12 V
Load capability	300 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	In preparation

Operating conditions

EN 60529 protection	IP20
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Mechanical characteristics

Dimensions	
Width	66 mm
Height	374 mm
Depth	
Wall mounting	258.5 mm (without 8EXA front cover: 261 mm)
Weight	4 kg

¹⁾ An upstream filter must be connected (e.g. 8B0F0160H000.A00-1).

²⁾ The current consumption depends on the configuration of the ACOPOS P3 module.

³⁾ Valid in the following conditions: 325 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁴⁾ The total continuous power of the motor connectors is not permitted to exceed 2 kW.

⁵⁾ The total peak power of all motor connectors is not permitted to exceed 1.25 kW.

⁶⁾ The total peak power of all motor connectors is not permitted to exceed 2.5 kW.

⁷⁾ The total peak power of all motor connectors is not permitted to exceed 5 kW.

⁸⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified input voltage and wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

SafeMOTION servo drives, 2.2 to 8.8 A, 480 VAC (2-axis modules)

Technical data



8EI2X2HWDS0.XXXX-1

8EI4X6HWDS0.XXXX-1

8EI8X8HWDS0.XXXX-1

Power mains connector

Mains input voltage	3x 200 VAC to 480 VAC $\pm 10\%$		
Installed load	Max. 2.5 kVA	Max. 5 kVA	Max. 10 kVA
Starting current	In preparation		
Reduction of continuous current according to the ambient temperature above 40°C	Device-dependent		
Integrated line filter in accordance with EN 61800-3, Category C3	No ¹⁾		
Power loss at max. device power without braking resistor	In preparation		

DC bus connection

DC bus capacitance	470 μ F
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24 VDC supply

Input capacitance	In preparation
Current consumption	1.2 A + current for motor holding brake ²⁾

Motor connection

Quantity	2		
Continuous power per motor connection ³⁾	1 / 1 kW	2 / 2 kW	2 / 2 kW ⁴⁾
Continuous current per motor connection ³⁾	2.2 / 2.2 A _{eff}	4.5 / 4.5 A _{eff}	8.8 / 8.8 A _{eff}
Reduction of continuous current depending on the switching frequency	In preparation		
Switching frequency 5 kHz	In preparation		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		
Reduction of continuous current depending on the installation elevation	In preparation		
Starting at 500 m above sea level	0.22 A _{eff} per 1000 m	0.45 A _{eff} per 1000 m	0.88 A _{eff} per 1000 m
Peak current per motor connection	6 / 6 A _{eff}	12 / 12 A _{eff}	24 / 24 A _{eff}
Peak power output	2.5 kW ⁵⁾	5 kW ⁶⁾	10 kW ⁷⁾
Possible switching frequencies ⁸⁾	5 / 10 / 20 kHz		
Design	Male connector		
U, V, W, PE	Male connector		
Shield connection	Yes		
Terminal connection cross section	1.55 to 6 mm ²		
Flexible and fine wire lines	1.55 to 6 mm ²		
With wire end sleeves	1.55 to 6 mm ²		
Approbation data	24 to 8 AWG		
UL/C-UL-US	24 to 8 AWG		
CSA	24 to 8 AWG		
Max. motor line length depending on the switching frequency	25 m		
Switching frequency 5 kHz	25 m		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		

SafeMOTION servo drives, 2.2 to 8.8 A, 480 VAC (2-axis modules)

Technical data

8EI2X2HWDS0.XXXX-1

8EI4X5HWDS0.XXXX-1

8EI8X8HWDS0.XXXX-1

Motor holding brake connection

Quantity	2
Output voltage ⁹⁾	Depends on the input voltage on the X2 connector
Continuous current	1.3 A
Max. internal resistance	0.25 Ω
Max. extinction energy per switching operation	1.5 Ws
Response threshold for open line monitoring	Approx. 30 mA

Braking resistors

Peak power int. / ext.	7 kW / 25 kW
Continuous power int. / ext.	150 W / 2 kW
Minimum braking resistance (ext.)	25 Ω

Encoder interfaces

Quantity	2
Type	EnDat 2.2
Connections	8-pin female mini I/O connector
Encoder supply	
Output voltage	Typ. 12 V
Load capability	300 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	In preparation

Operating conditions

EN 60529 protection	IP20
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Mechanical characteristics

Dimensions	
Width	66 mm
Height	374 mm
Depth	
Wall mounting	258.5 mm (without 8EXA front cover: 261 mm)
Weight	4 kg

¹⁾ An upstream filter must be connected (e.g. 8B0F0160H000.A00-1).

²⁾ The current consumption depends on the configuration of the ACOPOS P3 module.

³⁾ Valid in the following conditions: 560 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁴⁾ The total continuous power of the motor connectors is not permitted to exceed 2 kW.

⁵⁾ The total peak power of all motor connectors is not permitted to exceed 2.5 kW.

⁶⁾ The total peak power of all motor connectors is not permitted to exceed 5 kW.

⁷⁾ The total peak power of all motor connectors is not permitted to exceed 10 kW.

⁸⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified input voltage and wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

SafeMOTION servo drives, 2.2 to 8.8 A, 230 VAC (3-axis modules)

Technical data



8EI2X2MWT50.XXXX-1

8EI4X5MWT50.XXXX-1

8EI8X8MWT50.XXXX-1

Power mains connector

Mains input voltage	1x 110 VAC to 230 VAC ±10% 3x 200 VAC to 230 VAC ±10%		
Installed load	Max. 1.25 kVA	Max. 2.5 kVA	Max. 5 kVA
Starting current	In preparation		
Reduction of continuous current according to the ambient temperature above 40°C	Device-dependent		
Integrated line filter in accordance with EN 61800-3, Category C3	No ¹⁾		
Power loss at max. device power without braking resistor	In preparation		

DC bus connection

DC bus capacitance	1880 µF
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24 VDC supply

Input capacitance	In preparation
Current consumption	1.2 A + current for motor holding brake ²⁾

Motor connection

Quantity	3		
Continuous power per motor connection ³⁾	0.5 / 0.5 / 0.5 kW	1 / 1 / 1 kW ⁴⁾	2 / 2 / 2 kW ⁴⁾
Continuous current per motor connection ³⁾	2.2 / 2.2 / 2.2 A _{eff}	4.5 / 4.5 / 4.5 A _{eff}	8.8 / 8.8 / 8.8 A _{eff}
Reduction of continuous current depending on the switching frequency			
Switching frequency 5 kHz	In preparation		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		
Reduction of continuous current depending on the installation elevation			
Starting at 500 m above sea level	0.22 A _{eff} per 1000 m	0.45 A _{eff} per 1000 m	0.88 A _{eff} per 1000 m
Peak current per motor connection	6 / 6 / 6 A _{eff}	12 / 12 / 12 A _{eff}	24 / 24 / 24 A _{eff}
Peak power output	1.25 kW ⁵⁾	2.5 kW ⁶⁾	5 kW ⁷⁾
Possible switching frequencies ⁸⁾	5 / 10 / 20 kHz		
Design			
U, V, W, PE	Male connector		
Shield connection	Yes		
Terminal connection cross section			
Flexible and fine wire lines			
With wire end sleeves	1.55 to 6 mm ²		
Approbation data			
UL/C-UL-US	24 to 8 AWG		
CSA	24 to 8 AWG		
Max. motor line length depending on the switching frequency			
Switching frequency 5 kHz	25 m		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		

SafeMOTION servo drives, 2.2 to 8.8 A, 230 VAC (3-axis modules)

Technical data



8EI2X2MWTS0.XXXX-1

8EI4X5MWTS0.XXXX-1

8EI8X8MWTS0.XXXX-1

Motor holding brake connection

Quantity	3
Output voltage ⁹⁾	Depends on the input voltage on the X2 connector
Continuous current	1.3 A
Max. internal resistance	0.25 Ω
Max. extinction energy per switching operation	1.5 Ws
Response threshold for open line monitoring	Approx. 30 mA

Braking resistors

Peak power int. / ext.	1.5 kW / 11 kW
Continuous power int. / ext.	150 W / 970 W
Minimum braking resistance (ext.)	12 Ω

Encoder interfaces

Quantity	3
Type	EnDat 2.2
Connections	8-pin female mini I/O connector
Encoder supply	
Output voltage	Typ. 12 V
Load capability	300 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	In preparation

Operating conditions

EN 60529 protection	IP20
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Mechanical characteristics

Dimensions	
Width	66 mm
Height	374 mm
Depth	
Wall mounting	258.5 mm (without 8EXA front cover: 261 mm)
Weight	4 kg

¹⁾ An upstream filter must be connected (e.g. 8B0F0160H000.A00-1).

²⁾ The current consumption depends on the configuration of the ACOPOS P3 module.

³⁾ Valid in the following conditions: 325 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁴⁾ The total continuous power of the motor connectors is not permitted to exceed 2 kW.

⁵⁾ The total peak power of all motor connectors is not permitted to exceed 1.25 kW.

⁶⁾ The total peak power of all motor connectors is not permitted to exceed 2.5 kW.

⁷⁾ The total peak power of all motor connectors is not permitted to exceed 5 kW.

⁸⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified input voltage and wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

SafeMOTION servo drives, 2.2 to 8.8 A, 480 VAC (3-axis modules)

Technical data



8EI2X2HWTS0.XXXX-1

8EI4X5HWTS0.XXXX-1

8EI8X8HWTS0.XXXX-1

Power mains connector

Mains input voltage	3x 200 VAC to 480 VAC ±10%		
Installed load	Max. 2.5 kVA	Max. 5 kVA	Max. 10 kVA
Starting current	In preparation		
Reduction of continuous current according to the ambient temperature above 40°C	Device-dependent		
Integrated line filter according to EN 61800-3, Category C3	No ¹⁾		
Power loss at max. device power without braking resistor	In preparation		

DC bus connection

DC bus capacitance	470 µF
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24 VDC supply

Input capacitance	In preparation
Current consumption	1.2 A + current for motor holding brake ²⁾

Motor connection

Quantity	3		
Continuous power per motor connection ³⁾	1 / 1 / 1 kW	2 / 2 / 2 kW ⁴⁾	4 / 4 / 4 kW ⁴⁾
Continuous current per motor connection ³⁾	2.2 / 2.2 / 2.2 A _{eff}	4.5 / 4.5 / 4.5 A _{eff}	8.8 / 8.8 / 8.8 A _{eff}
Reduction of continuous current depending on the switching frequency	In preparation		
Switching frequency 5 kHz	In preparation		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		
Reduction of continuous current depending on the installation elevation	In preparation		
Starting at 500 m above sea level	0.22 A _{eff} per 1000 m	0.45 A _{eff} per 1000 m	0.88 A _{eff} per 1000 m
Peak current per motor connection	6 / 6 / 6 A _{eff}	12 / 12 / 12 A _{eff}	24 / 24 / 24 A _{eff}
Peak power output	2.5 kW ⁵⁾	5 kW ⁶⁾	10 kW ⁷⁾
Possible switching frequencies ⁸⁾	5 / 10 / 20 kHz		
Design	Male connector		
U, V, W, PE	Yes		
Shield connection	Yes		
Terminal connection cross section	1.55 to 6 mm ²		
Flexible and fine wire lines	1.55 to 6 mm ²		
With wire end sleeves	1.55 to 6 mm ²		
Approval data	24 to 8 AWG		
UL/C-UL-US	24 to 8 AWG		
CSA	24 to 8 AWG		
Max. motor line length depending on the switching frequency	25 m		
Switching frequency 5 kHz	In preparation		
Switching frequency 10 kHz	In preparation		
Switching frequency 20 kHz	In preparation		

SafeMOTION servo drives, 2.2 to 8.8 A, 480 VAC (3-axis modules)

Technical data

8EI2X2HWTS0.XXXX-1

8EI4X5HWTS0.XXXX-1

8EI8X8HWTS0.XXXX-1

Motor holding brake connection

Quantity	3
Output voltage ⁹⁾	Depends on the input voltage on the X2 connector
Continuous current	1.3 A
Max. internal resistance	0.25 Ω
Max. extinction energy per switching operation	1.5 Ws
Response threshold for open line monitoring	Approx. 30 mA

Braking resistors

Peak power int. / ext.	7 kW / 25 kW
Continuous power int. / ext.	150 W / 2 kW
Minimum braking resistance (ext.)	25 Ω

Encoder interfaces

Quantity	3
Type	EnDat 2.2
Connections	8-pin female mini I/O connector
Encoder supply	
Output voltage	Typ. 12 V
Load capability	300 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	In preparation

Operating conditions

EN 60529 protection	IP20
---------------------	------

Mechanical characteristics

Dimensions	
Width	66 mm
Height	374 mm
Depth	
Wall mounting	258.5 mm (without 8EXA front cover: 261 mm)
Weight	4 kg

¹⁾ An upstream filter must be connected (e.g. 8B0F0160H000.A00-1).

²⁾ The current consumption depends on the configuration of the ACOPOS P3 module.

³⁾ Valid in the following conditions: 560 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁴⁾ The total continuous power of the motor connectors is not permitted to exceed 4 kW.

⁵⁾ The total peak power of all motor connectors is not permitted to exceed 2.5 kW.

⁶⁾ The total peak power of all motor connectors is not permitted to exceed 5 kW.

⁷⁾ The total peak power of all motor connectors is not permitted to exceed 10 kW.

⁸⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified input voltage and wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

Display modules

8EAD0000.000-1



An 8EAD display module can be plugged into the X9 interface of an 8EI servo drive to display information about the drive and set its parameters:

- Viewing/setting the POWERLINK node number
- Viewing the operating system version of the 8EI servo drive
- Viewing general information about the 8EI servo drive

The four keys on the front of the display module are used to navigate the menu and set parameters.

Display

Type	LCD
Colors	Black/White
Resolution	128 x 64

Keys

Type	Short stroke keys
Quantity	4

Operating conditions

EN 60529 protection	IP20
---------------------	------

Mechanical characteristics

Dimensions	
Width	58 mm
Height	65 mm
Depth	19 mm
Weight	53 g

Plug-in modules

8EAC0122.001-1, 8EAC0122.003-1



- Resolver interface for installation in ACOPOS P3 servo drives
- Encoder monitoring
- High resolution

General information	8EAC0122.001-1	8EAC0122.003-1
Short description	-	3 resolver interfaces in one module
Module type		ACOPOS P3 plug-in module
Slot		Slot 1
Max. power consumption		In preparation
Encoder connection	8EAC0122.001-1	8EAC0122.003-1
Module-side connection ¹⁾		8-pin female mini I/O connector
Status indicators		None
Encoder monitoring		Yes
Max. encoder cable length		100 m
Encoder supply	8EAC0122.001-1	8EAC0122.003-1
Output voltage		Typ. 3 V _{eff}
Output current		Max. 50 mA _{eff}
Frequency		10 kHz
Protective measures		
Overload protection		Yes
Short circuit protection		Yes
Position	8EAC0122.001-1	8EAC0122.003-1
Resolution @ $\dot{u} = 0.5$		Number of pole pairs * 22600
Analog inputs	8EAC0122.001-1	8EAC0122.003-1
Digital converter resolution		14-bit
Input impedance		10.4 k Ω - j8 k Ω
Input voltage		Resolver transformation ratio: 0.5 \pm 10%
Common-mode voltage		Max. \pm 12 V
Signal transmission		Differential signals

¹⁾ The resolver must be wired using a cable with a single shield and twisted pair signal lines.

1.5 mm² motor hybrid cables

Technical data



8ECH0005.1111A-0

8ECH0007.1111A-0

8ECH0010.1111A-0

8ECH0015.1111A-0

8ECH0020.1111A-0

8ECH0025.1111A-0

General information

Cable cross section	4x 1.5 mm ² + 2x 0.75 mm ² + (2x 1x 0.24 mm ² + 2x 2x 0.09 mm ²)
Certification	
CE	Yes

Cable construction

Power lines	
Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Design	Copper stranded wire
Diameter	1.5 mm ²
Shield	No
Stranding	No
Outer sheathing	
Labeling	B&R 4x1.5 + 2x0.75 + (2x2xAWG28 + 2x1xAWG24) * E130266 * UL AWM STYLE 21223 * AWM I/II A/B 80°C 1000V FT1

Connector

Type	7-pin female speedtec motor connector
Connection cycles	>50
Contacts	7
Additional connectors	Mini I/O encoder connector, 8-pin male Connection cycles: >50 Contacts: 8
EN 60529 protection	Protection in accordance with EN 60529: IP20 when connected IP67 when connected

Electrical characteristics

Test voltage	
Wire/Wire	4 kV
Wire/Shield	4 kV
Conductor resistance	
Power lines	≤0.07 Ω
Supply lines	≤0.42 Ω
Signal lines	0.75 mm ² : ≤1.10 Ω; 0.09 mm ² : ≤0.13 Ω
Insulation resistance	>40 GΩ
Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	20.2 A
Installed in conduit or cable duct	17.8 A
Installed in cable tray	20.9 A

Environmental conditions

Temperature	
Moving	-10 to 80°C
Static	-40 to 90°C

1.5 mm² motor hybrid cables

Technical data

8ECH0005.1111A-0

8ECH0007.1111A-0

8ECH0010.1111A-0

8ECH0015.1111A-0

8ECH0020.1111A-0

8ECH0025.1111A-0

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	13 mm ±0.4 mm					
Flex radius						
Single bend	>40 mm					
Moving	≥100 mm					
Drag chain data						
Acceleration	4 m/s ²					
Flex cycles	3,000,000					
Speed	4 m/s					
Weight	1.31 kg	1.78 kg	2.48 kg	3.65 kg	4.82 kg	6 kg

1.5 mm² motor cables

Technical data



8ECM0005.1111C-0

8ECM0007.1111C-0

8ECM0010.1111C-0

8ECM0015.1111C-0

8ECM0020.1111C-0

8ECM0025.1111C-0

General information

Cable cross section	4x 1.5 mm ² + 2x 2x 0.75 mm ²
Certification	
CE	Yes

Cable construction

Power lines	
Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	1.5 mm ²
Shield	No
Stranding	No
Outer sheathing	
Labeling	BERNECKER + RAINER 4x1.5+2x2x0.75 FLEX UL AWM STYLE 20234 80°C 1000 V E63216 CSA AWM I/II A/B 90°C 1000 V FT2 LL46064

Connector

Type	8-pin female speedtec motor connector
Connection cycles	>50
Contacts	8 (4 power and 4 signal contacts)
EN 60529 protection	IP67 when connected

Electrical characteristics

Test voltage						
Wire/Wire	3 kV					
Wire/Shield	3 kV					
Conductor resistance						
Power lines	≤0.07 Ω	≤0.1 Ω	≤0.14 Ω	≤0.21 Ω	≤0.28 Ω	≤0.35 Ω
Signal lines	≤0.15 Ω	≤0.2 Ω	≤0.29 Ω	≤0.44 Ω	≤0.58 Ω	≤0.73 Ω
Insulation resistance	>40 GΩ	>28.57 GΩ	>20 GΩ	>13.33 GΩ	>10 GΩ	>8 GΩ
Max. current load in accordance with IEC 60364-5-523 by installation type						
Wall mounting	20 A					
Installed in conduit or cable duct	17.8 A					
Installed in cable tray	20.9 A					

Environmental conditions

Temperature	
Moving	-10 to 80°C
Static	-40 to 90°C

1.5 mm² motor cables

Technical data

8ECM0005.1111C-0

8ECM0007.1111C-0

8ECM0010.1111C-0

8ECM0015.1111C-0

8ECM0020.1111C-0

8ECM0025.1111C-0

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	12.8 mm ±0.4 mm					
Flex radius						
Single bend	>40 mm					
Moving	≥99 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	1.44 kg	1.98 kg	2.74 kg	4.1 kg	5.28 kg	6.5 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 125 mm.

EnDat 2.2 encoder cables

Technical data



8ECF0005.1221C-0

8ECF0007.1221C-0

8ECF0010.1221C-0

8ECF0015.1221C-0

8ECF0020.1221C-0

8ECF0025.1221C-0

General information

Cable cross section	1x 4x 0.14 mm ² + 4x 0.35 mm ²					
Certification						
CE	Yes			-		

Cable construction

Outer sheathing						
Labeling	B&R 4x0.14 + 4x0.35 FLEX UR AWM STYLE 20963 80°C 30V E63216 ¹⁾					

Connector

Type	12-pin female springtec EnDat connector					
Connection cycles	>50					
Contacts	12					
Additional connectors	8-pin male mini I/O encoder connector Connection cycles: >50 Contacts: 8 Protection in accordance with EN 60529: IP20 when connected					
EN 60529 protection	IP67 when connected					

Electrical characteristics

Test voltage						
Wire/Wire	1 kV		0.5 kV		1 kV	
Wire/Shield	0.5 kV					
Conductor resistance						
Supply lines	≤55 Ω/km					
Signal lines	≤134 Ω/km					
Insulation resistance	>200 MΩ * km		>20 GΩ		>200 MΩ * km	

Environmental conditions

Temperature						
Moving	-10 to 80°C					
Static	-40 to 80°C					

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	6 mm ±0.2 mm		6 mm ±0.25 mm		6 mm ±0.2 mm	
Flex radius						
Single bend	≥18 mm		≥20 mm		≥18 mm	
Moving	≥75 mm					
Drag chain data						
Acceleration	≤60 m/s ²					
Flex cycles	≥3,000,000 ²⁾					
Speed	≤4 m/s					
Weight	0.33 kg	0.42 kg	0.6 kg	0.9 kg	1.4 kg	1.8 kg

¹⁾ The specified values refer to the raw cable being used.

²⁾ Valid at an ambient temperature of 20°C and a flex radius of 75 mm.

Resolver cables

Technical data



8ECR0005.1111C-0

8ECR0007.1111C-0

8ECR0010.1111C-0

8ECR0015.1111C-0

8ECR0020.1111C-0

8ECR0025.1111C-0

General information

Cable cross section	3x 2x 24 19 AWG
Certification	
CE	Yes

Cable construction

Outer sheathing	
Labeling	BERNECKER + RAINER 3x2x24 AWG FLEX UL AWM STYLE 20671 90°C 30 V E63216 CSA AWM 90°C 30 V I/II A/B FT1 LL46064

Connector

Type	12-pin female speedtec resolver connector
Connection cycles	>50
Contacts	12
Additional connectors	Mini I/O encoder connector, 8-pin male Connection cycles: >50 Contacts: 8 Protection in accordance with EN 60529: IP20 when connected IP67 when connected
EN 60529 protection	IP67 when connected

Electrical characteristics

Test voltage						
Wire/Wire	1.5 kV					
Wire/Shield	0.8 kV					
Conductor resistance						
Signal lines	≤0.43 Ω	≤0.6 Ω	≤0.86 Ω	≤1.29 Ω	≤1.72 Ω	≤2.15 Ω
Insulation resistance	>40 GΩ	>28.57 GΩ	>20 GΩ	>13.33 GΩ	>10 GΩ	>8 GΩ

Environmental conditions

Temperature	
Moving	-10 to 80°C
Static	-40 to 90°C

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	6.5 mm ±0.2 mm					
Flex radius						
Single bend	≥20 mm					
Moving	≥50 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	0.39 kg	0.52 kg	0.7 kg	1 kg	1.4 kg	1.7 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 65 mm.

8EXA100.0010-00, 8EXA200.0010-00



General information

Short description

8EXA100.0010-00

ACOPOS P3 cover - B&R orange, single-width, for servo drives

- 8E11X6XXSXX.XXXX-X
- 8E12X2XXSXX.XXXX-X
- 8E14X5XXSXX.XXXX-X
- 8E18X8XXSXX.XXXX-X

8EXA200.0010-00

ACOPOS P3 cover - B&R orange, single-width, for servo drives

- 8E12X2XXDXX.XXXX-X / 8E12X2XXTXX.XXXX-X
- 8E14X5XXDXX.XXXX-X / 8E14X5XXTXX.XXXX-X
- 8E18X8XXDXX.XXXX-X / 8E18X8XXTXX.XXXX-X

Mechanical characteristics

Dimensions

Width

66 mm

Length

240 mm

320 mm

Height

47 mm

Weight

82 g

107 g

Terminal blocks

8TB2104.2210-00, 8TB2104.2210-50, 8TB2204.2210-50, 8TB3102.222C-20, 8TB3202.222C-40



General information	8TB2104.2210-00	8TB2104.2210-50	8TB2204.2210-50	8TB3102.222C-20	8TB3202.222C-40
Short description	Push-in terminals, single row, for servo drives 8EIXXXXXXX.XXXX-1, X8 connection (trigger)	Push-in terminals, single row, for servo drives 8EIXXXXXXX.XXXX-1, X7 connection (enable)	Push-in terminals, double row, for servo drives 8EIXXXXXXX.XXXX-1, X7 connection (enable)	Push-in terminals, single row, for servo drives 8EIXXXXXXX.XXXX-1, X2 connection (24 V)	Push-in terminals, double row, for servo drives 8EIXXXXXXX.XXXX-1, X2 connection (24 V)
Terminal block	8TB2104.2210-00	8TB2104.2210-50	8TB2204.2210-50	8TB3102.222C-20	8TB3202.222C-40
Note	Label 1: 4 3 2 1 0 keying: none Single row	Label 1: 4 3 2 1 0 keying: none Single row Yellow	Label 1: 4 3 2 1 0 keying: none Double row Yellow	Label 3: COM 24 V C keying: 10 Single row Locking: Click and lock system	Label 2: COM 24 V C keying: 10 Double row Locking: Click and lock system
Number of pins	4	4	4	2	2
Type of terminal clamp	Push-in spring connector				
Cable type	Only copper wires (no aluminum wires!)				
Keying	0	0	0	C	C
Distance between contacts	5.08 mm	5.08 mm	5.08 mm	7.62 mm	7.62 mm
Connection cross section					
AWG wire	26 to 12 AWG	26 to 12 AWG	26 to 12 AWG	24 to 8 AWG	24 to 8 AWG
Wire end sleeves with plastic covering	0.25 to 2.5 mm ²	0.25 to 2.5 mm ²	0.25 to 2.5 mm ²	0.25 to 4 mm ²	0.25 to 4 mm ²
Solid wires	0.2 to 2.5 mm ²	0.2 to 2.5 mm ²	0.2 to 2.5 mm ²	0.2 to 10 mm ²	0.2 to 10 mm ²
Fine strand wires	0.2 to 1.5 mm ²	0.2 to 1.5 mm ²	0.2 to 1.5 mm ²	0.2 to 6 mm ²	0.2 to 6 mm ²
With wire end sleeves	0.25 to 2.5 mm ²	0.25 to 2.5 mm ²	0.25 to 2.5 mm ²	0.25 to 6 mm ²	0.25 to 6 mm ²
Electrical characteristics	8TB2104.2210-00	8TB2104.2210-50	8TB2204.2210-50	8TB3102.222C-20	8TB3202.222C-40
Nominal voltage	320 V (IEC) / 300 V (UL)	320 V (IEC) / 300 V (UL)	320 V (IEC) / 300 V (UL)	1000 V (IEC) / 600 V (UL)	1000 V (IEC) / 600 V (UL)
Nominal current	12 A (IEC) / 10 A (UL)	12 A (IEC) / 10 A (UL)	12 A (IEC) / 10 A (UL)	41 A (IEC) / 35 A (UL)	41 A (IEC) / 31 A (UL)
Mechanical characteristics	8TB2104.2210-00	8TB2104.2210-50	8TB2204.2210-50	8TB3102.222C-20	8TB3202.222C-40
Dimensions					
Width	26 mm	26 mm	25.5 mm	15.2 mm	15.2 mm
Height	15 mm	15 mm	22.1 mm	19.8 mm	35 mm
Depth	25.6 mm	25.6 mm	25.7 mm	38.5 mm	41.5 mm
Weight	7 g	7 g	9 g	10 g	20 g

8TB3308.222A-00, 8TB3103.222A-20, 8TB3106.222B-20, 8TB3106.223C-20, 8TB3206.222B-40, 8TB3206.223C-40



General information	8TB3308.222A-00	8TB3103.222A-20	8TB3106.222B-20	8TB3106.223C-20	8TB3206.222B-40	8TB3206.223C-40
Short description	Push-in terminals, for servo drives 8EIXXXXXXXXXX.XXXX-1, X5 connection (motor)	Push-in terminals, single row, for servo drives 8EIXXXXXXXXXX.XXXX-1, X6 connection (braking resistor)	Push-in terminals, single row, for servo drives 8EIXXXHXXXX.XXXX-1, X1 connection (mains)	Push-in terminals, single row, for servo drives 8EIXXXMXXXX.XXXX-1, X1 connection (mains)	Push-in terminals, double row, for servo drives 8EIXXXHXXXX.XXXX-1, X1 connection (mains)	Push-in terminals, double row, for servo drives 8EIXXXMXXXX.XXXX-1, X1 connection (mains)
Terminal block	8TB3308.222A-00	8TB3103.222A-20	8TB3106.222B-20	8TB3106.223C-20	8TB3206.222B-40	8TB3206.223C-40
Note	Label 2: U V W PE B+ B- T+ T- A keying: 0000	Label 3: PE RB- RB+ Coding A: 000 Single row Locking: Click and lock system	Label 2: PE L3 L2 L1 DC- DC+ B keying: 000001 Single row Locking: Click and lock system	Label 3: PE L3 L2(N) L1 DC- DC+ C keying: 000010 Single row Locking: Click and lock system	Label 3: PE L3 L2 L1 DC- DC+ B keying: 000001 Double row Locking: Click and lock system	Label 3: PE L3 L2(N) L1 DC- DC+ C keying: 000010 Double row Locking: Click and lock system
Number of pins	8 (4 + 4)	3	6	6	6	6
Type of terminal clamp	Push-in spring connector					
Cable type	Only copper wires (no aluminum wires!)					
Keying	A	A	B	C	B	C
Distance between contacts	7.62 mm					
Connection cross section	24 to 8 AWG					
AWG wire						
Wire end sleeves with plastic covering	1.5 to 6 mm ²	0.25 to 4 mm ²	0.25 to 4 mm ²	0.25 to 4 mm ²	0.25 to 4 mm ²	0.25 to 4 mm ²
Solid wires	0.5 to 10 mm ²	0.2 to 10 mm ²	0.2 to 10 mm ²	0.2 to 10 mm ²	0.2 to 10 mm ²	0.2 to 10 mm ²
Fine strand wires	0.5 to 10 mm ²	0.2 to 6 mm ²	0.2 to 6 mm ²	0.2 to 6 mm ²	0.2 to 6 mm ²	0.2 to 6 mm ²
With wire end sleeves	1.5 to 6 mm ²	0.25 to 6 mm ²	0.25 to 6 mm ²	0.25 to 6 mm ²	0.25 to 6 mm ²	0.25 to 6 mm ²
Electrical characteristics	8TB3308.222A-00	8TB3103.222A-20	8TB3106.222B-20	8TB3106.223C-20	8TB3206.222B-40	8TB3206.223C-40
Nominal voltage	1000 V (IEC) / 600 V (UL)					
Nominal current	34 A (IEC) / 35 A (UL)	41 A (IEC) / 35 A (UL)	41 A (IEC) / 35 A (UL)	41 A (IEC) / 35 A (UL)	41 A (IEC) / 31 A (UL)	41 A (IEC) / 31 A (UL)
Mechanical characteristics	8TB3308.222A-00	8TB3103.222A-20	8TB3106.222B-20	8TB3106.223C-20	8TB3206.222B-40	8TB3206.223C-40
Dimensions						
Width	39 mm	22.9 mm	53.7 mm	53.7 mm	53.7 mm	53.7 mm
Height	23.1 mm	19.8 mm	19.8 mm	19.8 mm	35 mm	35 mm
Depth	44.7 mm	38.5 mm	38.5 mm	38.5 mm	41.5 mm	41.5 mm
Weight	24 g	-	31 g	31 g	55 g	55 g

Coding keys

8EXC000.0020-00



General information

Short description

Keying plugs - red (20x 6 pcs.), for ACOPOS P3 terminals 8TB3308 (motor connection)

Mechanical characteristics

Weight

1 g

ACOPOS P3 – Technology functions

ACOPOS technology functions

Model number	Short description
1TG8ACP0000.00-01	<p>ACOPOS technology functions</p> <p>License for one ACOPOS technology package per axis. ACOPOS technology packages are not mutually dependent and can be licensed individually.</p> <p>The following ACOPOS technology packages can be licensed:</p> <ul style="list-style-type: none">■ Virtual axis■ Determining the position using PWM signals until stationary (encoderless control – ELC)■ Control of dynamic systems (DynSys)■ Backlash compensation and spindle pitch error correction■ Repetitive control • ISQ ripple + Identification - motor parameters, encoder parameters■ Application programming – ACOPOS reACTION
1TG8ACP0000.00-99	<p>ACOPOS technology function - flat rate</p> <p>General license for all ACOPOS technology packages per axis.</p> <p>The following ACOPOS technology packages can be licensed:</p> <ul style="list-style-type: none">■ Virtual axis■ Determining the position using PWM signals until stationary (encoderless control – ELC)■ Control of dynamic systems (DynSys)■ Backlash compensation and spindle pitch error correction■ Repetitive control • ISQ ripple + Identification - motor parameters, encoder parameters■ Application programming – ACOPOS reACTION

SafeMOTION technology functions

Model number	Short description
1TG8ACPSMC0.00-01	<p>SafeMOTION technology functions</p> <p>License for one SafeMOTION technology package per axis. SafeMOTION technology packages are not mutually dependent and can be licensed individually.</p> <p>The following SafeMOTION technology packages can be licensed:</p> <ul style="list-style-type: none">■ STO, SS1, SBC (without encoder support)■ SS2, SOS, SLS, SDI, SLI, SLA (SafeSPEED incremental, without absolute position)■ Safe Homing, SLP, SMP, Remanent Safe Position (SafePOSITION absolute position)■ SBT, SLT (for supported hardware)






ACOPOS

Intelligent servo drives

Increased production quantities, faster production cycles, improved quality and greater precision are a reality with servo drives from the ACOPOS series.

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System features

High-performance servo drive design

The ACOPOS servo drive family is a core component of B&R's comprehensively integrated automation solutions. Industry-specific functions and intuitive tools provide the foundation for shorter development times.

The performance of an automation solution can be judged by a single factor: how quickly and accurately it can react to application-driven events and sudden changes in the production process. This is exactly the reason why ACOPOS servo drives work with extremely short sampling and communication cycles of 400 μ s, cycles that are reduced even further to 50 μ s in the control loop itself.

Exceptional quality – Robust and safe

Whether heavy vibration or extreme temperatures, ACOPOS servo drives were put through a series of stringent tests during development and subjected to stress far in excess of what they would actually experience under normal operating conditions.



Developers paid special attention to making sure that these systems had the necessary EMC characteristics suitable for harsh industrial environments as well. Testing didn't stop at the limits dictated by the applicable standards, either; extensive field tests in extremely adverse conditions further confirmed the excellent results from the testing laboratories. All necessary filters required by the respective CE guidelines are already integrated in these systems, simplifying wiring at every stage.

Relying in part on advanced computer-aided modeling to determine the thermal characteristics of the complete system, B&R used the current and temperature values gained in this way to make sure that these systems deliver maximum performance based on maximum efficiency.

Because ACOPOS servo drives can read all of the relevant mechanical and electronic data on the motor's embedded parameter chip, the tedious and error-prone task of configuring parameters manually is no longer necessary – a feature that considerably reduces commissioning times. In addition, service technicians can use this information to determine whether errors have been caused by improper handling.

Drives in the ACOPOS servo family are available with partially coated circuit boards as well, making these variants – with identical specifications – even more robust with respect to environmental influences such as dust, aggressive vapors and moisture.

More room for innovation

The successful application of ACOPOS servo drives in the following fields demonstrates the impressive innovative power of their pioneering design: Performance and function coupled with ease of use.

- Packaging industry
- Industrial handling
- Plastics processing
- Paper and printing
- Textile industry
- Wood
- Metalworking
- Semiconductors



Modular, precise and interconnective

The I/O necessary to operate a servo axis comes standard on ACOPOS servo drives, with two high-precision trigger inputs for handling applications that require extremely accurate measurements or registration mark control. The user is provided two trigger inputs for tasks requiring precise measurements or registration mark control.

ACOPOS servo drives can be further adapted to meet any application-specific requirement through the use of plug-in modules. These modules can be used to establish network connections with other drive, controller and HMI systems in addition to connecting encoders, sensors and actuators. CPU modules are also available for the complete integration of controller and drive.

Higher productivity with Smart Process Technology



Smart Process Technology meets customer needs for cost-effective solutions and high production speeds. This freely configurable technology library is uniformly integrated into existing motion control products.

The use of indirect process parameters makes it possible to eliminate sensors, which are often not fast enough to keep up with high production speeds. Synchronous processing and short response times make it possible to achieve excellent productivity and precision. In addition, powerful and intelligent decentralized units allow seamless quality control. In the field, this significantly reduces cycle times while improving component quality.

Improved product quality, increased machine productivity, reduced maintenance and downtime and seamless quality control during production – every last one of these requirements of advanced motion control products is satisfied completely.

ACOPOS – Perfect for CNC applications as well



B&R's integrated soft CNC system combines all of the software components necessary for machine automation on a powerful 64-bit platform, providing sufficient computing power to handle even the most complex CNC machine tools. When used together with ACOPOS servo drives, its integrated architecture opens up all kinds of opportunities with respect to response speed, data throughput and precision – all while reducing overall costs at the same time.

- Uniformly integrated ACOPOS servo drive technology
- High-performance with fast response times
- Ultimate freedom for automation concepts with unlimited PLC and CNC system flexibility
- 8 independent CNC channels
- Up to a total of 100 axes for positioning, CNC and electronic gears
- Customizable graphical interface
- Nearly unlimited system memory for programs, diagnostics and process data
- Internet or intranet connection for inspection and remote maintenance

Leading manufacturers of water jet, laser and flame cutting machines are already utilizing these technological advantages.

System features

PLCopen motion control function blocks

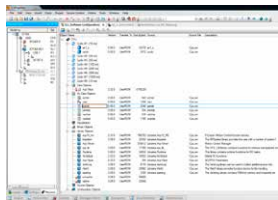
Motion control is one of the central topics in automation technology. This is due in part to the fact that this area bears a relatively high share of the costs of an entire automation solution; as a result, the potential for savings are high as well.

PLCopen motion control function blocks comply with the IEC 61131-3 standard and help users reduce costs by offering vendor-independence and reducing overall development times. Additional support is provided through the use of a wide variety of programming languages, including Ladder Diagram (LD), Structured Text (ST) and the high-level language C.

The functionality provided by these function blocks can be broken down into single- and multi-axis movements. Single-axis movements include traditional absolute and relative movements, as well as the possibility of overlapping movements. Multi-axis movements provide support for gear, cam profile, up/down synchronization and differential gear (i.e. changing the phase angle) functions.

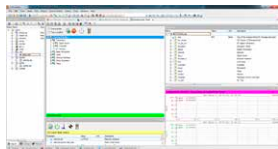


Configuring instead of programming



It's easy to configure parameters for ACOPOS servo drives to handle demanding positioning tasks such as those involving electronic gears or cam profiles. Building on experience gained over decades of cooperation with customers from around the world, B&R shares its expertise in the form of compact function blocks developed for virtually every area, allowing industry-specific functionality to be easily implemented in any application.

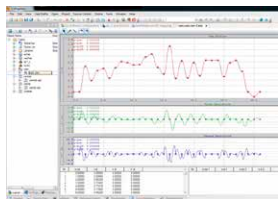
Quick and easy commissioning



All B&R products are programmed and configured in the same way using a Windows-based tool, B&R Automation Studio. This software makes it possible to implement complex drive solutions after just a short orientation period, with hardware components and program sections added and configured in easy-to-use dialog boxes. This considerably reduces project development time.

In addition to being able to verify all axis movements without programming using the NC Test feature, motions ranging from point-to-point movements to those involving gear functions can be carried out interactively. The response of an axis can even be monitored while the system is online, while Trace functionality records relevant drive data for clear analysis at any time.

Tools for straightforward and efficient diagnostics



In addition to an oscilloscope function for monitoring the drive in real time, it is also possible to analyze a movement during operation through the use of versatile triggers that generate all kinds of useful data. A visual display allows the user to make fine adjustments and optimize movements down to the microsecond. The integration of powerful tools such as the cam editor reduces programming for complex coupled movements to simple drag-and-drop procedures, with the ability to analyze the results and effects on speed, acceleration and jolt immediately in the form of detailed graphs.

ACOPOS servo drives

Controlling your motion control systems with ACOPOS servo drives from B&R allows you to take advantage of every opportunity to optimize your entire system architecture. Applications that combine traditional positioning tasks with those that are more challenging – involving torque limitation or torque control, for example – can be created quickly and elegantly. The versatility made possible by the B&R servo drive approach relies on perfectly coordinated hardware and software components that can be matched to handle any application demand large or small to give you and your systems the competitive edge.

- Perfect integration in every B&R product family
- Minimized development time and maximized reusability with object-oriented axis programming
- Integrated technology functions for handling industry-specific requirements
- Operation of synchronous and/or induction motors possible
- Current controller sampling time up to 50 µs
- Reduced commissioning and service times with embedded motor parameter chips
- CAN bus and POWERLINK network connections
- Input voltage range from 400 - 480 VAC (±10%) for a wide area of use
- Able to connect all standard encoder systems
- Up to two available slots for optional technology modules
- Integrated electronic secure restart inhibit
- Optional partially coated circuit boards – more robust with respect to environmental influences

24 VDC supply during power failures

In order to satisfy IEC 60204-1 Category 1 requirements with respect to stopping during a power failure, the 24 VDC voltage supply for the servo drive, encoder, sensors and safety circuit must remain active until the entire system comes to a stop. ACOPOS servo drives can recognize a power failure and immediately initiate active braking of the motor.

The energy generated when braking is returned to the DC bus, where it can be used by the DC bus power supply to generate the 24 VDC voltage supply. Whereas an external DC bus power supply must be used for the 8V1010 to 8V1090 ACOPOS servo drives, a DC bus power supply is integrated internally in ACOPOS servo drives 8V1180 to 8V128M. ACOPOS servo drives with an integrated DC bus power supply not only provide the 24 VDC supply for the servo drive, but also supply a 24 VDC output for encoders, sensors and the safety circuit as well. In many cases, it is not even necessary to use an uninterruptible power supply (UPS).

Overview

The ACOPOS servo drive series covers a current range from 1.0 to 128 A and a power range from 0.5 to 64 kW with 11 more or less similar devices broken down into 4 groups. In addition to possible connections to all conventional encoder systems and modular fieldbus interfaces, ACOPOS servo drives are suitable for both synchronous and induction servo motors and have built-in line filters that meet the limit values set forth in CISPR 11, Group 2, Class A.





	8V1010.xxx-2 8V1016.xxx-2	8V1022.0xx-2 8V1045.0xx-2 8V1090.0xx-2	8V1180.0xx-2 8V1320.0xx-2	8V1640.0xx-2 8V128M.0xx-2
Power connection	Connection possible	Connection possible	Connection possible	Hard
Integrated line filter	Yes	Yes	Yes	Yes
Power failure monitoring	Yes	Yes	Yes	Yes
DC bus connection	Yes	Yes	Yes	Yes
24 VDC supply	External ¹	External ¹	External or internal via DC bus power supply	External or internal via DC bus power supply
24 VDC output	No	No	24 V / 0.5 A	24 V / 0.5 A
Integrated brake chopper	Yes	Yes	Yes	Yes
Internal braking resistor	Yes	Yes	Yes	Yes ²
Connection of external braking resistor possible	No	No	Yes	Yes
Monitored output for motor holding brake	Yes	Yes	Yes	Yes
Monitored input for motor temperature sensor	Yes	Yes	Yes	Yes
Max. number of plug-in modules	3	4	4	4

¹ An external DC bus power supply can be used.





² The braking resistors integrated in 1640 and 128M ACOPOS servo drives are dimensioned so that it is possible to brake to a complete stop (in a typical drive situation).

Product overview





















ACOPOS servo drives

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ACOPOS plug-in modules

	Network modules	618
	Encoder modules	620
	I/O modules	630
	CPU modules	634

Accessories

	Battery module	 640
	0.75 mm ² motor cables	 641
	1.5 mm ² motor cables	 642
	4 mm ² motor cables	 643
	10 mm ² motor cables	 644
	35 mm ² motor cables	 645
	1.5 mm ² hybrid motor cable	 644
	4 mm ² hybrid motor cable	 650
	EnDat 2.1 cables	 646
	Resolver cables	 651

Technical data for all servo drive modules

Power mains connection

Permissible power mains forms	TT, TN ¹⁾
Frequency	50 / 60 Hz $\pm 4\%$
Switch-on interval	>10 s
Integrated line filter in accordance with EN 61800-3, Category C3 ²⁾	Yes

Motor connection

Quantity	1
Possible switching frequencies	5 / 10 / 20 kHz
Electrical stress of the connected motor in accordance with IEC TS 60034-25 ³⁾	Limit value curve A
Protective measures	
Overload protection	Yes
Short circuit and ground fault protection	Yes
Max. output frequency	598 Hz ⁴⁾

Limit switch and reference inputs

Quantity	3
Wiring	Sink
Electrical isolation	
Input - ACOPOS	Yes
Input - Input	No
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Switching threshold	
Low	<5 V
High	>15 V
Input current at nominal voltage	Approx. 4 mA
Switching delay	Max. 2.0 ms
Modulation compared to ground potential	Max. ± 38 V

Enable inputs

Quantity	1
Wiring	Sink
Electrical isolation	
Input - ACOPOS	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Input current at nominal voltage	Approx. 30 mA
Switching threshold	
Low	<5 V
High	>15 V
Switching delay	
Enable 0 -> 1, ready for PWM	Max. 100 μ s
Enable 1 -> 0, PWM off	Max. 2.0 ms
Modulation compared to ground potential	Max. ± 38 V
OSSD signal connections ⁵⁾	Not permitted

Trigger inputs

Quantity	2
Wiring	Sink
Electrical isolation	
Input - ACOPOS	Yes
Input - Input	No
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Switching threshold	
Low	<5 V
High	>15 V
Input current at nominal voltage	Approx. 10 mA
Switching delay	
Rising edge	52 μ s \pm 0.5 μ s (digitally filtered)
Falling edge	53 μ s \pm 0.5 μ s (digitally filtered)
Modulation compared to ground potential	Max. \pm 38 V

Operating conditions

Permitted mounting orientations	
Hanging vertically	Yes
Lying horizontally	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ⁶⁾	2000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	II
EN 60529 protection	IP20

¹⁾ In the USA, TT and TN power mains are commonly referred to as "Delta/Wye with grounded Wye neutral".

²⁾ Limit values from EN 61800-3 C3 (second environment).

³⁾ If necessary, the stress of the motor isolation system can be reduced by an additional externally wired dv/dt choke. For example, the RWK 305 three-phase dv/dt choke from Schaffner (www.schaffner.com) can be used. Important: Even when using a dv/dt choke, it is necessary to ensure that an EMC-compatible, low inductance shield connection is used!

⁴⁾ The module's electrical output frequency (SCTRL_SPEED_ACT * MOTOR_POLEPAIRS) is monitored to protect against dual use in accordance with EC regulation 428/2009 | 3A225. If the electrical output frequency of the module exceeds the limit value of 598 Hz uninterrupted for more than 0.5 s, then the current movement is aborted and error 6060 is output (Power element: Limit speed exceeded).

⁵⁾ OSSD (open signal switching device) signals are used to monitor signal lines for short circuits and cross faults.

⁶⁾ Continuous operation of ACOPOS servo drives at elevations ranging from 500 m to 2000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

Servo drives 1 ... 3.6 A

Technical data



8V1010.00-2

8V1010.001-2

8V1016.00-2

8V1016.001-2

8V1010.50-2

8V1010.501-2

8V1016.50-2

8V1016.501-2

General information

Note	-	Variant with partially coated circuit boards	-	Variant with partially coated circuit boards	-	Variant with partially coated circuit boards	-	Variant with partially coated circuit boards
Certification								
CE					Yes			
cULus					Yes			
KC					Yes			
FSC					Yes			

Power mains connection

Mains input voltage	3x 400 VAC to 480 VAC ±10%			3x 110 VAC to 230 VAC ±10% or 1x 110 VAC to 230 VAC ±10%			
Installed load	Max. 1.35 kVA		Max. 2.1 kVA		Max. 1.35 kVA		Max. 2.1 kVA
Starting current	2 A (at 400 VAC)			5 A (at 230 VAC)			
Power loss at max. device power without braking resistor	80 W		110 W		80 W		110 W

DC bus connection

DC bus capacitance	165 µF			2040 µF		
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24 VDC supply

Input voltage ¹⁾	24 VDC +25% / -20%					
Input capacitance	5600 µF					
Current consumption ²⁾	Max. 1.47 A + current for motor holding brake					

Motor connection

Continuous current ³⁾	1 A _{eff}		1.6 A _{eff}		2.3 A _{eff}		3.6 A _{eff}	
Reduction of continuous current depending on the ambient temperature								
Mains input voltage: 110 VAC								
Switching frequency 5 kHz	-				No reduction			
Switching frequency 10 kHz	-				No reduction		No reduction ⁴⁾	
Switching frequency 20 kHz	-				No reduction			
Mains input voltage: 230 VAC								
Switching frequency 5 kHz	-				No reduction			
Switching frequency 10 kHz	-				No reduction		No reduction ⁴⁾	
Switching frequency 20 kHz	-				No reduction			
Mains input voltage: 400 VAC								
Switching frequency 5 kHz	No reduction				-			
Switching frequency 10 kHz	No reduction ⁴⁾				-			
Switching frequency 20 kHz	No reduction				-			
Mains input voltage: 480 VAC								
Switching frequency 5 kHz	No reduction				-			
Switching frequency 10 kHz	No reduction ⁴⁾				-			
Switching frequency 20 kHz	0.13 A _{eff} per °C (starting at 45°C)		0.13 A _{eff} per °C (starting at 40°C)		-			

Technical data

8V1010.00-2

8V1010.001-2

8V1016.00-2

8V1016.001-2

8V1010.50-2

8V1010.501-2

8V1016.50-2

8V1016.501-2

Reduction of continuous current depending on the installation elevation

Starting at 500 m above sea level	0.1 A _{eff} per 1000 m	0.16 A _{eff} per 1000 m	0.23 A _{eff} per 1000 m	0.36 A _{eff} per 1000 m
Peak current	2.8 A _{eff}	5 A _{eff}	7.8 A _{eff}	12 A _{eff}
Nominal switching frequency	10 kHz			
Max. motor line length	15 m			

Motor holding brake connection

Response threshold for open line monitoring	Approx. 245 mA
Max. output current	1.3 A
Max. number of switching cycles	Unlimited since handled electronically

Braking resistors

Peak power output	2 kW	1.9 kW
Continuous power	130 W	

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum ⁵⁾	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	
	5 to 85%
Storage	
	5 to 95%
Transport	
	Max. 95% at 40°C

Mechanical characteristics

Dimensions	
Width	58.5 mm
Height	257 mm
Depth	220 mm
Weight	2.5 kg

¹⁾ The permissible input voltage range is reduced when using motor holding brakes. The input voltage range should be selected so that the proper supply voltage for the motor holding brake can be maintained.

²⁾ The current consumption depends on the configuration of the ACOPOS servo drive.

³⁾ Valid in the following conditions: 400 VAC mains input voltage, nominal switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level.

⁴⁾ Value for the nominal switching frequency.

⁵⁾ Continuous operation of ACOPOS servo drives at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

For technical data relevant to all modules, see  608.

Servo drives 2.2 ... 8.8 A

Technical data



8V1022.00-2

8V1022.001-2

8V1045.00-2

8V1045.001-2

8V1090.00-2

8V1090.001-2

General information

Note	-	Variant with partially coated circuit boards	-	Variant with partially coated circuit boards	-	Variant with partially coated circuit boards
Certification						
CE	Yes					
cULus	Yes					
KC	Yes					
FSC	Yes					

Power mains connection

Mains input voltage	3x 400 VAC to 480 VAC ±10%					
Installed load	Max. 3 kVA		Max. 5 kVA		Max. 10 kVA	
Starting current at 400 VAC	4 A		7 A			
Power loss at max. device power without braking resistor	Approx. 120 W		Approx. 180 W		Approx. 200 W	

DC bus connection

DC bus capacitance	235 µF		470 µF	
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24 VDC supply

Input voltage ¹⁾	24 VDC ±25%					
Input capacitance	8200 µF					
Current consumption ²⁾	Max. 2.5 A + current for motor holding brake					

Motor connection

Continuous current ³⁾	2.2 A _{eff}		4.4 A _{eff}		8.8 A _{eff}		8.8 A _{eff}	
Reduction of continuous current depending on the ambient temperature								
Mains input voltage: 400 VAC								
Switching frequency 5 kHz	No reduction							
Switching frequency 10 kHz	No reduction				0.18 A _{eff} per °C (starting at 54°C) ⁴⁾			
Switching frequency 20 kHz	No reduction ⁴⁾		0.13 A _{eff} per °C (starting at 45°C) ⁴⁾		0.18 A _{eff} per °C (starting at 30°C)			
Mains input voltage: 480 VAC								
Switching frequency 5 kHz	No reduction							
Switching frequency 10 kHz	No reduction				0.18 A _{eff} per °C (starting at 48°C) ⁴⁾			
Switching frequency 20 kHz	0.13 A _{eff} per °C (starting at 51°C) ⁴⁾		0.13 A _{eff} per °C (starting at 35°C) ⁴⁾		0.18 A _{eff} per °C (starting at 18°C)			
Reduction of continuous current depending on the installation elevation								
Starting at 500 m above sea level	0.22 A _{eff} per 1000 m		0.44 A _{eff} per 1000 m		0.88 A _{eff} per 1000 m			
Peak current	14 A _{eff}		24 A _{eff}					
Nominal switching frequency	20 kHz		25 m		10 kHz			
Max. motor line length	25 m							

Motor holding brake connection

Response threshold for open line monitoring	Approx. 385 mA					
Max. output current	1 A					
Max. number of switching cycles	Unlimited since handled electronically					

Technical data

8V1022.00-2

8V1022.001-2

8V1045.00-2

8V1045.001-2

8V1090.00-2

8V1090.001-2

Braking resistors

Peak power output	3.5 kW	7 kW
Continuous power	130 W	200 W

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum ⁵⁾	55°C
Storage	
Transport	-25 to 55°C
Relative humidity	
Operation	
Storage	5 to 85%
Transport	5 to 95%
	Max. 95% at 40°C

Mechanical characteristics

Dimensions		
Width		
	70.5 mm	
Height		
	375 mm	
Depth		
	235.5 mm	
Weight		
4.0 kg	4.1 kg	4.4 kg

¹⁾ The permissible input voltage range is reduced when using motor holding brakes. The input voltage range should be selected so that the proper supply voltage for the motor holding brake can be maintained.

²⁾ The current consumption depends on the configuration of the ACOPOS servo drive.

³⁾ Valid in the following conditions: 400 VAC mains input voltage, nominal switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level.

⁴⁾ Value for the nominal switching frequency.

⁵⁾ Continuous operation of ACOPOS servo drives at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

For technical data relevant to all modules, see  608.

Servo drives 19 ... 34 A

Technical data



8V1180.00-2

8V1180.001-2

8V1320.00-2

8V1320.001-2

General information

Note	-	Variant with partially coated circuit boards	-	Variant with partially coated circuit boards
Certification				
CE	Yes			
cULus	Yes			
KC	Yes			
FSC	Yes			

Power mains connection

Mains input voltage	3x 400 VAC to 480 VAC $\pm 10\%$			
Installed load	Max. 17 kVA			Max. 30 kVA
Starting current at 400 VAC	13 A			
Power loss at max. device power without braking resistor	Approx. 500 W			Approx. 800 W

DC bus connection

DC bus capacitance	940 μF			1645 μF
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24 VDC supply

Input voltage	24 VDC +25% / -20%			
Input capacitance	40,000 μF			
Current consumption at 24 VDC ¹⁾				
Mains input voltage applied	- ²⁾			
Mains input voltage not applied	Max. 2.8 A + Current for motor holding brake + Current on 24 VDC output			
DC bus power supply				
Switch-on voltage	455 VDC			

24 VDC output

Output voltage				
Mains input voltage applied	22 to 24 VDC			
Mains input voltage not applied	16.7 to 30 VDC ³⁾			
Output current	Max. 0.5 A			

Motor connection

Continuous current ⁴⁾	19 A _{eff}			34 A _{eff}
Reduction of continuous current depending on the ambient temperature				
Mains input voltage: 400 VAC				
Switching frequency 5 kHz	No reduction			
Switching frequency 10 kHz	No reduction ⁵⁾			
Switching frequency 20 kHz	No reduction			0.61 A _{eff} per °C (starting at 40°C)
Mains input voltage: 480 VAC				
Switching frequency 5 kHz	No reduction			
Switching frequency 10 kHz	No reduction ⁵⁾			
Switching frequency 20 kHz	No reduction			0.61 A _{eff} per °C (starting at 25°C)

Technical data

8V1180.00-2

8V1180.001-2

8V1320.00-2

8V1320.001-2

Reduction of continuous current depending on the installation elevation

Starting at 500 m above sea level	1.9 A _{eff} per 1000 m	3.4 A _{eff} per 1000 m
Peak current	50 A _{eff}	80 A _{eff}
Nominal switching frequency	10 kHz	
Max. motor line length	25 m	

Motor holding brake connection

Response threshold for open line monitoring	Approx. 250 mA
Max. output current	1.5 A
Max. number of switching cycles	Unlimited since handled electronically

Braking resistors

Peak power int. / ext.	14 / 40 kW
Continuous power int. / ext.	0.4 / 8 kW ⁶⁾
Minimum braking resistance (ext.)	15 Ω
Rated current of the built-in fuse	12 A (fast-acting)

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum ⁷⁾	55°C
Storage	
Transport	-25 to 70°C
Relative humidity	
Operation	
Storage	5 to 85%
Transport	5 to 95%
	Max. 95% at 40°C

Mechanical characteristics

Dimensions		
Width	200 mm	
Height	375 mm	
Depth	234 mm	
Weight	10.1 kg	10.6 kg

¹⁾ The current consumption depends on the configuration of the ACOPOS servo drive.

²⁾ If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is applied, then the 24 VDC supply voltage for the ACOPOS servo drive is generated by the internal DC bus power supply, reducing the 24 VDC current consumption (I_{24 VDC}) to 0.

³⁾ If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is not applied, the voltage is generated at the 24 VDC output from the ACOPOS servo drive's 24 VDC supply voltage; in this case, it is between the maximum permissible and minimum permissible (reduced by max. 2.5 V) 24 VDC supply voltage of the ACOPOS servo drive.

⁴⁾ Valid in the following conditions: 400 VAC mains input voltage, nominal switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level.

⁵⁾ Value for the nominal switching frequency.

⁶⁾ Continuous power refers to the maximum braking power the ACOPOS servo drive can exchange continuously. Depending on the application, the actual continuous power provided by the external braking resistor is limited by the rated current of fuse I_B (integrated in the ACOPOS servo drive), and the value of the external braking resistance R_{BR}.

⁷⁾ Continuous operation of ACOPOS servo drives at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

For technical data relevant to all modules, see  608.

Servo drives 64 ... 128 A

Technical data



8V1640.00-2

8V1640.001-2

8V128M.00-2

8V128M.001-2

General information

Note	-	Variant with partially coated circuit boards	-	Variant with partially coated circuit boards
Certification				
CE			Yes	
cULus			Yes	
KC			Yes	
FSC			Yes	

Power mains connection

Mains input voltage		3x 400 VAC to 480 VAC ±10%	
Installed load	Max. 54 kVA		Max. 98 kVA
Starting current at 400 VAC		26 A	
Power loss at max. device power without braking resistor	Approx. 1600 W		Approx. 3200 W

DC bus connection

DC bus capacitance	3300 µF		6600 µF
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24 VDC supply

Input voltage		24 VDC +25% / -20%	
Input capacitance		32,800 µF	
Current consumption at 24 VDC ¹⁾			
Mains input voltage applied		- ²⁾	
Mains input voltage not applied	Max. 4.6 A + 1.4 * (Current for motor holding brake + Current on 24 VDC output)		Max. 5.7 A + 1.4 * (Current for motor holding brake + Current on 24 VDC output)

DC bus power supply

Switch-on voltage		455 VDC	
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24 VDC output

Output voltage			
Mains input voltage applied		22 to 24 VDC	
Mains input voltage not applied		16.7 to 30 VDC ³⁾	
Output current		Max. 0.5 A	

Motor connection

Continuous current ⁴⁾	64 A _{eff}		128 A _{eff}
Reduction of continuous current depending on the ambient temperature			
Mains input voltage: 400 VAC			
Switching frequency 5 kHz	No reduction		No reduction ⁵⁾
Switching frequency 10 kHz	No reduction ⁵⁾		1.65 A _{eff} per °C (starting at 52°C)
Switching frequency 20 kHz	0.96 A _{eff} per °C (starting at 25°C)		1.65 A _{eff} per °C (starting at 12°C)
Mains input voltage: 480 VAC			
Switching frequency 5 kHz	No reduction		No reduction ⁵⁾
Switching frequency 10 kHz	0.96 A _{eff} per °C (starting at 50°C) ⁵⁾		1.65 A _{eff} per °C (starting at 36°C)
Switching frequency 20 kHz	0.96 A _{eff} per °C (starting at 10°C)		1.65 A _{eff} per °C (starting at 10°C) ⁶⁾

Technical data

8V1640.00-2

8V1640.001-2

8V128M.00-2

8V128M.001-2

Reduction of continuous current depending on the installation elevation

Starting at 500 m above sea level	6.4 A _{eff} per 1000 m	12.8 A _{eff} per 1000 m
Peak current	200 A _{eff}	300 A _{eff}
Nominal switching frequency	10 kHz	5 kHz
Max. motor line length	25 m	

Motor holding brake connection

Response threshold for open line monitoring	Approx. 210 mA
Max. output current	3 A
Max. number of switching cycles	Approx. 80000

Braking resistors

Peak power int. / ext.	7 / 250 kW	8.5 / 250 kW
Continuous power int. / ext.	0.2 / 24 kW ⁷⁾	0.24 / 24 kW ⁷⁾
Minimum braking resistance (ext.)	2.5 Ω	
Rated current of the built-in fuse	30 A (fast-acting)	

Environmental conditions

Temperature		
Operation		
Nominal	5 to 40°C	
Maximum ⁸⁾	55°C	
Storage		
Transport	-25 to 70°C	
Relative humidity		
Operation		
Storage	5 to 95%	
Transport	Max. 95% at 40°C	

Mechanical characteristics

Dimensions		
Width	276 mm	402 mm
Height	460 mm	
Depth	295 mm	
Weight	24.1 kg	33.8 kg

¹⁾ The current consumption depends on the configuration of the ACOPOS servo drive.

²⁾ If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is applied, then the 24 VDC supply voltage for the ACOPOS servo drive is generated by the internal DC bus power supply, reducing the 24 VDC current consumption (I_{24 VDC}) to 0.

³⁾ If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is not applied, the voltage is generated at the 24 VDC output from the ACOPOS servo drive's 24 VDC supply voltage; in this case, it is between the maximum permissible and minimum permissible (reduced by max. 2.5 V) 24 VDC supply voltage of the ACOPOS servo drive.

⁴⁾ Valid in the following conditions: 400 VAC mains input voltage, nominal switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level.

⁵⁾ Value for the nominal switching frequency.

⁶⁾ For a mains input voltage of 480 VAC and a switching frequency of 20 kHz, a maximum continuous current of 95 A_{eff} is permitted. At ambient temperatures >10°C, a reduction of the continuous current of 1.65 A_{eff} per °C must be taken into consideration.

⁷⁾ Continuous power refers to the maximum braking power the ACOPOS servo drive can exchange continuously. Depending on the application, the actual continuous power provided by the external braking resistor is limited by the rated current of fuse I_B (integrated in the ACOPOS servo drive), and the value of the external braking resistance R_{BR}.

⁸⁾ Continuous operation of ACOPOS servo drives at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

For technical data relevant to all modules, see  608.

Network plug-in modules

8AC110.60-2



- CAN interface for installation in ACOPOS servo drives
- For communication and configuration of ACOPOS servo drives in standard applications
- Node number configurable using switch

General information

Module type	ACOPOS plug-in module
Slot	Slot 1
Power consumption	Max. 0.7 W
Certification	
CE	Yes
cULus	Yes
KC	Yes

Interfaces

CAN	
Quantity	1
Module-side connection	9-pin male DSUB connector
Status indicators	RXD/TXD LEDs
Baud rate	500 kbit/s
Bus terminating resistor	Externally wired
Electrical isolation	Yes

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

8AC114.60-2



- POWERLINK interface for installation in ACOPOS servo drives
- Integrated 2-port hub for easy wiring
- For communication and configuration of ACOPOS servo drives in complex and time-critical applications
- Node number configurable using switch

ETHERNET 
POWERLINK

General information

Module type	ACOPOS plug-in module
Slot	Slot 1
Power consumption	Max. 3 W
Certification	
CE	Yes
cULus	Yes
KC	Yes

Interfaces

POWERLINK	
Quantity	1
Module-side connection	2x RJ45 port
Status indicators	Status LED + 2x Link LED
Transfer rate	100 Mbit/s
Hub, 2x	Yes
Possible station operating modes	Synchronous to POWERLINK cycle
Electrical isolation	Yes
Cabling topology	Star or tree with level 2 hubs
Maximum number of hub levels	10
Cable length	Max. 100 m between two stations (segment length) ¹⁾
Network-capable	Yes
Watchdog functionality	
Hardware	Yes (via ACOPOS servo drive)
Software	Yes (via ACOPOS servo drive)

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	
Transport	-25 to 70°C
Relative humidity	
Operation	
Storage	5 to 85%
Transport	5 to 95%
Max. 95% at 40°C	

¹⁾ With 10 ACOPOS servo drives and a cycle time of 400 µs, the maximum total cable length becomes 200 m.

Encoder plug-in modules

8AC120.60-1



- EnDat 2.1 encoder interface for installation in ACOPOS servo drives
- Encoder monitoring
- Also suitable for evaluating simple incremental encoders with sinusoidal input signal

General information

Module type	ACOPOS plug-in module
Slot ¹⁾	Slots 2, 3 and 4
Power consumption	
Depends on the encoder connected	Yes
E0 ... EnDat single-turn, 512 lines	Max. 2.3 W
E1 ... EnDat multi-turn, 512 lines	Max. 3.1 W
E2 ... EnDat single-turn, 32 lines (inductive)	Max. 3.1 W
E3 ... EnDat multi-turn, 32 lines (inductive)	Max. 3.1 W
E4 ... EnDat single-turn, 512 lines	Max. 2.4 W
E5 ... EnDat multi-turn, 512 lines	Max. 2.7 W
E8 ... EnDat single-turn, 16 lines (inductive)	Max. 2.9 W
E9 ... EnDat multi-turn, 16 lines (inductive)	Max. 3.1 W
EA ... EnDat single-turn, 32 lines (inductive)	Max. 2.7 W
EB ... EnDat multi-turn, 32 lines (inductive)	Max. 3.0 W

Certification

CE	Yes
cULus	Yes
KC	Yes

Encoder inputs

Quantity	1
Module-side connection	15-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOS	No
Encoder monitoring	Yes
Max. encoder cable length	50 m ²⁾
Encoder supply	
Output voltage	Typ. 5 V
Load capability	250 mA ³⁾
Sense lines	2, compensation of max. 2x 0.7 V
Sine/Cosine inputs	
Signal transmission	Differential signals, symmetrical
Signal frequency (-3 dB)	DC up to 300 kHz
Signal frequency (-5 dB)	DC up to 400 kHz
Differential voltage	0.5 to 1.25 V _{ss}
Common-mode voltage	Max. ±7 V
Terminating resistor	120 Ω
Resolution ⁴⁾	16384 * number of encoder lines
Precision ⁵⁾	-
Reference input	
Signal transmission	Differential signal, symmetrical
Differential voltage for low	≤ -0.2 V
Differential voltage for high	≥ +0.2 V
Common-mode voltage	Max. ±7 V
Terminating resistor	120 Ω
Serial interface	
Signal transmission	Synchronous
Protocol	RS485
Baud rate	625 kbaud

8AC120.60-1

Environmental conditions

Temperature

Operation

Nominal 5 to 40°C

Maximum 55°C

Storage -25 to 55°C

Transport -25 to 70°C

Relative humidity

Operation 5 to 85%

Storage 5 to 95%

Transport Max. 95% at 40°C

¹⁾ The AC120 is a single encoder module. It is also possible to insert multiple encoder modules. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

²⁾ Requirements: The encoder is cabled using a shielded cable that has a wire cross section of at least 0.14 mm² for all signal lines and a wire cross section of at least 0.5 mm² for all encoder supply lines. The sense lines must be used.

³⁾ This value only applies to the encoder. The actual load capacity of the encoder supply is approx. 300 mA. The difference of approx. 50 mA covers the consumption of the terminating resistors, which are always present. For longer encoder cables, it is important to note that the maximum voltage drop permitted on the supply wires (there and back) is 1.45 V. This can reduce the permissible load current.

⁴⁾ Only a part of the resolution of the connected encoder can be used in practice. The usable resolution can be further reduced by signal interference from the connected encoder.

⁵⁾ In practice, the precision is limited by the encoder.

Encoder plug-in modules

8AC121.60-1



- HIPERFACE interface for installation in ACOPOS servo drives
- Encoder monitoring

General information

Module type	ACOPOS plug-in module
Slot ¹⁾	Slots 2, 3 and 4
Power consumption	
With encoder current consumption of 0 mA	0.35 W
With encoder current consumption of 100 mA	1.4 W
With encoder current consumption of 170 mA	2.1 W

Certification	
CE	Yes
cULus	Yes
KC	Yes

Encoder inputs

Quantity	1
Module-side connection	15-pin female DSUB connector, 2 pins closed
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOS	No
Encoder monitoring	Yes
Max. encoder cable length	50 m ²⁾
Encoder supply	
Output voltage	8 to 9 V
Load capability	170 mA
Sense lines	- ³⁾

Sine/Cosine inputs	
Signal transmission	Differential signal, asymmetrical
Signal frequency	DC up to 200 kHz
Differential voltage	0.5 to 1.25 V _{SS}
Common-mode voltage	Max. ±7 V
Terminating resistor	120 Ω
Resolution ⁴⁾	16384 * number of encoder lines
Precision ⁵⁾	-

Serial interface	
Signal transmission	Asynchronous
Protocol	RS485
Baud rate	9600 baud

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	
	-25 to 55°C
Transport	
	-25 to 70°C
Relative humidity	
Operation	
	5 to 85%
Storage	
	5 to 95%
Transport	
	Max. 95% at 40°C

¹⁾ The AC121 is a single encoder module. It is also possible to insert multiple encoder modules. In this case, the module in the slot with the lowest number is automatically used for motor feedback.

²⁾ Requirements: The encoder is cabled using a shielded cable that has a wire cross section of at least 0.14 mm² for all signal lines and a wire cross section of at least 0.5 mm² for all encoder supply lines. The sense lines must be used.

³⁾ No sense lines are present since the supply voltage for the HIPERFACE encoder is permitted to be between 7 and 12 V.

⁴⁾ Noise on the encoder signal reduces the resolution that can be used by approx. 5 bits (factor of 32).

⁵⁾ In practice, the precision is limited by the encoder.

8AC122.60-3



- Resolver interface for installation in ACOPOS servo drives
- Monitors encoder input signals
- Resolver type BRX

General information

Module type	ACOPOS plug-in module
Slot ¹⁾	Slots 2, 3 and 4
Power consumption	Max. 2.5 W
Max. cable length	100 m
Certification	
CE	Yes
cULus	Yes
KC	Yes

Resolver inputs

Reference output	
Differential voltage	Typ. 3.4 V _{eff}
Frequency	10 kHz
Signal transmission	Differential signals
Angular position resolution	14 bits/rev ²⁾
Module-side connection	9-pin female DSUB connector
Status indicators	UP/DN LEDs
Bandwidth	2.5 kHz
Encoder monitoring	Yes
Precision	±8 angular minutes
Electrical isolation	
Resolver - ACOPOS	No
Resolver	
Input frequency	10 kHz
Input voltage	3 to 7 V _{rms}
Number of pins	2-pin
Type	BRX ³⁾
Max. phase shift	±45°
Max. elec. angular error	±10 angular minutes
Nominal conversion ratio ⁴⁾	0.5 ±10%
Sine/Cosine inputs	
Input impedance at 10 kHz (per pin)	10.4 kΩ - j 11.1 kΩ
Signal transmission	Differential signals
Encoder-ACOPOS electrical isolation	No, common-mode voltage on the sine-cosine inputs max ± 20 V

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ The AC122 is a single encoder module. It is also possible to insert multiple encoder modules. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

²⁾ A resolution of 12 bits/rev is configured by default, but it can be changed to 14 bits/rev.

³⁾ BRX resolvers are fed with a sine signal (reference signal) from the module and provide two sine signals with a 90° phase shift as a result. The amplitude of these signals changes with the angular position of the resolver. Unlike BRX resolvers, BRT resolvers can be fed with two sine signals which are offset by 90°. A single sine signal with constant amplitude is returned. The phase position of this signal changes with the angular position of the resolver. An evaluation of BRT resolvers with the 8AC122.60-3 is fundamentally possible starting with firmware V2.040; however, resolution and accuracy are limited by the inverse operation of the resolver. Additionally, the nominal conversion ratio deviates from the default value of 0.5 and must be configured accordingly.

⁴⁾ Starting with firmware V2.040, the nominal gear ratio can be configured in the range 0.3 ... 0.5 (default value). Starting with firmware V2.230, the nominal gear ratio can be configured in the range 0.2 ... 0.5 (default value).

Encoder plug-in modules

8AC123.60-1



- Incremental encoder and SSI absolute encoder interface for installation in ACOPOS servo drives
- Monitors encoder input signals
- Encoder supply voltage of 5 V or 15 V
- Compensates for a voltage drop at 5 V encoder voltage supply

General information

Module type	ACOPOS plug-in module
Slot ¹⁾	Slots 2, 3 and 4
Power consumption	Max. 7.5 W Depends on the current consumption of the connected encoder ²⁾

Certification	
CE	Yes
cULus	Yes
KC	Yes

Encoder inputs

Quantity	1
Signal transmission	Differential signal transfer
Module-side connection	15-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOS	Yes
Encoder monitoring	Yes
Max. encoder cable length ³⁾	50 m

Encoder supply

Short circuit protection, overload protection	Yes
Supply voltages	Internal, either 5 V or 15 V
Load capability	
5 VDC	350 mA
15 V	350 mA
Sense lines	
For 5 V	Yes, 2, compensation of max. 2 V
For 15 V	No

Incremental encoder

Counter size	32-bit
Input frequency	Max. 200 kHz
Evaluation	4x
Signal form	Square wave pulse
Counter frequency	Max. 800 kHz
Reference frequency	Max. 200 kHz
Distance between edges	Min. 0.6 μ s
Inputs	A, A \bar , B, B \bar , R, R \bar
Differential voltage inputs A, B, R	
Minimum	2.5 V
Maximum	6 V

SSI absolute encoder

Baud rate	200 kbit/s
Word size	Max. 31-bit
Differential voltage clock output - 120 Ω	
Minimum	2.5 V
Maximum	5 V
Differential voltage data input	
Minimum	2.5 V
Maximum	6 V

8AC123.60-1

Environmental conditions

Temperature

Operation

Nominal 5 to 40°C

Maximum 55°C

Storage -25 to 55°C

Transport -25 to 70°C

Relative humidity

Operation 5 to 85%

Storage 5 to 95%

Transport Max. 95% at 40°C

¹⁾ The AC123 is a single encoder module. It is also possible to insert multiple encoder modules. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

²⁾ The power consumption of the plug-in module can be approximated using the following formula:

$$P_{\text{Module}} [\text{W}] = P_{\text{Encoder}} [\text{W}] \cdot k + 0.6 \text{ W}$$

The power consumed by the encoder P_{Encoder} is calculated from the selected encoder supply voltage (5 V / 15 V) and the current required:

$$P_{\text{Encoder}} [\text{W}] = U_{\text{Encoder}} [\text{V}] \cdot I_{\text{Encoder}} [\text{A}]$$

The following values must be used for k:

k = 1.2 (for 15 V encoder supply)

k = 1.75 (for 5 V encoder supply)

³⁾ The maximum cable length requires at least one 4x 2x 0.14 mm² + 2x 0.5 mm² cable. The sense lines must be used.

Encoder plug-in modules

8AC125.60-1



- BiSS encoder interface (Mode C) for installation in ACOPOS servo drives
- Encoder supply 5 V
- Encoder monitoring

General information

Module type	ACOPOS plug-in module
Slot ¹⁾	Slots 2, 3 and 4
Power consumption	Max. 4.5 W
Certification	
CE	Yes
cULus	Yes
KC	Yes

Encoder inputs ²⁾

Quantity	1
Type	BiSS
Module-side connection	15-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOS	No
Encoder monitoring	Yes
Max. encoder cable length	50 m ³⁾
Encoder supply	
Output voltage	Typ. 5 V
Load capability	250 mA ⁴⁾
Sense lines	No
Reference input	
Signal transmission	Differential signal, symmetrical
Differential voltage for low	≤ -0.2 V
Differential voltage for high	≥ +0.2 V
Common-mode voltage	Max. ±7 V
Terminating resistor	120 Ω
Serial interface	
Signal transmission	Synchronous
Protocol	RS485
Baud rate	1250 kbaud

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ The AC125 is a single encoder module. It is also possible to insert multiple encoder modules. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

²⁾ The BiSS encoder must be wired using a cable with a shield.

³⁾ Requirements: The encoder is cabled using a shielded cable that has a wire cross section of at least 0.14 mm² for all signal lines and a wire cross section of at least 0.5 mm² for all encoder supply lines.

⁴⁾ This value only applies to the encoder. The actual load capacity of the encoder supply is approx. 300 mA. The difference of approx. 50 mA covers the consumption of the terminating resistors, which are always present. For longer encoder cables, it is important to note that the maximum voltage drop permitted on the supply wires (there and back) is 1.45 V. This can reduce the permissible load current.

8AC125.60-2



- BiSS encoder interface (Mode C) for installation in ACOPOS servo drives
- Encoder supply 5 V
- Encoder monitoring

General information

Module type	ACOPOS plug-in module
Slot ¹⁾	Slots 2, 3 and 4
Max. power consumption	2.2 W
Certification	
CE	Yes
cULus	Yes

Encoder connection ²⁾

Module-side connection	9-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOS	No
Encoder monitoring	Yes
Max. encoder cable length	100 m Depends on the cross section of the encoder's supply wires ³⁾

Encoder supply

Output voltage	5 V ... 5.25 V
Load capability	350 mA
Protective measures	
Overload protection	Yes
Short circuit protection	Yes

Synchronous serial interface

Signal transmission	RS485
Baud rate	6.25 Mbit/s

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ The AC126 is a single encoder module. It is also possible to insert multiple encoder modules. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

²⁾ Only 8BCF EnDat 2.2 cables from B&R may be used to connect the module.

³⁾ The maximum encoder cable length l_{max} can be calculated as follows (the maximum permissible encoder cable length of 100 m must not be exceeded):

$$l_{max} = 0.5 \cdot (5.0 - U_{Gmin}) \cdot A / [(I_G + 0.03) \cdot \rho]$$

U_{Gmin} ... Minimum permissible supply voltage of the encoder

I_G ... Max. current consumption of the encoder [A].

A ... Cross section of the supply wire [mm²].

ρ ... Specific resistance [Ω mm²/m] (e.g. for copper: $\rho = 0.0178$).

Encoder plug-in modules

8AC125.61-2



- BiSS encoder interface (Mode C) for installation in ACOPOS servo drives
- 6.25 Mbit/s, 12 V encoder supply
- Encoder monitoring

General information

Module type	ACOPOS plug-in module
Slot ¹⁾	Slots 2, 3 and 4
Max. power consumption	5.8 W
Certification	
CE	Yes
cULus	Yes

Encoder connection ²⁾

Module-side connection	9-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOS	No
Encoder monitoring	Yes
Max. encoder cable length	100 m Depends on the cross section of the encoder's supply wires ³⁾

Encoder supply

Output voltage	Typ. 12 V
Load capability	350 mA
Protective measures	
Overload protection	Yes
Short circuit protection	Yes

Synchronous serial interface

Signal transmission	RS485
Baud rate	6.25 Mbit/s

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ The AC126 is a single encoder module. It is also possible to insert multiple encoder modules. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

²⁾ Only 8BCF EnDat 2.2 cables from B&R may be used to connect the module.

³⁾ The maximum encoder cable length l_{max} can be calculated as follows (the maximum permissible encoder cable length of 100 m must not be exceeded):

$$l_{max} = 2.5 \cdot A / [(I_G + 0.03) \cdot \rho]$$

I_G ... Max. current consumption of the encoder [A].
 A ... Cross section of the supply wire [mm²].
 ρ ... Specific resistance [Ω mm²/m] (e.g. for copper: $\rho = 0.0178$).

8AC126.60-1



- EnDat 2.2 encoder interface for installation in ACOPOS servo drives
- Encoder monitoring
- Embedded parameter chip when used with B&R motors
- Backup battery possible

General information

Module type	ACOPOS plug-in module
Slot ¹⁾	Slots 2, 3 and 4
Max. power consumption	4.4 W
Certification	
CE	Yes
cULus	Yes
KC	Yes

Encoder connection ²⁾

Module-side connection	9-pin female DSUB connector
Status indicators	UP/DN LEDs, BAT LED
Electrical isolation	
Encoder - ACOPOS	No
Encoder monitoring	Yes
Max. encoder cable length	100 m Depends on the cross section of the encoder's supply wires ³⁾

Encoder supply

Output voltage	Typ. 12 V
Load capability	300 mA ⁴⁾
Protective measures	
Overload protection	Yes
Short circuit protection	Yes

Synchronous serial interface

Signal transmission	RS485
Baud rate	6.25 Mbit/s

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ The AC126 is a single encoder module. It is also possible to insert multiple encoder modules. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

²⁾ Only 8BCF EnDat 2.2 cables from B&R may be used to connect the module.

³⁾ The maximum encoder cable length l_{max} can be calculated as follows (the maximum permissible encoder cable length of 100 m must not be exceeded):

$$l_{max} = 2.5 \cdot A / [(I_G + 0.03) \cdot \rho]$$

I_G ... Max. current consumption of the encoder [A].

A ... Cross section of the supply wire [mm²].

ρ ... Specific resistance [Ω mm²/m] (e.g. for copper: $\rho = 0.0178$).

⁴⁾ An additional reserve exists for terminating resistors.

I/O plug-in modules

8AC130.60-1



- Digital mixed module for installation in ACOPOS servo drives
- Maximum of 8 digital inputs or 10 digital outputs
- I/O configurable in pairs as inputs or outputs
- Incremental encoder functionality (A, B, R)
- Incremental encoder emulation

General information

Module type	ACOPOS plug-in module
Slot ¹⁾	Slots 3 and 4
Power consumption	Max. 0.8 W
Certification	
CE	Yes
cULus	Yes
KC	Yes

Inputs/Outputs

Module-side connection	12-pin connector
Status indicators	Status LED (24 V)
Configuration of digital inputs/outputs	Configurable in pairs as inputs or outputs

Incremental encoder

Counter size	16-bit
Input frequency	Max. 62.5 kHz
Evaluation	4x
Signal form	Square wave pulse
Encoder monitoring	No
Counter frequency	Max. 250 kHz
Reference frequency	Max. 62.5 kHz
Distance between edges	Min. 2.5 μ s
Inputs	
Input 1	Channel A
Input 2	Channel B
Input 3	Reference pulse R

Power supply

Voltage monitoring (24 V - LED)	Yes, supply voltage >18 V
Reverse polarity protection	Yes
Power supply	
Minimum	18 VDC
Nominal	24 VDC
Maximum	30 VDC

Digital inputs ²⁾

Quantity	Max. 8
Wiring	Sink
Input voltage	
Nominal	24 VDC
Input current at nominal voltage	
Channel 1-4	Approx. 10 mA
Channel 5-8	Approx. 5.5 mA
Electrical isolation	
Channel - ACOPOS	Yes
Channel - Channel	No
Switching delay	
Channel 1-4	Max. 5 μ s
Channel 5-8	Max. 35 μ s

Event counter

Signal form	Square wave pulse
Input frequency	Max. 100 kHz
Counter size	16-bit
Inputs	
Input 1	Counter 1
Input 2	Counter 2

8AC130.60-1

Digital outputs

Quantity	Max. 10
Readable outputs	Yes
Continuous current	
Outputs 1 - 4	Max. 100 mA
Outputs 5 - 8	Max. 400 mA
Outputs 9 - 10	Max. 2 A
Short circuit current at 24 V (until cutoff)	
Outputs 1 - 4	Approx. 1 A
Outputs 5 - 8	Approx. 1.2 A
Outputs 9 - 10	Approx. 24 A
Electrical isolation	
Output - ACOPOS	Yes
Output - Output	No
Switching frequency (resistive load)	
Outputs 1 - 2	Max. 10 kHz ³⁾
Outputs 3 - 4	Max. 10 kHz ³⁾
Outputs 5 - 8	Max. 5 kHz
Outputs 9 - 10	Max. 100 Hz
Switching voltage	
Minimum	18 VDC
Nominal	24 VDC
Maximum	30 VDC
Switching delay 0 -> 1 and 1 -> 0	
Outputs 1 - 4	Max. 5 µs
Outputs 5 - 8	Max. 50 µs
Outputs 9 - 10	Max. 500 µs
Protection	
Short circuit protection	Yes
Overload protection	Yes
Type	
Outputs 1 - 4	Transistor outputs push-pull
Outputs 5 - 10	High-side transistor outputs

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ The AC130 can also be used as an encoder module. It is also possible to insert multiple encoder modules. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

²⁾ Shielded cables must be used for inputs 1 - 4.

³⁾ Encoder emulation mode: Max. 65 kHz.

I/O plug-in modules

8AC131.60-1



- Mixed module for installation in ACOPOS servo drives
- 2 analog inputs with 12-bit resolution and a maximum of 2 digital inputs/outputs
- Individually switchable inputs/outputs
- Counter function
- All digital outputs can be read

General information

Module type	ACOPOS plug-in module
Slot	Slots 2, 3 and 4
Power consumption	Max. 1 W
Certification	
CE	Yes
cULus	Yes
KC	Yes

Inputs/Outputs

Module-side connection	12-pin connector
Status indicators	24 V LED
Configuration of digital inputs/outputs	Individually configurable as digital inputs or outputs

Power supply

Voltage monitoring (24 V - LED)	Yes, supply voltage >18 V
Reverse polarity protection	Yes
Power supply	
Minimum	18 VDC
Nominal	24 VDC
Maximum	30 VDC

Digital inputs

Quantity	Max. 2
Modulation compared to ground potential	Max. ± 50 V
Wiring	Sink
Input current at nominal voltage	Approx. 8 mA
Input voltage	
Nominal	24 VDC
Electrical isolation	
Channel - ACOPOS	Yes
Channel - Channel	No
Switching delay	
Counter	Max. 5 μ s
Digital input	Max. 55 μ s (digitally filtered)

Event counter

Signal form	Square wave pulse
Input frequency	Max. 100 kHz
Counter size	16-bit
Inputs	
Input 1	Counter 1
Input 2	Counter 2

Analog inputs

Quantity	2
Digital converter resolution	12-bit
Conversion time	<50 μ s
Output format	INT16 \$8000 - \$7FFF LSB = \$0010 = 4.883 mV
Design	Differential input or single ended input
Electrical isolation	
Input - ACOPOS	Yes
Input - Input	No
Input signal	
Nominal	-10 to +10 V
Maximum	-15 to +15 V
Operating modes	Cyclic measurement synchronous to 50 μ s ACOPOS clock

8AC131.60-1

Gain drift	Max. $\pm 0.006\%$ / °C ¹⁾
Offset drift	Max. $\pm 0.0005\%$ / °C ¹⁾
Crosstalk between analog inputs	Min. -90 dB at 1kHz
Differential input impedance	>10 MΩ
Modulation compared to ground potential	Max. ± 50 V
Modulation between analog input channels	Max. ± 5 V
Basic accuracy at 25°C	$\pm 0.05\%$ ¹⁾

Environmental conditions

Temperature

Operation

Nominal 5 to 40°C

Maximum 55°C

Storage -25 to 55°C

Transport -25 to 70°C

Relative humidity

Operation 5 to 85%

Storage 5 to 95%

Transport Max. 95% at 40°C

¹⁾ Based on the measurement range end value.

CPU plug-in modules

8AC140.60-3, 8AC140.61-3



- Complete PLC for installation in ACOPOS servo drives
- Removable CompactFlash application memory (optional accessory)
- Interfaces for connecting to CAN bus, PROFIBUS or Ethernet networks
- Integrated analog input and a maximum of three digital inputs/outputs (individually configurable as inputs/outputs)
- Built-in CNC functionality (ARNC0)

General information	8AC140.60-3	8AC140.61-3
Module type	ACOPOS double-width plug-in module	
Slot ¹⁾	Slots 1 + 2	
Power consumption	Max. 4.5 W	
ACOPOS capability	Yes	
Visual Components support	Yes	
Certification		
CE	Yes	
cULus	Yes	
KC	-	
Controller	8AC140.60-3	8AC140.61-3
Operating system	ACO140 (version V2.67 and higher)	
DRAM	32 MB	
Processor clock	100 MHz	
SRAM	32 kB	
Inputs/Outputs	8AC140.60-3	8AC140.61-3
Module-side connection	8-pin connector	
Configuration of digital inputs/outputs	Individually configurable as inputs or outputs	
Interfaces	8AC140.60-3	8AC140.61-3
IF1 interface		
Type	RS232	
Design	9-pin male DSUB connector	
Status indicators	X1 LED	
Electrical isolation	No	
Max. baud rate	115.2 kbaud	
Max. distance	15 m / 19200 Baud	
IF2 interface		
Type	CAN bus	
Design	9-pin male DSUB connector	
Status indicators	RX / TX LEDs	
Bus terminating resistor	Externally wired	
Electrical isolation	Yes	
Max. distance	1000 m	
IF3 interface		
Type	RS485	
Design	9-pin female DSUB connector	
Status indicators	PB LED	
Bus terminating resistor	External T-connector	
Controller	ASIC SPC3	
Electrical isolation	Yes	
RAM	1.5 kB	
Max. distance	1000 m	
Network-capable	Yes	
Transfer protocol	PROFIBUS DP	
Max. transfer rate		
Bus length ≤100 m	12 Mbit/s	
Bus length ≤200 m	1.5 Mbit/s	
Bus length ≤400 m	500 kbit/s	
Bus length ≤1000 m	187.5 kbit/s	

8AC140.60-3, 8AC140.61-3

IF5 interface		
Type		Ethernet
Design		Male RJ45 connector
Status indicators		ACT LED
Baud rate		10/100 Mbit/s
Electrical isolation		Yes
Max. distance		100 m
Network-capable		Yes
Incremental encoder	8AC140.60-3	8AC140.61-3
Counter size		16-bit
Input frequency		Max. 20 kHz
Evaluation		4x
Signal form		Square wave pulse
Encoder monitoring		No
Counter frequency		Max. 80 kHz
Reference frequency		Max. 20 kHz
Distance between edges		Min. 5 µs
Inputs		
Input 1		Channel A
Input 2		Channel B
Input 3		Reference pulse R
Digital inputs ²⁾	8AC140.60-3	8AC140.61-3
Quantity		Max. 3
Modulation compared to ground potential		Max. ±30 V
Wiring		Sink
Input current at nominal voltage		Approx. 4.2 mA
Input delay		<5 µs
Input voltage		
Nominal		24 VDC
Electrical isolation		
Channel - ACOPOS		Yes
Channel - Channel		No
Event counter	8AC140.60-3	8AC140.61-3
Signal form		Square wave pulse
Input frequency		Max. 100 kHz
Pulse length		Min. 5 µs
Counter size		32-bit
Inputs		
Input 1		Counter 1
Gate measurement	8AC140.60-3	8AC140.61-3
Signal form		Square wave pulse
Counter frequency		
Internal		31.25 kHz or 4 MHz
External		Max. 100 kHz
Gate frequency		Max. 100 kHz
Period measurement	8AC140.60-3	8AC140.61-3
Signal form		Square wave pulse
Input frequency		Max. 100 kHz
Pulse length		Min. 5 µs
Counter frequency		
Internal		31.25 kHz or 4 MHz
External		Max. 100 kHz

CPU plug-in modules

8AC140.60-3, 8AC140.61-3

Analog inputs	8AC140.60-3	8AC140.61-3
Digital converter resolution		12-bit
Conversion time		<50 µs
Output format		INT 16 \$8001 - \$7FFF LSB = \$0010 = 4.88 mV
Design		Differential input
Electrical isolation		
Input - ACOPOS ³⁾		No, max. modulation: ±13 V
Input signal		
Nominal		-10 to +10 V
Maximum		-13 to +13 V
Operating modes		Cyclic measurement non-synchronous to 50 µs ACOPOS clock
Differential input impedance		20 MΩ
Digital outputs	8AC140.60-3	8AC140.61-3
Quantity		Max. 3
Readable outputs		Yes
Continuous short circuit current at 24 V		Typ. 4 A
Continuous current		Max. 500 mA
Switching frequency (resistive load)		Max. 100 Hz
Switching delay		Max. 500 µs (typ. 250 µs)
Type		High-side transistor outputs
Electrical isolation		
Output - ACOPOS		Yes
Output - Output		No
Switching voltage		
Minimum		18 VDC
Nominal		24 VDC
Maximum		30 VDC
Protection		
Short circuit protection		Yes
Overload protection		Yes
Environmental conditions	8AC140.60-3	8AC140.61-3
Temperature		
Operation		
Nominal		5 to 40°C
Maximum		55°C
Storage		-25 to 55°C
Transport		-25 to 70°C
Relative humidity		
Operation		5 to 85%
Storage		5 to 95%
Transport		Max. 95% at 40°C

¹⁾ The AC140 is a double-width module that occupies slots 1 and 2.

²⁾ Shielded cables must be used for inputs 1 - 3.

³⁾ External electrical isolation of the connected sensors is recommended since the analog input is not electrically isolated.

8AC141.60-2, 8AC141.61-3



General information	8AC141.60-2	8AC141.61-3
Module type		ACOPOS double-width plug-in module
Slot ¹⁾		Slots 1 + 2
Power consumption		Max. 4.5 W
ACOPOS capability		Yes
Visual Components support		Yes
Certification		
CE		Yes
cULus		Yes
KC		Yes
Controller	8AC141.60-2	8AC141.61-3
Operating system		AC140 (version V2.80 and higher)
DRAM	16 MB	32 MB
Processor clock		100 MHz
SRAM		32 kB
Inputs/Outputs	8AC141.60-2	8AC141.61-3
Module-side connection		8-pin connector
Configuration of digital inputs/outputs		Individually configurable as inputs or outputs
Interfaces	8AC141.60-2	8AC141.61-3
IF1 interface		
Type		RS232
Design		9-pin male DSUB connector
Status indicators		232 LED
Electrical isolation		No
Max. baud rate		115.2 kbaud
Max. distance		15 m / 19200 Baud
IF2 interface		
Type		CAN bus
Design		9-pin male DSUB connector
Status indicators		CAN1 LED
Bus terminating resistor		Externally wired
Electrical isolation		Yes
Max. distance		1000 m
IF3 interface		
Type		CAN bus
Design		9-pin male DSUB connector
Status indicators		CAN2 LED
Bus terminating resistor		Externally wired
Electrical isolation		Yes
Max. distance		1000 m
Network-capable		Yes
Max. transfer rate		
Bus length ≤60 m		500 kbit/s
Bus length ≤200 m		250 kbit/s
Bus length ≤1000 m		50 kbit/s
IF4 interface		
Type		X2X
Design		4-pin connector
Status indicators		X2X LED
Electrical isolation		Yes
Max. distance		100 m

CPU plug-in modules

8AC141.60-2, 8AC141.61-3

IF6 interface		
Type		Ethernet
Design		Male RJ45 connector
Status indicators		ACT LED
Baud rate		10/100 Mbit/s
Electrical isolation		Yes
Max. distance		100 m
Network-capable		Yes
Incremental encoder	8AC141.60-2	8AC141.61-3
Counter size		16-bit
Input frequency		Max. 20 kHz
Evaluation		4x
Signal form		Square wave pulse
Encoder monitoring		No
Counter frequency		Max. 80 kHz
Reference frequency		Max. 20 kHz
Distance between edges		Min. 5 μ s
Inputs		
Input 1		Channel A
Input 2		Channel B
Input 3		Reference pulse R
Digital inputs ²⁾	8AC141.60-2	8AC141.61-3
Quantity		Max. 3
Modulation compared to ground potential		Max. \pm 30 V
Wiring		Sink
Input current at nominal voltage		Approx. 4.2 mA
Input delay		<5 μ s
Input voltage		
Nominal		24 VDC
Electrical isolation		
Channel - ACOPOS		Yes
Channel - Channel		No
Event counter	8AC141.60-2	8AC141.61-3
Signal form		Square wave pulse
Input frequency		Max. 100 kHz
Pulse length		Min. 5 μ s
Counter size		32-bit
Inputs		
Input 1		Counter 1
Input 2		Count direction (only in stepper motor mode)
Gate measurement	8AC141.60-2	8AC141.61-3
Signal form		Square wave pulse
Counter frequency		
Internal		31.25 kHz or 4 MHz
External		Max. 100 kHz
Gate frequency		Max. 100 kHz
Period measurement	8AC141.60-2	8AC141.61-3
Signal form		Square wave pulse
Input frequency		Max. 100 kHz
Pulse length		Min. 5 μ s
Counter frequency		
Internal		31.25 kHz or 4 MHz
External		Max. 100 kHz

8AC141.60-2, 8AC141.61-3

Analog inputs	8AC141.60-2	8AC141.61-3
Digital converter resolution		12-bit
Conversion time		<50 µs
Output format		INT 16 \$8001 - \$7FFF LSB = \$0010 = 4.88 mV
Design		Differential input
Electrical isolation		
Input - ACOPOS ³⁾		No, max. modulation: ±13 V
Input signal		
Nominal		-10 to +10 V
Maximum		-13 to +13 V
Operating modes		Cyclic measurement non-synchronous to 50 µs ACOPOS clock
Differential input impedance		20 MΩ
Digital outputs	8AC141.60-2	8AC141.61-3
Quantity		Max. 3
Readable outputs		Yes
Continuous short circuit current at 24 V		Typ. 4 A
Continuous current		Max. 500 mA
Switching frequency (resistive load)		Max. 100 Hz
Switching delay		Max. 500 µs (typ. 250 µs)
Type		High-side transistor outputs
Electrical isolation		
Output - ACOPOS		Yes
Output - Output		No
Switching voltage		
Minimum		18 VDC
Nominal		24 VDC
Maximum		30 VDC
Protection		
Short circuit protection		Yes
Overload protection		Yes
Environmental conditions	8AC141.60-2	8AC141.61-3
Temperature		
Operation		
Nominal		5 to 40°C
Maximum		55°C
Storage		-25 to 55°C
Transport		-25 to 70°C
Relative humidity		
Operation		5 to 85%
Storage		5 to 95%
Transport		Max. 95% at 40°C

¹⁾ The AC141 is a double-width module that occupies slots 1 and 2.

²⁾ Shielded cables must be used for inputs 1 - 3.

³⁾ External electrical isolation of the connected sensors is recommended since the analog input is not electrically isolated.

Battery modules

8AXB000.0000-00



General information

Short description	8AC126.60-1 accessory set for encoder buffering consisting of: 1x Lithium battery 3.6 V, 1x battery holder
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Certification

CE	Yes
cULus	Yes

Mechanical characteristics

Weight	11 g
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0.75 mm² motor cables

Technical data



8CM005.12-0

8CM007.12-0

8CM010.12-0

8CM015.12-0

8CM020.12-0

8CM025.12-0

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	0.75 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	White, white/red, white/blue, white/green
Design	Tinned copper stranded wire
Diameter	0.35 mm ²
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR

Connector

Type	8-pin male speedtec motor connector, size 1
EN 60529 protection	IP67 when connected

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	13 A
Installed in conduit or cable duct	11.5 A
Installed in cable tray	13.5 A

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	10.9 mm ±0.4 mm					
Flex radius						
Single bend	>34 mm					
Moving	≥85 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	0.98 kg	1.32 kg	1.82 kg	2.67 kg	3.52 kg	4.37 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 125 mm.

1.5 mm² motor cables

Technical data



8CM005.12-1

8CM007.12-1

8CM010.12-1

8CM015.12-1

8CM020.12-1

8CM025.12-1

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064					
Certification						
CE	Yes					
cULus	Yes					

Cable construction

Power lines						
Quantity	4					
Wire colors	Black, brown, blue, yellow/green					
Design	Tinned copper stranded wire					
Diameter	1.5 mm ²					
Shield	No					
Signal lines						
Quantity	4					
Wire colors	White, white/red, white/blue, white/green					
Design	Tinned copper stranded wire					
Diameter	0.75 mm ²					
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding					
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film					
Outer sheathing						
Material	PUR					

Connector

Type	8-pin female Intercontec motor connector					
EN 60529 protection	IP67 when connected					

Electrical characteristics

Operating voltage	Max. 1000 V					
Max. current load in accordance with IEC 60364-5-523 by installation type						
Wall mounting	20 A					
Installed in conduit or cable duct	17.8 A					
Installed in cable tray	20.9 A					

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	12.8 mm ±0.4 mm					
Flex radius						
Single bend	>40 mm					
Moving	≥99 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles	≥3,000,000					
Speed	≤4 m/s					
Weight	1.43 kg	2 kg	2.75 kg	3.98 kg	5.3 kg	6.6 kg

4 mm² motor cables

Technical data



8CM005.12-3

8CM007.12-3

8CM010.12-3

8CM015.12-3

8CM020.12-3

8CM025.12-3

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064					
Certification						
CE	Yes					
cULus	Yes					

Cable construction

Power lines						
Quantity	4					
Wire colors	Black, brown, blue, yellow/green					
Design	Tinned copper stranded wire					
Diameter	4 mm ²					
Shield	No					
Signal lines						
Quantity	4					
Wire colors	White, white/red, white/blue, white/green					
Design	Tinned copper stranded wire					
Diameter	1 mm ²					
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding					
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film					
Outer sheathing						
Material	PUR					

Connector

Type	8-pin female Intercontec motor connector					
EN 60529 protection	IP67 when connected					

Electrical characteristics

Operating voltage	Max. 1000 V					
Max. current load in accordance with IEC 60364-5-523 by installation type						
Wall mounting	36.4 A					
Installed in conduit or cable duct	31.9 A					
Installed in cable tray	38.2 A					

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	15.8 mm ±0.5 mm					
Flex radius						
Single bend	>50 mm					
Moving	≥122 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles	≥3,000,000					
Speed	≤4 m/s					
Weight	2.21 kg	3 kg	4.31 kg	6.6 kg	9 kg	11.1 kg

10 mm² motor cables

Technical data



8CM005.12-5

8CM007.12-5

8CM010.12-5

8CM015.12-5

8CM020.12-5

8CM025.12-5

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064					
Certification						
CE	Yes					
cULus	Yes					

Cable construction

Power lines						
Quantity	4					
Wire colors	Black, brown, blue, yellow/green					
Design	Tinned copper stranded wire					
Diameter	10 mm ²					
Shield	No					
Signal lines						
Quantity	4					
Wire colors	White, white/red, white/blue, white/green					
Design	Tinned copper stranded wire					
Diameter	1.5 mm ²					
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding					
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film					
Outer sheathing						
Material	PUR					

Connector

Type	8-pin female Intercontec motor connector					
EN 60529 protection	IP67 when connected					

Electrical characteristics


Operating voltage	Max. 1000 V					
Max. current load in accordance with IEC 60364-5-523 by installation type						
Wall mounting	64.6 A					
Installed in conduit or cable duct	54.6 A					
Installed in cable tray	68.3 A					

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	20.1 mm ±0.7 mm					
Flex radius						
Single bend	>62 mm					
Moving	≥156 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles	≥3,000,000					
Speed	≤4 m/s					
Weight	4.29 kg	6 kg	8.3 kg	12.2 kg	16 kg	19.9 kg

35 mm² motor cables

Technical data

	8CM005.12-8	8CM007.12-8	8CM010.12-8	8CM015.12-8	8CM020.12-8	8CM025.12-8
						
General information						
Listed	UL AWM Style 20669, 90°C, 600 V, E63216 and CSA AWM I/II A/B, 90°C, 600 V, FT1 LL46064					
Certification						
CE	-	-	-	-	-	Yes
cULus	-	-	-	-	-	Yes
Cable construction						
Power lines						
Quantity	4					
Wire colors	Black, brown, blue, yellow/green					
Design	Tinned copper stranded wire					
Diameter	35 mm ²					
Shield	No					
Signal lines						
Quantity	4					
Wire colors	White, white/red, white/blue, white/green					
Design	Tinned copper stranded wire					
Diameter	1.5 mm ²					
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding					
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film					
Outer sheathing						
Material	PUR					
Electrical characteristics						
Operating voltage	Max. 600 V					
Max. current load in accordance with IEC 60364-5-523 by installation type						
Wall mounting	133.8 A					
Installed in conduit or cable duct	116.5 A					
Installed in cable tray	143.8 A					
Mechanical characteristics						
Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	32.5 mm ±1 mm					
Flex radius						
Single bend	>101 mm					
Moving	≥252 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles	≥3,000,000					
Speed	≤4 m/s					
Weight	11 kg	15.4 kg	22 kg	33 kg	44 kg	55 kg

1.5 mm² motor hybrid cables

Technical data



8CH005.12-1

8CH007.12-1

8CH010.12-1

8CH015.12-1

8CH020.12-1

8CH025.12-1

General information

Listed	UL AWM Style 21223, 80°C, 1000 V as well as CSA C22.2 No. 210 I/II A/B FT1
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Copper stranded wire
Diameter	1.5 mm ²
Shield	No
Supply lines	
Quantity	2
Wire colors	White/Blue, white/green
Design	Copper stranded wire
Diameter	0.75 mm ²
Shield	Tinned copper braiding, optical coverage >90% and wrapped in foil shield
Signal lines	
Quantity	6
Wire colors	Brown/green, white/green, gray, pink, yellow, violet
Design	Tinned copper stranded wire
Diameter	2x 0.24 mm ² , 4x 0.15 mm ²
Shield	Tinned copper braiding, optical coverage >85% and wrapped in foil shield
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR

Connector

Type	7-pin female speedtec motor connector
Additional connectors	9-pin male DSUB connector Connection cycles: >50 Contacts: 9
EN 60529 protection	Protection in accordance with EN 60529: IP20 when connected IP67 when connected

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	20.2 A
Installed in conduit or cable duct	17.8 A
Installed in cable tray	20.9 A

1.5 mm² motor hybrid cables

Technical data

8CH005.12-1

8CH007.12-1

8CH010.12-1

8CH015.12-1

8CH020.12-1

8CH025.12-1

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	13 mm ±0.4 mm					
Flex radius						
Single bend	>40 mm					
Moving	≥100 mm					
Drag chain data						
Acceleration	4 m/s ²					
Flex cycles	3,000,000					
Speed	4 m/s					
Weight	1.31 kg	1.78 kg	2.48 kg	3.65 kg	4.82 kg	6 kg

4 mm² motor hybrid cables

Technical data



8CH005.12-3

8CH007.12-3

8CH010.12-3

8CH015.12-3

8CH020.12-3

8CH025.12-3

General information

Listed	UL AWM Style 21223, 80°C, 1000 V as well as CSA C22.2 No. 210 I/II A/B FT1
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Copper stranded wire
Diameter	4 mm ²
Shield	No
Supply lines	
Quantity	2
Wire colors	White/Blue, white/green
Design	Copper stranded wire
Diameter	1 mm ²
Shield	Tinned copper braiding, optical coverage >90% and wrapped in foil shield
Signal lines	
Quantity	6
Wire colors	Brown/Green, white/green, gray, pink, yellow, violet
Design	Tinned copper stranded wire
Diameter	2x 0.24 mm ² , 4x 0.15 mm ²
Shield	Tinned copper braiding, optical coverage >85% and wrapped in foil shield
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR

Connector

Type	7-pin female speedtec motor connector
Additional connectors	9-pin male DSUB connector Connection cycles: >50 Contacts: 9
EN 60529 protection	Protection in accordance with EN 60529: IP20 when connected IP67 when connected

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type

Wall mounting	36.4 A
Installed in conduit or cable duct	31.9 A
Installed in cable tray	38.2 A

4 mm² motor hybrid cables

Technical data

8CH005.12-3

8CH007.12-3

8CH010.12-3

8CH015.12-3

8CH020.12-3

8CH025.12-3

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	15.6 mm ±0.4 mm					
Flex radius						
Single bend	>48 mm					
Moving	≥120 mm					
Drag chain data						
Acceleration	4 m/s ²					
Flex cycles	3,000,000					
Speed	4 m/s					
Weight	1.98 kg	2.73 kg	3.86 kg	5.74 kg	7.62 kg	9.5 kg

EnDat 2.1 cables

Technical data



8CE005.12-1

8CE007.12-1

8CE010.12-1

8CE015.12-1

8CE020.12-1

8CE025.12-1

General information

Listed	UL AWM Style 20963, 80°C, 30 V, E63216 and CSA AWM I/II A/B, 90°C, 30 V, FT1 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Supply lines	
Quantity	2
Wire colors	White/Green, white/red
Design	Tinned copper stranded wire
Diameter	0.5 mm ²
Shield	No
Signal lines	
Quantity	10
Wire colors	Blue, brown, yellow, gray, green, pink, red, black, violet, white
Design	Tinned copper stranded wire
Diameter	0.14 mm ²
Shield	No
Complete shielding	Copper braiding, optical coverage >85% and wrapped in foil shield
Outer sheathing	
Material	PUR

Connector

Type	Intercontec 17-pin female EnDat connector
Additional connectors	15-pin male DSUB servo connector Connection cycles: >50 Contacts: 15 Protection in accordance with EN 60529: IP20 when connected
EN 60529 protection	IP67 when connected

Electrical characteristics

Operating voltage	Max. 30 V
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Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	7.3 mm ±0.25 mm					
Flex radius						
Single bend	≥24 mm					
Moving	≥60 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles	≥3,000,000					
Speed	≤4 m/s					
Weight	0.51 kg	0.7 kg	0.95 kg	1.36 kg	1.77 kg	2.2 kg

Resolver cables

Technical data



8CR005.12-1

8CR007.12-1

8CR010.12-1

8CR015.12-1

8CR020.12-1

8CR025.12-1

General information

Listed	UL AWM Style 20671, 90°C, 30 V, E63216 and CSA AWM, 90°C, 30 V, I/II A/B FT1 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Signal lines	
Quantity	6
Wire colors	White, brown, green, yellow, gray, pink
Design	Tinned copper stranded wire
Diameter	AWG 24 / AWG 19
Shield	No
Complete shielding	Copper braiding, optical coverage $\geq 90\%$ and wrapped in isolating film
Outer sheathing	
Material	PUR

Connector

Type	Intercontec 12-pin female resolver connector
Additional connectors	9-pin male DSUB servo connector Connection cycles: >50 Contacts: 9 Protection in accordance with EN 60529: IP20 when connected
EN 60529 protection	IP67 when connected

Electrical characteristics

Operating voltage	Max. 30 V
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Mechanical characteristics




Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	6.5 mm ± 0.2 mm					
Flex radius						
Single bend	≥ 20 mm					
Moving	≥ 50 mm					
Drag chain data						
Acceleration	< 60 m/s ²					
Flex cycles	$\geq 3,000,000$					
Speed	≤ 4 m/s					
Weight	0.4 kg	0.51 kg	0.75 kg	0.98 kg	1.26 kg	1.55 kg

ACOPOSmulti

Modular drive system

B&R's flagship drive system provides a universal solution for automation tasks in machine manufacturing – a milestone on the path to "Perfection in Automation".

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System features

The drive system for maximum customer benefits

In today's market, customers demand more than simply meeting technical requirements. Above all, they need cost-effective solutions, investment protection and a high degree of availability. B&R's ACOPOSmulti drive system delivers on all of these requirements. It provides a universal solution for automation tasks in machine manufacturing – a new milestone on the path to "Perfection in Automation". ACOPOSmulti drives offer the highest degree of efficiency for the multi-axis machines typically found in the plastics, packaging, print and textile industries.



Compact, scalable performance

Getting the most out of the limited space of production halls requires smaller machines, which in turn calls for high-performance drive technology with compact dimensions. This is why the ACOPOSmulti was developed with maximum performance and minimum space requirements in mind. The modules line up seamlessly on the rail. They all have the same height, varying only in width depending on the continuous power rating of the module.

The range of applications is extensive:

- Induction motors with sensorless control
- Permanent magnet torque or linear servo motors
- Ultra-dynamic ironless linear motors
- ...

Outstanding usability

The ACOPOSmulti drive system is designed to provide the highest degree of usability throughout its entire life cycle.

Designed for simple management of machine variants

Ideally suited for industrial control cabinets

Easy maintenance

Return on investment

For ACOPOSmulti's developers, return on investment was a top priority. As a result, it is just as easy to retrofit existing equipment with an ACOPOSmulti drive system as it is to use it in a new machine.

Thanks to software compatibility with the previous ACOPOS drive generation, efforts can be concentrated on the most important component of all – the application. In this case, compatibility does not mean stagnation. It means that B&R equipped the ACOPOSmulti drive generation with all of the functions of its predecessor and then continued to advance both in parallel.

Safety as an integral system component

Revolutionary network-based safety technology – openSAFETY. By integrating this open standard, the ACOPOSmulti drive system, together with other B&R safety-related components, has raised the bar in the area of safe automation solutions.

Integrated technology

Modern marketing demands highly individualized end products, making machine flexibility one of the most decisive factors in gaining a competitive edge. Sophisticated mechatronic solutions continue to replace mechanical process technologies in modern machine concepts.

As they do, the role played by software increases in importance. B&R offers a wide range of industry-specific technology functions that simplify automation even in complex applications. These well-structured and easy-to-operate software modules offer a cost-effective solution every time.

Easy wiring

In efforts to streamline construction of industrial control cabinets, prewired cable trees are used to simplify and accelerate installation and setup on site at the machine or plant. The sophisticated wiring and mounting technology of the ACOPOSmulti drive system means that the entire control cabinet can be wired in advance. Installation is reduced to simply hanging ACOPOSmulti drive components in the control cabinet and connecting them to the prewired cable trees.

Put simply, ACOPOSmulti drastically reduces the amount of manual wiring – perfect for building series-produced machines. The ACOPOSmulti design makes it possible to replace drive components quickly, considerably reducing downtime for production machines.

Managing machine variants

An ACOPOSmulti mounting plate is the basis for different variations of the machine. The design of the machine determines which devices are used. The software automatically recognizes the system configuration and provides all the necessary functionality.

Modular cooling design

The use of fans and climate control units inside the control cabinet means additional maintenance expenses and considerably higher costs. The ideal solution would be a drive design that prevents heat dissipation in the control cabinet altogether. The modular ACOPOSmulti cooling concept offers the designer ultimate freedom to use either conventional heat dissipation inside the control cabinet, a feed-through cooler with IP65 protection for releasing heat outside the control cabinet or a cold plate variant that can be connected to a cooling circuit (water, oil).



Wall mounting

With this conventional mounting method, heat is dissipated directly to the air inside the control cabinet. Although best suited for a small number of axes with low power ratings, this limitation can be circumvented by adding additional fans or other cooling units inside the control cabinet.

Feed-through mounting

Based on a feed-through heat sink, this method transfers dissipated heat directly to the ambient air outside of the control cabinet and is suitable for a large number of axes with any power rating.

Cold plate mounting

A cold plate transfers heat directly to a coolant (oil or water) and is suitable for a large number of axes with any power rating. This method requires the machine to have its own cooling circulation system.

System features

Wiring made easy

The wiring of electrical switching equipment in the control cabinet has been made considerably easier in previous years with plug-in rail mounting systems from various manufacturers. The trend-setting connection technology used by the ACOPOSmulti allows it to use these systems as well.



Simply attaching and fastening the device to the mounting plate establishes the necessary connections to the power supply module, the DC bus, the 24 V auxiliary supply and ground. Additional grounding measures from module to module are not necessary.

The rails integrated in the mounting plate are amply dimensioned, making it possible to order the modules as needed without limitations.



The rail system integrated in the backplane module is designed to be protected from accidental contact. The 24 V auxiliary supply and the voltage from the DC bus are distributed as required.

The rail contacts are used by the power supply and auxiliary supply modules to feed power into the rail system and to supply inverter modules with power. Because a protective ground conductor is integrated in the rail system, it is not necessary to make an additional connection to the modules externally.



The motor and encoder lines are extremely easy to connect using pre-assembled cables with connectors. The same applies to the communication network. For large power ratings (i.e. 64 kW or higher), threaded bolts and sufficient free space make it much easier to connect to the power supply module and inverter module.

ACOPOSmulti motor and encoder cables are assembled with speedtec® connectors from Intercontec, making them extremely easy for customers to use. speedtec® connectors are designed so that the system can only be locked if it is connected correctly. Because of the "ratchet effect", the user is sure that the connector is completely closed and that it cannot be opened again by vibration.



All inserted connections (signal, motor connection) can be wired using screw clamp or cage clamp terminal blocks, depending on the user's requirements. This principle – simply attaching and tightening the screws – was also skillfully applied to the shield connections.

ACOPOSmulti motor cables are equipped with a shield plate that only needs to be connected and fastened to the ACOPOSmulti inverter module, proving that optimal shielding and quick, easy installation do not have to contradict one another.

Trend-setting power supply

Conventional drive systems convert only around half of the applied power from the mains into actual mechanical power. The ACOPOSmulti drive system is different.

Intelligent power supply modules



Stable voltage conditions

DC bus voltage remains constant regardless of the mains supply voltage, which means maximum utilization of the inverter modules and motors no matter the country where they are operated. In addition, ACOPOSmulti drive systems can also be operated without upstream transformers on 3x 220 VAC mains networks.

Power factor correction

Another advantage is that the only power taken from the power mains is active power. PFC (power factor correction) considerably reduces the connected load and current consumption of the machine – up to half in some cases. This results in smaller fuses and wire cross sections. The active power supply modules have also been designed to overcome all of the challenges faced by machine designers that arise from the many different mains networks used around the world, proving once again the sophistication of ACOPOSmulti drives and their utilization of advanced technology.

Integrated power power regeneration

8BVP active power supply modules are able to regenerate power. Instead of being converted to heat, kinetic energy generated during braking is converted to electrical energy that is fed back into the power supply system. The result is an efficient and environmentally friendly solution for preventing heat build-up in the control cabinet. This is especially beneficial when several small axes have to be used in an extremely tight space.

Prepared for "intelligent maintenance"

Like all other intelligent modules in the ACOPOSmulti series, power supply modules also have a POWERLINK network connection and offer completely new options for machine and system diagnostics. This allows all data related to current/power consumption, machine efficiency, etc. to be recorded and analyzed – an enormous step in the direction of "intelligent maintenance".

Integrated 24 V auxiliary supply modules



Supply for the PLC, drives and peripherals

Why was an effort made to include peripheral devices as well as drives in the 24 V supply design of the ACOPOSmulti drive system? The advantage is clear when taking a closer look at the behavior of today's production machines, particularly when power failures or dips occur. While earlier production machines were positively driven with the help of mechanical cams, today's systems are equipped with electronic cams. The well-known advantages of flexibility and wear-free electronics also have a disadvantage; loss of the cam profile link when a power failure occurs.

Power failure not a problem

ACOPOSmulti addresses this issue with its integrated 24 V auxiliary supply module. The kinetic energy generated by the motors during braking is returned to the DC bus where it is available as electrical energy. This electrical energy is distributed to the drives and even to the PLC, PC or peripherals if necessary. To ideally distribute this limited energy during a power failure, the auxiliary supply modules have a fixed output as well as a 24 V output that can be cut off, which is used for supplying non-essential peripheral components. ACOPOSmulti auxiliary supply modules are connected directly to the ACOPOSmulti drive system's common DC bus and are protected against open line, short circuit and overload. This is the ideal solution for retaining the advantage of mechanical cams in electronically coupled systems – making sure that angular references between axes are maintained even when power drops or is lost completely.

System features

Scalable inverter modules



The space inside a control cabinet is extremely valuable, with success or failure on the market often determined by the cabinet's overall size. This is why the ACOPOSmulti drive system was developed with maximum performance and minimum space requirements in mind. To further optimize the compact design, inverter modules up to 22 A are also available as 2-axis modules. Devices above 22 A are available as 1-axis modules with the same compact design.

Scalable dynamic features

The paradigm shift for designers of production machines is in full swing, and the number of hybrid drive systems is increasing accordingly. ACOPOSmulti is the perfect solution for this mix of conventional motor/gearbox combinations and direct drive technology. The scalability of drive computing power allows the best possible utilization of devices in the vast field of motion control technology. That all inverter modules are protected against short circuit and ground faults goes without saying.

Safely taking it to the physical limits



Responsible for the power output of inverter modules, IGBTs (insulated gate bipolar transistors) are one of an inverter's key components. They use pulse width modulated signals to generate an output voltage with a controlled amplitude, frequency and phase. Temperature and temperature increases in the component are two of the most important factors affecting the service life of these IGBTs. Because strict adherence to limits is a measure of quality for an inverter, even under the toughest conditions, B&R guarantees adherence to these limits at maximum output power through the use of a sophisticated mathematical model of the IGBT structure.

Developing a solution to this apparent contradiction provides a number of advantages for the user:

- Safe inverter operation regardless of operating mode and environmental conditions.
- The connected motor does not coast to a stop when the temperature limit is exceeded; instead, the brake is applied until standstill is reached, without overloading the IGBTs.
- Internal computer-aided models (of the IGBTs and motor) make it possible to predict the load on a power transmission system after all of its components have completely warmed up after a single cycle. This function considerably reduces the typically long settling times during thermal processes and provides an extremely efficient way for the machine operator to optimize the entire production process.

Future compatibility ensured with embedded parameter chip

Each module in the ACOPOSmulti drive system has an embedded parameter chip. The clear identification of ACOPOSmulti modules with the embedded parameter chip satisfies the applicable requirements when these systems are used in environments that require validation. Applications that must meet FDA, GAMP or 21CFR11 requirements – for example, having to identify every module replacement – are becoming more and more common.

It's not only ACOPOSmulti modules that use this method of identification. B&R motors are also equipped with an embedded parameter chip that contains all of its relevant mechanical and electronic data, making it possible for the application program to identify the entire power transmission system. The tedious and error-prone task of configuring parameters manually is no longer necessary – a feature that considerably reduces commissioning times. This opens up the possibility for automatic system configuration from the application program, which is of particular interest for complex machine types.

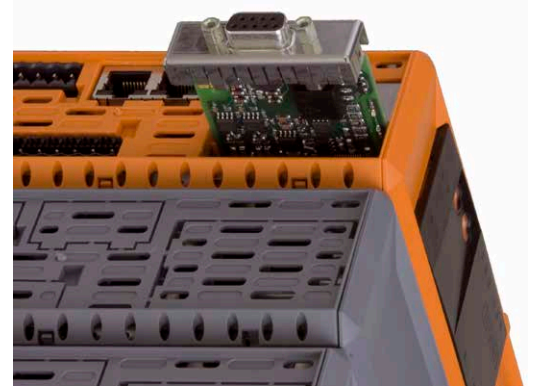


Accurate plug-in encoder modules

Highly accurate encoder interfaces for the ACOPOSmulti drive system play a significant role in delivering excellent results across the entire control network.

ACOPOSmulti plug-in encoder modules are available for many types of encoders:

- EnDat 2.1
- EnDat 2.2
- HIPERFACE
- SSI
- BiSS
- Resolver
- Incremental encoder with square wave output signals
- Incremental encoder with sinusoidal output signals



The nonvolatile application memory integrated in EnDat encoders ("embedded parameter chip") allows the machine manufacturer to store device initialization and calibration parameters such as zero points and torque linearization values. Modules that have been synchronized in this way can then be integrated into the production process or installed at the end customer's facilities without extensive calibration.

EnDat 2.1

EnDat 2.1 is a standard developed by Johannes Heidenhain GmbH (www.heidenhain.de), incorporating the advantages of absolute and incremental position measurement and also offers a read/write parameter memory (embedded parameter chip) in the encoder. The incremental process allows the short deceleration periods necessary for position measurement when using drives with highly dynamic characteristics. With absolute position measurement, a homing procedure for referencing is not required.

EnDat 2.2

This enhancement of the EnDat 2.1 interface provides even more advantages, including the ability to transfer auxiliary information in addition to positioning values over just four signal lines. Optimized signal generation and an extended supply voltage range also contribute to increased system performance. As a serial interface, EnDat 2.2 is also suitable for safety-related applications up to SIL 3.

HIPERFACE

HIPERFACE is a standard developed by Max Stegmann GmbH, which like EnDat incorporates the advantages of absolute and incremental position measurement while also offering a read/write parameter memory in the encoder. With absolute position measurement (the absolute position is sampled serially), a homing procedure for referencing is usually not required. The incremental process allows the short deceleration periods necessary for position measurement when using drives with highly dynamic characteristics.

BiSS

BiSS (bidirectional/serial/synchronous) is based on a protocol used to provide a real-time interface for digital, serial and secure communication between a controller and sensors/actuators. The BiSS protocol can be used in industrial applications that require higher transfer speeds, secure communication, flexibility and easy implementation.

Resolver

The resolver is a measuring principle extremely suited for harsh environmental conditions. Although its transformer functions do not require any electronic components in the motor, its resolution and precision are limited compared to inductive or optical position measurement systems. All of the information contained in the resolver signals is used by the ACOPOSmulti encoder plug-in modules to evaluate the signal, allowing extraordinarily good results.

EnDat 2.2

HIPERFACE[®]
DSL

BiSS
INTERFACE

Quality by B&R

The name B&R stands for many years of experience in developing and manufacturing industrial electronics. The interaction between the mechanics and electronics is a key element in achieving the best possible results and ensuring that modern production systems run at their full capacity. Many years have been invested in the development of the ACOPOSmulti drive system's mechanical design to achieve the highest degree of component density, outstanding performance and simple handling.

High-quality components and excellent EMC properties are the factors that guarantee the high availability of today's production systems. In harsh industrial environments, compliance with EMC standards is a fundamental requirement. This opens up countless possibilities and ensures top quality. Nearly no limits are placed on production system manufacturing.

The ACOPOSmulti drive system was developed by B&R and is produced exclusively by B&R in-house. The shortest possible path between development and production has proven to be the best solution over the years and makes up one of the pillars on which our outstanding quality is based. Customers and users benefit in every aspect because behind the entire range of hardware and software products is a single company – B&R.

Design support

Macros for ECAD systems

Graphic ECAD systems have proven themselves as the right tool for designing a machine's electrical system with optimum use of materials and space.

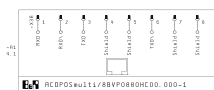
Ready-made electronic descriptions of the mechanical dimensions and electrical signals are available for every module in the ACOPOSmulti drive family. These macros can be loaded directly to proven ECAD systems.

Design and changes are immediately reflected at all levels of development. This saves time for the more important tasks and prevents errors right from the start.

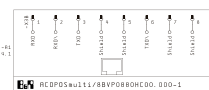
3D CAD documents

The goal is always to get the most out of a control cabinet; however, it is becoming more and more common for electronic components to be placed wherever the machine construction allows. It is extremely important for the control cabinet construction to be adapted to the machine in the best way possible, and 3D CAD data in STEP format is one way this can be achieved for the many different modules in the ACOPOSmulti drive system.

The accelerated development, programming, maintenance and documentation provided by the ACOPOSmulti drive system not only means lower costs and better quality, but also increased sales due to earlier entry on the market.



88VP0880HC00_000-1_4
ACOPOSmulti power supply module 88 A, 800 V, cold plate mounting
4-pole 3



88VP0880HC00_000-1_5
ACOPOSmulti power supply module 88 A, 800 V, cold plate mounting
4-pole 4





Integrated technology

Individualization of end products places increasing demands on machine flexibility. More and more mechanical process technology is being designed with sophisticated mechatronic concepts using software. To keep process precision from falling behind, especially at high production speeds, B&R offers a wide range of industry-specific technology functions.

Taking it to the physical limits

The two trigger or "touch probe" inputs on ACOPOSmulti systems process their signals in the sub-microsecond range, enabling them to meet the most stringent demands on precision. This makes them the perfect inputs for detecting registration marks in packaging, printing or print post-processing applications as well as performing measurement tasks in the metal processing industry.

This quick and precise detection of process parameters such as pressure sensors makes it possible to accurately control extremely sensitive yet highly dynamic processes.

Smart Process Technology

Smart Process Technology – a technology library completely configurable directly in the drive itself – has already doubled production speeds and cut response times down to below a millisecond in countless series-produced machines running ACOPOS servo drives. Now this technology is available for the ACOPOSmulti drive generation as well.

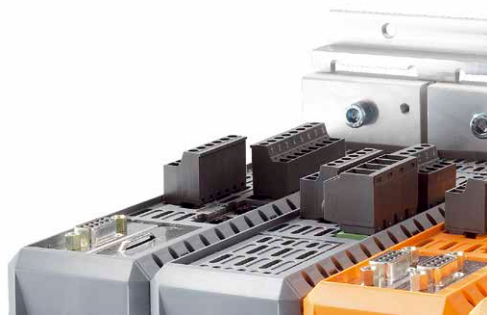
The following are some frequently encountered applications that Smart Process Technology has mastered over the years:

Positioning combined with smart torque control

Many applications are seeing mechanical processes being replaced with delicate yet adaptive electronic processes, which include things like capping drinking bottles or welding extremely small parts. These processes have one thing in common: Optimal control and coordination of position and torque is essential for repeatability, which is itself a crucial component of product quality.

Smart drum sequencer

In addition to its overall versatility, this type of drum sequencer also runs in the sub-millisecond range, allowing exceptional process speeds without any reductions in product quality whatsoever.



Autotuning – Fully automatic controller parameterization

The autotuning function for drive axes makes it possible to provide the best possible parameters automatically in order to optimize the drive controller for the ACOPOSmulti drive system (includes the position controller and underlying speed controller). Not only are the control parameters detected while the machine is practically at a standstill, but the parameters to compensate for the effects of inertia and friction are also determined.

Procedure

Before the actual autotuning process, a safe operating range is specified where the drive can run while the control parameters are being set. The fully automatic controller parameterization is then started with a click of the mouse. Within a short time, the autotuning function determines the optimal controller configuration for the connected mechanical components. The parameters for reference variable feed-forward control are then calculated based on a defined drive movement. These include inertia as well as speed-proportional and static friction, for example.

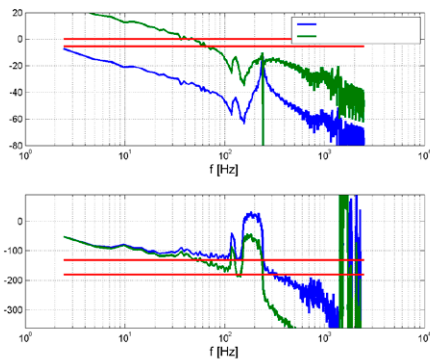
Quick and easy commissioning

The biggest advantage of autotuning is that it's easy. Automation Studio novices are supported when commissioning axes, while those without a lot of technical drive knowledge can also quickly achieve optimal results as well. There's even an expert mode for advanced users that allows the fine-tuning of individual control loops.

These possibilities make it easy for beginners and experts alike to maximize the dynamics of their drives. Extensive testing in the field has shown that this procedure is not only very robust even when using very different mechanical components and encoder systems, but also provides very good lag error characteristics. In most cases, manually adjusting the control parameters afterwards is not necessary.

Many different applications

The fact that the system isn't tied to one encoder means that there are many different applications possible. Typical applications involve highly dynamic direct drive torque motors and geared power transmission systems, drives with synchronous or induction motors and linear drives. Autotuning can also be used on machines with a restricted range of movement or direction – after it has been configured accordingly, of course. In addition, passive attenuation can be employed to prevent a reduction in dynamics caused by mechanical resonance in two-mass systems.





PLCopen motion control

Standardized programming

PLCopen motion control function blocks satisfy a longstanding demand for a standard that can handle positioning tasks quickly, easily and efficiently.

They can be programmed in the proven IEC 61131 standard programming languages Ladder Diagram (LD), Structured Text (ST) and the high-level programming language C.

All motor types supported by the ACOPOSmulti drive system such as synchronous motors, induction motors, linear motors, torque motors and direct drives can be controlled using these PLCopen function blocks.

The universal availability of PLCopen function blocks for all B&R products makes it possible to optimize the component selection to match the performance demands of every application perfectly.

As with the drive firmware, the PLCopen library is included in the Automation Studio package. Selecting the library automatically imports it into the project and allows the function blocks to be used for programming.

The PLCopen function blocks are divided into administrative motion control function blocks as well as function blocks for single- and multi-axis control.

Effective and transparent task implementation

Technology function blocks – open source function blocks based primarily on PLCopen function blocks and categorized by functionality – are also a perfect complement for standard applications.

ACOPOSmulti SafeMOTION inverter modules



B&R's well-established safety solution – consisting of X20 SafeIO modules, SafeLOGIC controllers and the SafeDESIGNER toolset in Automation Studio – is rounded off by ACOPOSmulti SafeMOTION inverter modules featuring B&R's integrated safety technology: SafeMOTION. All B&R "Integrated Safety Technology" products are optimized to work together, delivering elegant applications at extremely low cost levels.

ACOPOSmulti SafeMOTION inverter modules are available for EnDat 2.2 and SinCos encoder systems.

openSAFETY sets technical standards

Although there are many new approaches to safe fieldbus systems, most of them are restricted by proprietary standards and sluggish response times. The B&R safety system – including its ACOPOSmotor SafeMOTION modules – takes a different approach by implementing openSAFETY across the board. This approach allows integrated safety functions such as Safely Limited Speed to be activated directly over the network instead of having to wire these types of safety-related signals to the drive.

Information is collected directly from its source via safe digital inputs and outputs before being distributed to the respective sensors and actuators – in this case, the drive with integrated safety functions – via a safe CPU, the SafeLOGIC controller. Connecting over a POWERLINK network makes it easy to achieve the best possible communication between the SafeLOGIC controller and the standard controller for non safety-related program engineering.

Short cycle times

Cycle times of 800 μ s are achieved on ACOPOSmulti SafeMOTION inverter modules while still satisfying SIL 3 requirements.

Modular, expandable system

Because not all drives and axes in a production machine are safety-related, ACOPOSmulti inverter modules are offered both with and without integrated safety functionality (SafeMOTION). This makes it possible to combine safe and non-safe axes in an application as needed.

Safety functions

The following IEC 61800-5-2 safety functions are integrated in the drive through the use of ACOPOS-multi SafeMOTION EnDat 2.2 or SinCos inverter modules and because this component is implemented in the B&R safety system. Additionally, the safe speed and safe position are also provided for the SafeLOGIC controller. This makes it possible to combine safety functions in an application as needed.

Safe state

In safety-related systems, potentially dangerous situations are simply unacceptable, even in the event of an error. This is ensured by a two-channel hardware and firmware structure as well as by the system architecture.

The closed-circuit principle is applied here. In the event of an error, torque and power are switched off on the drive.

Safe speed and Safe position

If a safety encoder is installed in a system, then the SafeLOGIC controller can request the current speed of the motor encoder over the safe network and use that information as an input signal in the safety application. The signal achieves SIL 2 with an EnDat 2.2 safety encoder and max. SIL 3 with a SinCos encoder (depending on the encoder used) as defined in EN 61508.

Encoder

EnDat 2.2 safety encoders or SinCos encoders are used to safely determine and evaluate the position or speed of the motor. Because they determine the position redundantly, they satisfy SIL 2 or max. SIL 3 requirements (depending on the encoder used). The following safety functions are only available when using EnDat 2.2 safety encoders or tested SinCos encoders for SafeMOTION SinCos inverter modules.

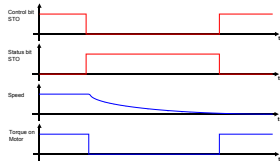
Overview of safety functions

The following table lists the safety functions integrated in ACOPOSmulti SafeMOTION inverter modules as well as the safety levels that can be achieved when they are used:

Safety function	EN ISO 13849-1		EN 61508 / EN 62061		Safe Encoder evaluation necessary
	EnDat 2.2	SinCos	EnDat 2.2	SinCos	
Safe Torque Off (STO)	PL e / CAT 4	PL e / CAT 4	SIL 3	SIL 3	No
Safe Torque Off One Channel (STO1)	PL d / CAT 3	PL d / CAT 3	SIL 2	SIL 2	No
Safe Operating Stop (SOS)	PL d / CAT 3	Max. PL e / CAT 4*	SIL 2	Max. SIL 3*	Yes
Safe Stop 1 (SS1)	Time-based monitoring: PL e / CAT 4 Ramp-based monitoring: PL d / CAT 3	Time-based monitoring: PL e / CAT 4 Ramp-based monitoring: Max. PL e / CAT 4*	Time-based monitoring: SIL 3 Ramp-based monitoring: SIL 2	Time-based monitoring: SIL 3 Ramp-based monitoring: Max. SIL 3*	Time-based monitoring: No Ramp-based monitoring: Yes
Safe Stop 2 (SS2)	PL d / CAT 3	Max. PL e / CAT 4*	SIL 2	Max. SIL 3*	Yes
Safely Limited Speed (SLS)	PL d / CAT 3	Max. PL e / CAT 4*	SIL 2	Max. SIL 3*	Yes
Safe Maximum Speed (SMS)	PL d / CAT 3	Max. PL e / CAT 4*	SIL 2	Max. SIL 3*	Yes
Safe Direction (SDI)	PL d / CAT 3	Max. PL e / CAT 4*	SIL 2	Max. SIL 3*	Yes
Safely Limited Increment (SLI)	PL d / CAT 3	Max. PL e / CAT 4*	SIL 2	Max. SIL 3*	Yes
Safely Limited Acceleration (SLA)	PL d / CAT 3	Max. PL e / CAT 4*	SIL 2	Max. SIL 3*	Yes
Safe Brake Control (SBC)	PL d / CAT 3	PL d / CAT 3	SIL 2	SIL 2	No
Safely Limited Position (SLP)	PL d / CAT 3	Max. PL e / CAT 4*	SIL 2	Max. SIL 3*	Yes
Safe Maximum Position (SMP)	PL d / CAT 3	Max. PL e / CAT 4*	SIL 2	Max. SIL 3*	Yes
Safe Homing	PL d / CAT 3	Max. PL e / CAT 4*	SIL 2	Max. SIL 3*	Yes
Safe Brake Test (SBT)	-	Max. PL d / CAT 3*	-	Max. SIL 2*	Yes
Remanent Safe Position (RSP)	PL d / CAT 3	-	SIL 2	-	Yes

* Depends on the encoder used

STO - Safe Torque Off

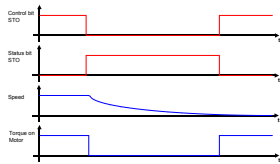


Safe Torque Off is the status in which the drive motor is no longer supplied with power (i.e. no torque and force being generated). The power supply to the drive is safely cut off by activating safe pulse disabling in a secure manner. Because the drive is no longer able to generate torque, it is impossible for any potentially dangerous movements to occur.

STO is made available to SafeLOGIC as an integrated safety function and can therefore be requested directly over the network, eliminating the need for external wiring.

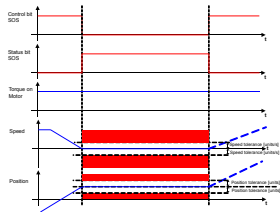
The STO safety function provides the foundation for all other safety functions. As the implementation of the closed-circuit principle, it is applied every time an error occurs.

STO1 - Safe Torque Off, single channel



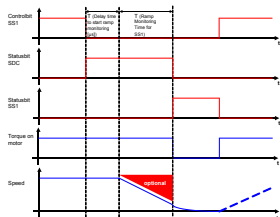
The STO1 safety function works in the same way as STO. The sole difference is that either only the HighSide or only the Low-Side IGBTs are cut off depending on the configuration.

SOS - Safe Operating Stop



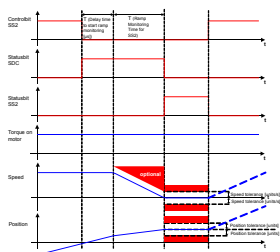
Safe Operating Stop (SOS) is the state in which the drive is monitored for coming to a safe stop. The drive is supplied with power and can therefore generate torque and force. All control functions between the electronic controller and the drive motor are active. The axis standstill is monitored using a configurable standstill tolerance window. Both the position as well as the speed are monitored. In order to collect the speed and position data in a safe manner, a suitable safety encoder is required. If the standstill monitoring limits are violated, safe pulse disabling is activated immediately and the drive switches to an error state that must be acknowledged.

SS1 - Safe Stop 1



The Safe Stop 1 (SS1) safety function monitors a motor as it transitions from motion to standstill. When completely decelerated, safe pulse disabling is activated to cut off all torque and power to the drive. Depending on the requirements for the safety function, it is possible to monitor either only the deceleration time or the deceleration ramp. If the monitoring limits are violated during deceleration, safe pulse disabling is activated immediately and an error state requiring acknowledgment is triggered. One advantage of monitoring the deceleration ramp is that it reduces the assumed remaining distance to standstill when an error occurs.

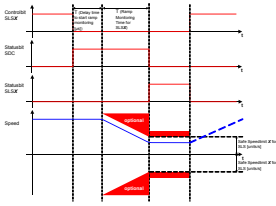
SS2 - Safe Stop 2



During Safe Stop 2 (SS2), transition of a moving motor to stop is monitored for safety. The drive must then be kept at standstill by the standard application. As with SOS, this standstill is monitored by the SafeMOTION module according to the configured standstill tolerance window.

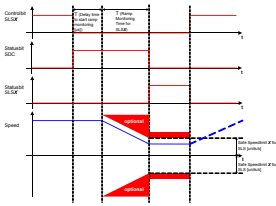
As with SS1, it is possible to monitor either only the deceleration time or also the deceleration ramp depending on the requirements of the safety function. If a violation is detected during ramp monitoring or the subsequent standstill monitoring, safe pulse disabling is activated immediately and an error state requiring acknowledgment is triggered.

SLS - Safe Limited Speed



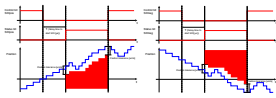
The SLS safety function monitors the drive to make sure that the configurable limits for speed are not exceeded. It is also possible to monitor deceleration until the limit is reached if needed by the application. Depending on requirements, deceleration ramp monitoring can be configured to either only monitor the deceleration period or to monitor the deceleration ramp as well. If a violation is detected during deceleration or when monitoring the limit speed, safe pulse disabling is activated immediately and an error state requiring acknowledgment is triggered.

SMS - Safe Maximum Speed



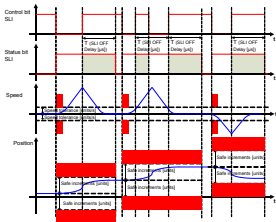
The difference between SMS and SLS is that SMS cannot be actively requested. It is either enabled or disabled by the configuration. When enabled, the current speed is constantly monitored against a defined limit. If the limit is exceeded, safe pulse disabling is activated immediately and an acknowledgeable error state is triggered.

SDI - Safe Direction



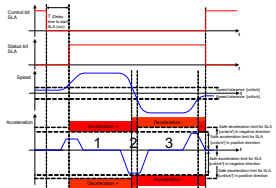
The SDI safety function monitors the defined direction of movement. If the interval is violated, safe pulse disabling is activated immediately and an acknowledgeable error state is triggered. Either the positive or negative direction can be monitored. The safe direction function can be enabled in parallel with other safety functions. For example, SLS can be limited to a certain direction.

SLI - Safely Limited Interval



With the SLI safety function, the movement is monitored for a defined number of increments. The safe axis must be at a standstill when this function is enabled. A position window is then generated that is safety-monitored. This position window depends on the configured safe interval. If the interval is violated, safe pulse disabling is activated immediately and an acknowledgeable error state is triggered.

SLA - Safely Limited Acceleration/Deceleration



The SLA safety function is used to monitor the acceleration or deceleration with respect to defined maximum limits. The limits for acceleration and deceleration are monitored in the positive direction of movement. The configured limits are monitored after the configured time has expired. This delay time compensates for the different runtimes of the standard and safety applications.

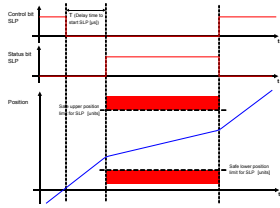
SBC - Safe Brake Control



Safe Brake Control (SBC) sends a safe output signal to control an external brake. The SBC integrated safety function can be requested either explicitly via SafeLOGIC or when a module error occurs. Depending on the quality of the connected brake and its wiring, the function can fulfill SBC SIL 2 in accordance to EN 61508.

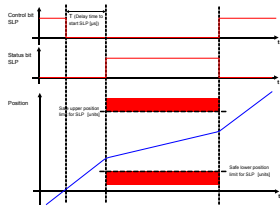
System features

SLP - Safe Limited Position



The purpose of the SLP safety function is to monitor a specified position window. Parameters can be used to configure the lower and upper positioning limits of the monitoring range. When the position limit is approached, the monitored speed limit is calculated in such a way that the drive will come to a full stop before the positioning limit is reached using the configured deceleration ramp parameter.

SMP - Safe Maximum Position

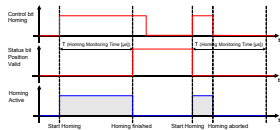


The difference between SMP (Safe Maximum Position) and SLP is that SMP cannot be actively requested. It is either enabled or disabled by the configuration.

When enabled, the current position is constantly monitored against a defined position window. The SMP safety function only works with homed axes since it requires a safe absolute position.

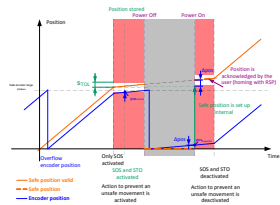
As with the SLP safety function, the SMP function also monitors a position-dependent speed limit in addition to the position in order to minimize the remaining distance if the position window is exceeded.

Safe Homing



The Safe Homing function provides a way to establish a reference between the encoder position and the machine position. Depending on the homing mode, it may be necessary for the drive to perform a homing procedure. A homing procedure requires the control functions between the electronic controller and the drive motor to be active. Other safety functions might have to be selected in order to prevent a hazardous state during the homing procedure.

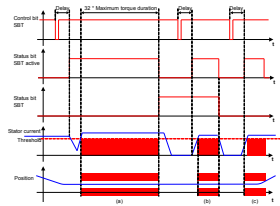
RSP - Remanent Safe Position



With the RSP safety function, after the safe position has been homed once to the machine position, the homed safe position does not have to be homed again after a power off/on cycle.

It is only possible to store valid position data after a controlled standstill of the drive. The standstill must therefore be ensured. It must also be ensured that no power is supplied to the drive while the data is being saved so that it is not possible for the drive to move. These requirements are met when using the STO and SOS safety functions.

SBT - Safe Brake Test



The SBT (Safe Brake Test) safety function allows an engaged brake to be tested by applying a configurable stator current for a certain period of time.

The SBT safety function is not a conventional safety function! It is only used to test an engaged holding brake by applying a configurable stator current for a certain period of time.

The test is carried out at the specified safety level and with the specified precision.

Safe machine options

The primary method for configuring a SafeMOTION module is to set the parameters in SafeDESIGNER and transfer them to the SafeLOGIC controller along with the safety application. From there, they are transferred to the SafeMOTION module. These parameters are labeled as "Default parameters" and require the use of SafeDESIGNER.

The safety function "Safe machine options" is used to configure additional parameters without using SafeDESIGNER. This makes it possible to modify the parameters of the SafeMOTION module from the standard application. The safe machine options are transferred from the standard application to the SafeLOGIC controller as a data block, and stored there permanently.

Configuration of an ACOPOSmulti drive system

The ACOPOSmulti drive system consists of a mounting plate, various modules (power supply, auxiliary supply, inverter, expansion and capacitor modules), plug-in modules as well as a line filter and – only in combination with 8BVP active power supply modules – a power regeneration choke.

There are 10 steps necessary to configure the ACOPOSmulti:

1. Determine the cooling method.
 - Standard cooling (wall mounting)
 - Feed-through cooling (feed-through mounting)
 - Oil/Water cooling (cold plate mounting)
2. Define or verify the supply voltage range and mains type.
3. Select the ACOPOSmulti inverter modules according to the application requirements.
 - 1-axis modules
 - 2-axis modules
4. Select the ACOPOSmulti plug-in modules for the motor encoder and external axis encoder according to the application requirements.
5. Determine if it should be possible to extend the ACOPOSmulti drive system:
If so, determine the number of optional slots on the mounting plate for other ACOPOSmulti modules
6. Select ACOPOSmulti power supply modules according to the application requirements (active/passive power supply module) based on the total power of the ACOPOSmulti inverter modules needed
(derating information must be taken into consideration if the supply voltage <math>< 3 \times 400 \text{ VAC}</math>)
 - Passive power supply modules¹
 - Active power supply modules
7. Check the maximum chargeable DC bus capacitance.
8. Select the ACOPOSmulti auxiliary supply module based on the total power required for the 24 VDC supply of the selected ACOPOSmulti module, ACOPOSmulti plug-in modules as well as the peripheral supply (e.g. PLC, actuators, motor holding brakes, sensors)
 - 24 V internal
 - 24 V internal, 24 V external
 - 24 V internal, 24 V external, 24 V external feed
 - 42 V external
9. Determine the total number of slots by adding the widths of all selected ACOPOSmulti modules (including optional slots).
10. Select the ACOPOSmulti mounting plate according to the total number of slots required and specified cooling method.

¹ Step 8 can be skipped if the 24 VDC is supplied to the selected ACOPOSmulti modules by the 8B0P0110Hx00.000-1 passive power supply module.

Product overview

ACOPOSmulti



Passive line filters

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Active line filters

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Power regeneration chokes

 685

Mounting plates



Wall mounting

 688



Cold plate mounting

 691



Feed-through mounting

 694

Passive power supply modules



4 kW

697



8-16 kW

700

Active power supply modules



15-30 kW

705



60 kW

708



120 kW

710

Auxiliary power supply modules



24 V internal

713



24 V internal, 24 V external

715



24 V internal, 24 V external, 24 V external supply

718



42 V internal

721

Product overview

Inverter modules



1-axis modules 1.4-11 kW

 725



1-axis modules 16-32 kW

 728



1-axis modules 48-64 kW

 731



1-axis modules 120 kW

 734



2-axis modules 1.4-5.5 kW







 740







2-axis modules 11-16 kW

 743

Inverter modules, Safe MOTION EnDat 2.2

	1-axis modules 1.4-11 kW	748
	1-axis modules 16-32 kW	752
	1-axis modules 48-64 kW	756
	1-axis modules 120 kW	760
	2-axis modules 1.4-5.5 kW	766
	2-axis modules 11-16 kW	770

Inverter modules, Safe MOTION SinCos

	1-axis modules 1.4-11 kW	777
	1-axis modules 16-32 kW	781
	1-axis modules 48-64 kW	785
	1-axis modules 120 kW	789

Product overview



Expansion modules

 793



Capacitor modules

 797

Plug-in modules



Encoder modules

 801



I/O modules

 812

























Accessories



Braking resistors

 817

Cables for use in cable drag chains

	0.75 mm ² motor cables	 819
	1.5 mm ² motor cables	 820
	4 mm ² motor cables	 821
	4 mm ² motor cables with size 1.5 motor connector	 822
	10 mm ² motor cables	 823
	10 mm ² motor cables with ring connectors	 824
	1.5 mm ² hybrid motor cables	 825
	4 mm ² hybrid motor cables	 826
	2.5 mm ² hybrid motor cables, food grade	 827
	EnDat 2.1 cables	 828
	EnDat 2.2 cables	 829
	Resolver cables	 830

Product overview



Expansion cables

831

Cables not for use in cable drag chains



0.75 mm² motor cables, not for use in cable drag chains

834



0.75 mm² ESTB motor cables, not for use in cable drag chains

835



1.5 mm² motor cables, not for use in cable drag chains

836



4 mm² motor cables, not for use in cable drag chains

837



EnDat 2.1 cables, not for use in cable drag chains

838



Resolver cables, not for use in cable drag chains

839



ESTB Resolver cables, not for use in cable drag chains

840

Cable extensions



1.5 mm² motor cables

 841



4 mm² motor cables

 842



10 mm² motor cables

 843



EnDat 2.1 cables

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Resolver cables

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ESTB Resolver cables

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Product overview

Accessories



Feed-through receptacles

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Terminal block

 847



Terminals blocks

 850



Shield component sets

 854



Fan modules

 855



Fuse sets

 857

Passive line filters

Technical data for all modules

Power mains connection

Frequency	0 to 60 Hz
-----------	------------

Operating conditions

Permitted mounting orientations	
Hanging vertically	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 1000 m
Maximum ¹⁾	4000 m
Degree of pollution in accordance with EN 60664-1	In preparation
EN 60529 protection	IP20

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum ²⁾	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ Continuous operation at elevations ranging from 1000 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

²⁾ Continuous operation at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

Passive line filters

8B0F0160H000.A00-1, 8B0F0300H000.000-1, 8B0F0550H000.000-1



- Wider power input voltage range
- Optimally suited for ACOPOS-multi 8B0P power supply modules
- Adherence to the limit values specified in CISPR11, Group 2, Class A

General information	8B0F0160H000.A00-1	8B0F0300H000.000-1	8B0F0550H000.000-1
Cooling and mounting method	Wall mounting		
Certification			
KC	-		Yes
CE	-		Yes
cULus		Yes	
Power mains connection	8B0F0160H000.A00-1	8B0F0300H000.000-1	8B0F0550H000.000-1
Permissible power mains forms	-		TT, TN ¹⁾
Mains input voltage	3x 275 to 3x 480 VAC ±10%		3x 300 to 3x 520 VAC ±10%
Allocation to the power supply module		8B0P0220Hx00.00x-1	8B0P0440Hx00.00x-1
Continuous current ²⁾	16 A _{eff}	30 A _{eff}	55 A _{eff}
Peak current	24 A _{eff} (<1 min)	45 A _{eff} (<1 min)	82.5 A _{eff} (<1 min)
Reduction of continuous current according to the ambient temperature above 40°C	In preparation		
Reduction of continuous current depending on the installation elevation			
Starting at 1000 m above sea level	0.8 A _{eff} per 1000 m	1.5 A _{eff} per 1000 m	2.75 A _{eff} per 1000 m
Power loss ³⁾		11.8 W	25.9 W
Line filter in accordance with EN 61800-3, Category C3 ⁴⁾		Yes	
Design			
L1, L2, L3 and L1', L2', L3'		Terminals	
PE	M5 threaded bolt		M6 threaded bolt
Shield connection			
On the mains		No	
On the device		No	
Terminal connection cross section			
Flexible and fine wire lines			
With wire end sleeves		Max. 10 mm ²	Max. 16 mm ²
Approbation data			
UL/C-UL-US		8	4
CSA		8	4
Operating conditions	8B0F0160H000.A00-1	8B0F0300H000.000-1	8B0F0550H000.000-1
Permitted mounting orientations			
Lying horizontally		Yes	
Overvoltage category in accordance with IEC 60950	II		
EN 60529 protection	IP20		
Mechanical characteristics	8B0F0160H000.A00-1	8B0F0300H000.000-1	8B0F0550H000.000-1
Dimensions			
Width	45 mm	50 mm	85 mm
Height	250 mm	270 mm	250 mm
Depth	70 mm	85 mm	90 mm
Weight	0.8 kg	1.2 kg	2 kg

¹⁾ In the USA, TT and TN power mains are commonly referred to as "Delta/Wye with grounded Wye neutral".

²⁾ Valid in the following conditions: 3x 480 VAC mains input voltage, 50°C ambient temperature, cos phi = 0.8. The exact value depends on the respective application.

³⁾ Valid in the following conditions: 25°C ambient temperature, frequency 50 Hz.

⁴⁾ Limit values from EN 61800-3 C3 (second environment). In order to conform to the EMC limit values, all 8BVI inverter modules in the drive system connected to the 8B0F line filter must be operated at the nominal switching frequency (5 kHz). The total length of all motor cables on each drive system (and for each 8B0F line filter) can be a maximum of 250 m. The cable length between the 8B0F line filter and the 8B0P power supply module can be a maximum of 5 m. The maximum motor cable length per motor connection must also be taken into consideration (see 8BVI inverter modules).

For technical data relevant to all modules, see 679.

Active line filters

Technical data for all modules

Power mains connection

Frequency	50 / 60 Hz ±4%
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Fan connection

Terminal connection cross section	
Flexible and fine wire lines	
With wire end sleeves	0.25 to 2.50 mm ²
Approbation data	
UL/C-UL-US	30 to 12
CSA	28 to 12

Temperature sensor connection

Terminal connection cross section	
Flexible and fine wire lines	
With wire end sleeves	0.25 to 2.50 mm ²
Approbation data	
UL/C-UL-US	30 to 12
CSA	28 to 12

Operating conditions

Permitted mounting orientations	
Hanging vertically	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ¹⁾	4000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	III
EN 60529 protection	IP20

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum ²⁾	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

²⁾ Continuous operation at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

Active line filters

8BVF0220H000.000-1, 8BVF0440H000.001-2, 8BVF0880H000.000-1



- Wider power input voltage range
- Optimally suited for ACOPOS-multi 8BVP power supply modules
- Adherence to the limit values specified in CISPR11, Group 2, Class A

General information	8BVF0220H000.000-1	8BVF0440H000.001-2	8BVF0880H000.000-1
Cooling and mounting method	Wall mounting		
Certification			
CE		Yes	
cULus		Yes	
KC		Yes	
Power mains connection	8BVF0220H000.000-1	8BVF0440H000.001-2	8BVF0880H000.000-1
Permissible power mains forms	TT, TN ¹⁾		
Mains input voltage	3x 220 to 3x 480 VAC ±10%		
Allocation to the power supply module	8BVP0220HC00.000-1 8BVP0220HW00.000-1	8BVP0440HC00.000-1 8BVP0440HW00.000-1	8BVP0880HC00.00x-1 8BVP0880HW00.00x-1
Continuous current ²⁾	22.5 A _{eff}	45 A _{eff}	90 A _{eff}
Peak current <10 s	56 A _{eff}		180 A _{eff}
Reduction of continuous current according to the ambient temperature above 40°C	No reduction	0.4 A _{eff} per °C	1 A _{eff} per °C
Reduction of continuous current depending on the installation elevation			
Starting at 1000 m above sea level	1.8 A _{eff}	3.6 A _{eff}	7.2 A _{eff}
Power loss at nominal current	85 W	210 W	980 W
Integrated line filter in accordance with EN 61800-3, Category C3 ³⁾	Yes		
Design			
L1, L2, L3, PE and L1', L2', L3', PE		Male connector	Feed-through terminals
PE		M5 threaded bolt	No
Shield connection			
On the mains		No	
On the device		Yes ⁴⁾	
Terminal connection cross section			
Flexible and fine wire lines			
With wire end sleeves		0.5 to 16 mm ²	10 to 50 mm ²
Approbation data			
UL/C-UL-US		20 to 6	6 to 1/0
CSA		20 to 6	6 to 1/0
Terminal cable cross section dimension of shield connection	12 to 22 mm	23 to 35 mm	32 to 50 mm
Fan connection	8BVF0220H000.000-1	8BVF0440H000.001-2	8BVF0880H000.000-1
Max. power consumption during operation (P _{Fan8BVF...})	8.25 W		
Design			
F+, F-		Male connector	
Temperature sensor	8BVF0220H000.000-1	8BVF0440H000.001-2	8BVF0880H000.000-1
Design			
T+, T-		Male connector	
Operating conditions	8BVF0220H000.000-1	8BVF0440H000.001-2	8BVF0880H000.000-1
Permitted mounting orientations			
Lying horizontally	Yes		
EN 60529 protection	IP20		

8BVF0220H000.000-1, 8BVF0440H000.001-2, 8BVF0880H000.000-1

Mechanical characteristics	8BVF0220H000.000-1	8BVF0440H000.001-2	8BVF0880H000.000-1
Dimensions			
Width		135 mm	175 mm
Height		378 mm	436 mm
Depth			212 mm
Weight	11.6 kg	15 kg	23.5 kg

¹⁾ In the USA, TT and TN power mains are commonly referred to as "Delta/Wye with grounded Wye neutral".

²⁾ Valid in the following conditions: 40°C ambient temperature, installation elevation <500 m above sea level.

³⁾ Limit values from EN 61800-3 C3 (second environment). In order to conform to the EMC limit values, the 8BVP power supply module connected to the 8BVF line filter must be operated at the nominal switching frequency (5 kHz). The total length of all motor cables on each drive system (and for each 8BVF line filter) can be a maximum of 900 m. The cable length between the 8BVF line filter and the 8BVP power supply module can be a maximum of 5 m. The maximum motor cable length per motor connection must also be taken into consideration (see 8BVI inverter modules).

⁴⁾ The cable does not require shielding up to a total cable length of 3 m between the line filter, power regeneration choke and power supply module. Please contact B&R when using cable lengths >3 m.

For technical data relevant to all modules, see  681.

Power regeneration chokes

Features

- Connection for temperature sensor
- Optimally suited for ACOPOSmulti 8BVP power supply modules

Technical data for all modules

Power mains connection

Frequency	50 / 60 Hz ±4%
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Temperature sensor

Terminal connection cross section	
-----------------------------------	--

Flexible and fine wire lines	
------------------------------	--

With wire end sleeves	0.5 to 2.5 mm ²
-----------------------	----------------------------

Approbation data	
------------------	--

UL/C-UL-US	30 to 12
------------	----------

CSA	26 to 12
-----	----------

Operating conditions

Permitted mounting orientations	
---------------------------------	--

Hanging vertically	No
--------------------	----

Standing horizontally	Yes
-----------------------	-----

Installation at elevations above sea level	
--	--

Nominal	0 to 500 m
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Maximum ¹⁾	4000 m
-----------------------	--------

Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
---	------------------------------

Overvoltage category in accordance with IEC 60364-4-443:1999	III
--	-----

Environmental conditions

Temperature	
-------------	--

Operation	
-----------	--

Nominal	5 to 40°C
---------	-----------

Maximum ²⁾	55°C
-----------------------	------

Storage	-25 to 55°C
---------	-------------

Transport	-25 to 70°C
-----------	-------------

Relative humidity	
-------------------	--

Operation	5 to 85%
-----------	----------

Storage	5 to 95%
---------	----------

Transport	Max. 95% at 40°C
-----------	------------------

¹⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

²⁾ Continuous operation at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

Technical data



8BVR0220H000.100-1

8BVR0440H000.100-2

8BVR0880H000.100-2

8BVR1650H000.100-1

General information

Cooling and mounting method	Wall mounting			
Certification				
CE	Yes			
cULus	Yes			
KC	Yes			-

Power mains connection

Mains input voltage	3x 220 to 3x 480 VAC ±10%			
Allocation to the power supply module	8BVP0220HC00.000-1 8BVP0220HW00.000-1	8BVP0440HC00.000-1 8BVP0440HW00.000-1	8BVP0880HC00.00x-1 8BVP0880HW00.00x-1	8BVP1650HC00.00x-1
Continuous current ¹⁾	22.5 A _{eff}	45 A _{eff}	90 A _{eff}	180 A _{eff}
Peak current <10 s	56 A _{eff}	90 A _{eff}	180 A _{eff}	360 A _{eff}
Reduction of continuous current depending on the ambient temperature				
Horizontal mounting orientation	-		In preparation	-
Vertical mounting orientation	No reduction		In preparation	
Reduction of continuous current depending on the installation elevation				
Starting at 1000 m above sea level	1.8 A _{eff} per 1000 m	3.6 A _{eff} per 1000 m	7.2 A _{eff} per 1,000 m	14.4 A _{eff} per 1000 m
Power loss at nominal current	130 W	260 W	391 W	750 W
Design				
U1, V1, W1		Terminals		M10 threaded bolts
U2, V2, W2		Terminals		M10 threaded bolts
Shield connection ²⁾				
On the mains			No	
On the device			No	
Terminal connection cross section				
Solid core / multiple-conductor lines	1.5 to 25 mm ²		2.5 to 50 mm ²	-
Flexible and fine wire lines				
With wire end sleeves	1.5 to 16 mm ²		2.5 to 35 mm ²	6 to 120 mm ² ³⁾
Approbation data				
UL/C-UL-US	18 to 4		12 to 1	10 AWG to 250 kcmil
CSA	18 to 4		12 to 2	10 AWG to 250 kcmil

Temperature sensor

Design				
T+, T-			Terminals	

Operating conditions

Permitted mounting orientations				
Lying horizontally	No		Yes	No
EN 60529 protection	IP00			

Power regeneration chokes

Technical data

8BVR0220H000.100-1

8BVR0440H000.100-2

8BVR0880H000.100-2

8BVR1650H000.100-1

Mechanical characteristics

Dimensions

Width	245 mm	270 mm	289 mm	465 mm
Height	270 mm	285 mm	412 mm	350 mm
Depth	103 mm	136 mm	157 mm	300 mm
Weight	10.5 kg	Approx. 17 kg	32.7 kg	Approx. 79 kg

¹⁾ Valid in the following conditions: Mounting orientation "standing horizontally", 40°C ambient temperature, installation elevation <500 m above sea level.

²⁾ The cable does not require shielding up to a total cable length of 3 m between the line filter, power regeneration choke and power supply module. Please contact B&R when using cable lengths >3 m.

³⁾ The connection is made with cable lugs using an M10 threaded bolt.

For technical data relevant to all modules, see  **684**.

Mounting plates

Features

- Groundbreaking power distribution system
- Integrated distribution of the power and auxiliary voltage supply
- Protection against accidental contact
- Optional slots possible

Technical data for all modules

DC bus connection

Voltage	
Nominal	750 VDC
Continuous power ¹⁾	200 kW
Cross section	
DC+, DC-	72 mm ²
PE	72 mm ²

24 VDC auxiliary supply

Voltage	25 VDC ±1.6%
Continuous power ¹⁾	1500 W
Reduction of continuous power depending on the installation elevation	
Starting at 500 m above sea level	150 W per 1000 m
Cross section	
24 VDC, COM	21.3 mm ²

Operating conditions

Permitted mounting orientations	
Hanging vertically	Yes
Lying horizontally	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ²⁾	4000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	III

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum ³⁾	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ Valid in the following conditions: 40°C ambient temperature, installation elevation <500 m above sea level.

²⁾ Continuous operation of ACOPOSmulti mounting plates at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous power reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

³⁾ Continuous operation of ACOPOSmulti mounting plates at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous power reductions into consideration).

Mounting plates - Wall mounting

Technical data



8B0M0020HW00.000-1

8B0M0030HW00.000-1

8B0M0040HW00.000-1

8B0M0050HW00.000-1

8B0M0060HW00.000-1

8B0M0070HW00.000-1

8B0M0080HW00.000-1

8B0M0090HW00.000-1

8B0M0100HW00.000-1

8B0M0110HW00.000-1

General information

Number of slots	2	3	4	5	6	7	8	9	10	11
Cooling and mounting method	Wall mounting									
Certification										
CE	Yes									
cULus	Yes									

DC bus connection

Continuous power ¹⁾	200 kW									
Reduction of continuous power depending on the installation elevation										
Starting at 500 m above sea level	20 kW per 1000 m									

24 VDC auxiliary supply

Max. power consumption per slot ($P_{Fan8B0M...}$)	8.25 W ²⁾									
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Operating conditions

Permitted mounting orientations										
Lying horizontally	Yes									
Flatness of mounting surface	Flatness of 1 mm over the entire mounting surface									
EN 60529 protection	IP20									

Mechanical characteristics

Dimensions ³⁾										
Width	107 mm	160.5 mm	214 mm	267.5 mm	321 mm	374.5 mm	428 mm	481.5 mm	535 mm	588.5 mm
Height	385 mm									
Depth	13.5 mm									
Weight	1.05 kg	1.6 kg	2.1 kg	2.7 kg	3.2 kg	3.7 kg	4.2 kg	4.8 kg	5.3 kg	5.8 kg

¹⁾ Valid in the following conditions: 40°C ambient temperature, installation elevation <500 m above sea level.

²⁾ Corresponds to the proportionate power consumption of the fan modules on the mounting plate.

³⁾ The dimensions define the size of the mounting plate. Make sure to leave additional space above and below the backplanes for mounting, connections and air circulation.

Technical data



8B0M0120HW00.000-1

8B0M0130HW00.000-1

8B0M0140HW00.000-1

8B0M0150HW00.000-1

8B0M0160HW00.000-1

8B0M0170HW00.000-1

8B0M0180HW00.000-1

8B0M0190HW00.000-1

General information

Number of slots	12	13	14	15	16	17	18	19
Cooling and mounting method	Wall mounting							
Certification								
CE	Yes							
cULus	Yes							

DC bus connection

Continuous power ¹⁾	200 kW							
Reduction of continuous power depending on the installation elevation								
Starting at 500 m above sea level	20 kW per 1000 m							

24 VDC auxiliary supply

Max. power consumption per slot ($P_{Fan8B0M...}$)	8.25 W ²⁾							
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Operating conditions

Permitted mounting orientations								
Lying horizontally	Yes							
Flatness of mounting surface	Flatness of 1 mm over the entire mounting surface							
EN 60529 protection	IP20							

Mechanical characteristics

Dimensions ³⁾								
Width	642 mm	695.5 mm	749 mm	802.5 mm	856 mm	909.5 mm	963 mm	1016.5 mm
Height	385 mm							
Depth	13.5 mm							
Weight	6.4 kg	6.9 kg	7.4 kg	8 kg	8.5 kg	9 kg	9.5 kg	10.1 kg

¹⁾ Valid in the following conditions: 40°C ambient temperature, installation elevation <500 m above sea level.

²⁾ Corresponds to the proportionate power consumption of the fan modules on the mounting plate.

³⁾ The dimensions define the size of the mounting plate. Make sure to leave additional space above and below the backplanes for mounting, connections and air circulation.

Mounting plates - Wall mounting

Technical data



8B0M0200HW00.000-1

8B0M0210HW00.000-1

8B0M0220HW00.000-1

8B0M0230HW00.000-1

8B0M0240HW00.000-1

8B0M0250HW00.000-1

8B0M0260HW00.000-1

8B0M0270HW00.000-1

General information

Number of slots	20	21	22	23	24	25	26	27
Cooling and mounting method	Wall mounting							
Certification								
CE	Yes							
cULus	Yes							

DC bus connection

Continuous power ¹⁾	200 kW							
Reduction of continuous power depending on the installation elevation								
Starting at 500 m above sea level	20 kW per 1000 m							

24 VDC auxiliary supply

Max. power consumption per slot ($P_{Fan8B0M...}$)	8.25 W ²⁾							
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Operating conditions

Permitted mounting orientations								
Lying horizontally	Yes							
Flatness of mounting surface	Flatness of 1 mm over the entire mounting surface							
EN 60529 protection	IP20							

Mechanical characteristics

Dimensions ³⁾								
Width	1070 mm	1123.5 mm	1177 mm	1230.5 mm	1284 mm	1337.5 mm	1391 mm	1444.5 mm
Height	385 mm							
Depth	13.5 mm							
Weight	10.6 kg	11.1 kg	11.7 kg	12.2 kg	12.7 kg	13.3 kg	13.8 kg	14.3 kg

¹⁾ Valid in the following conditions: 40°C ambient temperature, installation elevation <500 m above sea level.

²⁾ Corresponds to the proportionate power consumption of the fan modules on the mounting plate.

³⁾ The dimensions define the size of the mounting plate. Make sure to leave additional space above and below the backplanes for mounting, connections and air circulation.

For technical data relevant to all modules, see 687.

Mounting plates - Cold plate mounting

Technical data



8B0M0020HC00.000-1

8B0M0030HC00.000-1

8B0M0040HC00.000-1

8B0M0050HC00.000-1

8B0M0060HC00.000-1

8B0M0070HC00.000-1

8B0M0080HC00.000-1

8B0M0090HC00.000-1

8B0M0100HC00.000-1

8B0M0110HC00.000-1

General information

Number of slots	2	3	4	5	6	7	8	9	10	11
Cooling and mounting method	Cold plate mounting									
Certification										
CE	Yes									
cULus	Yes									

DC bus connection

Continuous power ¹⁾	200 kW									
Reduction of continuous power depending on the installation elevation										
Starting at 500 m above sea level	20 kW per 1000 m									

Operating conditions

Permitted mounting orientations										
Lying horizontally	Yes									
Flatness of mounting surface	Flatness of 1 mm over the entire mounting surface									
Flow volume										
Minimum	3 l/min ²⁾									
Maximum	6 l/min ²⁾									
Pressure drop depending on the flow volume										
3 l/min	Typ. 0.3 bar									
6 l/min	Typ. 0.7 bar									
Test pressure	10 bar for 1 minute, air inside, water outside									
Max. continuous pressure ³⁾	5 bar									
Max. ambient return temperature	60°C									
EN 60529 protection	IP20									

Mechanical characteristics

Dimensions										
Width	147.5 mm	201 mm	254.5 mm	308 mm	361.5 mm	415 mm	468.5 mm	522 mm	575.5 mm	629 mm
Height	378 mm									
Depth	17 mm									
Weight	1.9 kg	2.85 kg	3.8 kg	4.7 kg	5.6 kg	6.6 kg	7.5 kg	8.5 kg	9.4 kg	10.3 kg

¹⁾ Valid in the following conditions: 40°C ambient temperature, installation elevation <500 m above sea level.

²⁾ Valid in the following conditions: Mounting plate with max. 27 slots, cooling medium: tap water. Values vary depending on the cooling medium and/or connection fitting being used!

³⁾ The requirements of the complete system (tubing, heat exchangers, recooling systems, etc.) as well as any necessary application-specific requirements must be taken into consideration.

Mounting plates - Cold plate mounting

Technical data



8B0M0120HC00.000-1

8B0M0130HC00.000-1

8B0M0140HC00.000-1

8B0M0150HC00.000-1

8B0M0160HC00.000-1

8B0M0170HC00.000-1

8B0M0180HC00.000-1

8B0M0190HC00.000-1

General information

Number of slots	12	13	14	15	16	17	18	19
Cooling and mounting method	Cold plate mounting							
Certification								
CE	Yes							
cULus	Yes							

DC bus connection

Continuous power ¹⁾	200 kW							
Reduction of continuous power depending on the installation elevation								
Starting at 500 m above sea level	20 kW per 1000 m							

Operating conditions

Permitted mounting orientations								
Lying horizontally	Yes							
Flatness of mounting surface	Flatness of 1 mm over the entire mounting surface							
Flow volume								
Minimum	3 l/min ²⁾							
Maximum	6 l/min ²⁾							
Pressure drop depending on the flow volume								
3 l/min	Typ. 0.3 bar							
6 l/min	Typ. 0.7 bar							
Test pressure	10 bar for 1 minute, air inside, water outside							
Max. continuous pressure ³⁾	5 bar							
Max. ambient return temperature	60°C							
EN 60529 protection	IP20							

Mechanical characteristics

Dimensions ⁴⁾								
Width	682.5 mm	736 mm	789.5 mm	843 mm	896.5 mm	950 mm	1003.5 mm	1057 mm
Height	378 mm							
Depth	17 mm							
Weight	11.3 kg	12.2 kg	13.2 kg	14.1 kg	15 kg	16 kg	16.9 kg	17.9 kg

¹⁾ Valid in the following conditions: 40°C ambient temperature, installation elevation <500 m above sea level.

²⁾ Valid in the following conditions: Mounting plate with max. 27 slots, cooling medium: tap water. Values vary depending on the cooling medium and/or connection fitting being used!

³⁾ The requirements of the complete system (tubing, heat exchangers, recooling systems, etc.) as well as any necessary application-specific requirements must be taken into consideration.

⁴⁾ The dimensions define the size of the mounting plate. Make sure to leave additional space above and below the backplanes for mounting, connections and air circulation.

Technical data



8B0M0200HC00.000-1

8B0M0210HC00.000-1

8B0M0220HC00.000-1

8B0M0230HC00.000-1

8B0M0240HC00.000-1

8B0M0250HC00.000-1

8B0M0260HC00.000-1

8B0M0270HC00.000-1

General information

Number of slots	20	21	22	23	24	25	26	27
Cooling and mounting method	Cold plate mounting							
Certification								
CE	Yes							
cULus	Yes							

DC bus connection

Continuous power ¹⁾	200 kW							
Reduction of continuous power depending on the installation elevation								
Starting at 500 m above sea level	20 kW per 1000 m							

Operating conditions

Permitted mounting orientations								
Lying horizontally	Yes							
Flatness of mounting surface	Flatness of 1 mm over the entire mounting surface							
Flow volume								
Minimum	3 l/min ²⁾							
Maximum	6 l/min ²⁾							
Pressure drop depending on the flow volume								
3 l/min	Typ. 0.3 bar							
6 l/min	Typ. 0.7 bar							
Test pressure	10 bar for 1 minute, air inside, water outside							
Max. continuous pressure ³⁾	5 bar							
Max. ambient return temperature	60°C							
EN 60529 protection	IP20							

Mechanical characteristics

Dimensions ⁴⁾								
Width	1110.5 mm	1164 mm	1217.5 mm	1271 mm	1324.5 mm	1378 mm	1431.5 mm	1485 mm
Height	378 mm							
Depth	17 mm							
Weight	18.8 kg	19.7 kg	20.7 kg	21.6 kg	22.6 kg	23.5 kg	24.4 kg	25.4 kg

¹⁾ Valid in the following conditions: 40°C ambient temperature, installation elevation <500 m above sea level.

²⁾ Valid in the following conditions: Mounting plate with max. 27 slots, cooling medium: tap water. Values vary depending on the cooling medium and/or connection fitting being used!

³⁾ The requirements of the complete system (tubing, heat exchangers, recooling systems, etc.) as well as any necessary application-specific requirements must be taken into consideration.

⁴⁾ The dimensions define the size of the mounting plate. Make sure to leave additional space above and below the backplanes for mounting, connections and air circulation.

For technical data relevant to all modules, see [687](#).

Mounting plates - Feed-through mounting

Technical data



8B0M0040HFF0.000-1

8B0M0080HFF0.000-1

8B0M0120HFF0.000-1

8B0M0160HFF0.000-1

8B0M0200HFF0.000-1

General information

Number of slots	4	8	12	16	20
Cooling and mounting method	Feed-through mounting				
Certification					
CE	Yes				
cULus	Yes				

DC bus connection

Continuous power ¹⁾	200 kW				
Reduction of continuous power depending on the installation elevation					
Starting at 500 m above sea level	20 kW per 1000 m				

24 VDC auxiliary supply

Max. power consumption per slot ($P_{Fan8B0M...}$)	8.25 W ²⁾				
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Operating conditions

Permitted mounting orientations					
Lying horizontally	Yes				
EN 60529 protection	IP64 Fan module: IP54 (8B0M0040HFF0.000-1)				

Mechanical characteristics

Dimensions ³⁾					
Width	278 mm	492 mm	706 mm	920 mm	1134 mm
Height	378 mm				
Depth	14 mm				
Weight	6.4 kg	12.8 kg	19.2 kg	25.6 kg	32 kg

¹⁾ Valid in the following conditions: 40°C ambient temperature, installation elevation <500 m above sea level.

²⁾ Corresponds to the proportionate power consumption of the 8B0M0040HFF0.000-1 fan module.

³⁾ The dimensions define the size of the mounting plate. Make sure to leave additional space above and below the backplanes for mounting, connections and air circulation.

For technical data relevant to all modules, see 687.

Passive power supply modules

Features

- Extensive input voltage range
- Integrated connection for external braking resistor

Technical data for all modules

Power mains connection

Mains configurations	TT, TN-S, TN-C-S ¹⁾	
Frequency	50 / 60 Hz ±4%	
Power loss with continuous power	In preparation	
Switch-on interval	>120 s	
Integrated power regeneration choke	No	
Capable of power regeneration	No	
Power factor correction (PFC)	No	

DC bus connection

Voltage		
Nominal	294 to 679 VDC	537 to 707 VDC
Reduction of continuous power depending on the cooling method	No reduction	In preparation
Power loss with continuous power	In preparation	
Protective measures		
Overload protection	Yes	
Short circuit and ground fault protection	No	
Design	ACOPOSMulti backplane	

24 VDC supply

Input voltage	25 VDC ±1.6%
Design	ACOPOSMulti backplane

Braking resistors ²⁾

Design	
RB+, RB-, PE	Male connector
Shield connection	Yes
Terminal connection cross section	
Flexible and fine wire lines	
With wire end sleeves	0.5 to 6 mm ²
Approbation data	
UL/C-UL-US	20 to 6
CSA	20 to 6
Terminal cable cross section dimension of shield connection	23 to 35 mm
Protective measures	
Overload protection	Yes
Short circuit and ground fault protection	Yes (with RB+ through externally replaceable blow-out fuse)

Operating conditions

Permitted mounting orientations	
Hanging vertically	Yes
Lying horizontally	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ³⁾	4000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	III
EN 60529 protection	IP20

Passive power supply modules

Environmental conditions

Temperature

Operation

Nominal

5 to 40°C

Maximum ⁴⁾

55°C

Storage

-25 to 55°C

Transport

-25 to 70°C

Relative humidity

Operation

5 to 85%

Storage

5 to 95%

Transport

Max. 95% at 40°C

Mechanical characteristics

Dimensions ⁵⁾

Height

317 mm

¹⁾ In the USA, TT and TN power mains are commonly referred to as "Delta/Wye with grounded Wye neutral".

²⁾ The power calculations are based on a DC bus voltage of 700 VDC.

Danger!

A component malfunction in the 8B0P passive power supply module can lead to continuous power output to the external braking resistor, causing it to overheat. This must be taken into account when selecting (e.g. intrinsic safety), organizing and operating the external braking resistor. Thermal monitoring and external cutoff devices should be implemented if necessary.

If B&R 8B0W braking resistors are used and the 8B0P power supply module is operated with a mains voltage of 3x 208 to 3x 480 VAC $\pm 10\%$, there is no need for thermal monitoring since B&R 8B0W braking resistors are intrinsically safe under these conditions.

³⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

⁴⁾ Continuous operation at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

⁵⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Passive power supply modules 4 kW

8B0P0110HW00.000-1, 8B0P0110HC00.000-1



General information	8B0P0110HW00.000-1	8B0P0110HC00.000-1
Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting
Certification		
CE		Yes
cULus		Yes
Power mains connection	8B0P0110HW00.000-1	8B0P0110HC00.000-1
Mains input voltage		3x 208 to 3x 480 VAC ±10%
Installed load		Max. 7.3 kVA
Starting current at 400 VAC		2 A
Max. DC bus capacitance that can be charged in relation to the supply voltage		
230 VAC		9 mF
400 VAC		3 mF
480 VAC		2 mF
Integrated line filter in accordance with EN 61800-3, Category C3 ¹⁾		Yes
Design		
L1, L2, L3, PE		Male connector
PE		M5 threaded bolt
Shield connection ²⁾		No
Terminal connection cross section		
Flexible and fine wire lines		
With wire end sleeves		0.5 to 16 mm ²
Approbation data		
UL/C-UL-US		20 to 6
CSA		20 to 6
Terminal cable cross section dimension of shield connection		23 to 35 mm
DC bus connection	8B0P0110HW00.000-1	8B0P0110HC00.000-1
Continuous power ³⁾		4 kW
Reduction of continuous power depending on the mains input voltage		
Mains input voltage <3x 400 VAC		10 W/V * (400 V - Mains input voltage)
Reduction of continuous power depending on the installation elevation		
Starting at 500 m above sea level		0.4 kW per 1000 m
Peak power output (supply)		12 kW
Power loss with continuous power		In preparation
DC bus capacitance		330 µF
24 VDC supply	8B0P0110HW00.000-1	8B0P0110HC00.000-1
Input capacitance		23.5 µF
Max. power consumption		12 W + P _{Fan8B0M...} ⁴⁾
24 VDC In	8B0P0110HW00.000-1	8B0P0110HC00.000-1
Input voltage		
Minimum		18 VDC
Nominal		24 VDC
Maximum		30 VDC
24 VDC internal system voltage supply		25 VDC ±1.6% (regulated)
Switch-on threshold		16 V
Max. continuous current		4.0 A
Status indicators		24 V LED
Undervoltage detection		Yes
Overvoltage detection		Yes

Passive power supply modules 4 kW

8B0P0110HW00.000-1, 8B0P0110HC00.000-1

Protective measures		
Open circuit protection		Yes
Overload protection		Yes
Short circuit protection		Yes
Overtemperature protection		Yes
Design		
24 VDC In, COM		Male connector
Terminal connection cross section of the input "24 VDC In"		
Flexible and fine wire lines		
With wire end sleeves		0.2 to 2.5 mm ²
Approbation data		
UL/C-UL-US		30 to 12
CSA		22 to 12
Braking resistors ⁵⁾	8B0P0110HW00.000-1	8B0P0110HC00.000-1
Peak power int. / ext.		2 kW / 24 kW (max. 1 s)
Continuous power int. / ext.		150 W / 8 kW ⁶⁾
Min. braking resistance		25 Ω
Rated current of the built-in fuse ⁷⁾		15 A (fast-acting)
Design		
Shield connection		Yes
Terminal connection cross section		
Flexible and fine wire lines		
With wire end sleeves		0.5 to 6 mm ²
Approbation data		
UL/C-UL-US		20 to 6
CSA		20 to 6
Operating conditions	8B0P0110HW00.000-1	8B0P0110HC00.000-1
Permitted mounting orientations		
Lying horizontally		Yes
EN 60529 protection		IP20
Mechanical characteristics	8B0P0110HW00.000-1	8B0P0110HC00.000-1
Dimensions ⁸⁾		
Width		53.5 mm
Height		317 mm
Depth		
Wall mounting	263 mm	-
Cold plate	-	212 mm
Feed-through mounting	-	209 mm
Weight		3.5 kg
Module width		1

8B0P0110HW00.000-1, 8B0P0110HC00.000-1

- ¹⁾ Limit values from EN 61800-3 C3 (second environment). The total length of all motor cables on each drive system (and for each 8B0P0110 power supply module) can be a maximum of 75 m. In order to conform to EMC limit values, the 8BVI inverter modules in the drive system are permitted to be operated at a maximum switching frequency of 10 kHz (at a switching frequency of 20 kHz, the total length of all motor cables on each drive system is reduced to a maximum length of 45 m). At a maximum switching frequency of 10 kHz, it is possible to conform to the limits specified in EN 61800-3 C2 when using an external line filter. The maximum motor cable length per motor connection must also be taken into consideration (see 8BVI inverter modules).
- ²⁾ The cable does not require shielding up to a total cable length of 3 m between the line filter and power supply module. Please contact B&R when using cable lengths >3 m.
- ³⁾ Valid in the following conditions: 3x 400 VAC mains input voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.
- ⁴⁾ The power consumption $P_{\text{Fan8B0M...}}$ corresponds to the portion of the power that is used by the fan modules in the 8B0M... mounting plate or by the 8B0M0040H-FF0.000-1 fan module and can be found in the technical data for the respective 8B0M... mounting plate.
- ⁵⁾ The power calculations are based on a DC bus voltage of 700 VDC.
- Danger!**
A component malfunction in the 8B0P passive power supply module can lead to continuous power output to the external braking resistor, causing it to overheat. This must be taken into account when selecting (e.g. intrinsic safety), organizing and operating the external braking resistor. Thermal monitoring and external cutoff devices should be implemented if necessary.
If B&R 8B0W braking resistors are used and the 8B0P power supply module is operated with a mains voltage of 3x 208 to 3x 480 VAC ±10%, there is no need for thermal monitoring since B&R 8B0W braking resistors are intrinsically safe under these conditions.
- ⁶⁾ Continuous power refers to the maximum braking power the ACOPOSmulti power supply module can exchange continuously. Depending on the application, the actual continuous power provided by the external braking resistor is limited by the rated current of fuse I_B (integrated in the ACOPOSmulti device) and the value of the external braking resistance R_{BR} .
- ⁷⁾ A Littelfuse KLK D 015 fuse must be used.
- ⁸⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  **695**.

Passive power supply modules 8-16 kW

Technical data



8B0P0220HW00.000-1

8B0P0220HC00.000-1

8B0P0220HW00.001-1

8B0P0220HC00.001-1

8B0P0440HW00.000-1

8B0P0440HC00.000-1

8B0P0440HW00.001-1

8B0P0440HC00.001-1

General information

Note	-		Integrated passive motor short circuit brake		-		Integrated passive motor short circuit brake	
Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification								
CE					Yes			
cULus					Yes			
KC							Yes	

Power mains connection

Mains input voltage			3x 380 to 3x 500 VAC ±10%					
Installed load	Max. 15.6 kVA						Max. 30.4 kVA	
Starting current at 400 VAC					10 A			
Max. DC bus capacitance that can be charged in relation to the supply voltage								
400 VAC	14.4 mF ¹⁾						14.4 mF ²⁾	
480 VAC	10 mF ³⁾						10 mF ⁴⁾	
Integrated line filter in accordance with EN 61800-3, Category C3 ⁵⁾					No			
Design								
L1, L2, L3, PE					Male connector			
PE					M5 threaded bolt			
Shield connection ⁶⁾					Yes			
Terminal connection cross section								
Flexible and fine wire lines								
With wire end sleeves					0.5 to 16 mm ²			
Approval data								
UL/C-UL-US					20 to 6			
CSA					20 to 6			
Terminal cable cross section dimension of shield connection					23 to 35 mm			

DC bus connection

Continuous power ⁷⁾	8 kW				16 kW			
Reduction of continuous power depending on the mains input voltage								
Mains input voltage <3x 400 VAC	20 W/V * (400 V - Mains input voltage)				40 W/V * (400 V - Mains input voltage)			
Reduction of continuous power depending on the installation elevation								
Starting at 500 m above sea level	0.8 kW per 1000 m				1.6 kW per 1000 m			
Peak power output (supply)	24 kW				48 kW			
Power loss with continuous power					In preparation			
DC bus capacitance	660 µF				1320 µF			

Passive power supply modules 8-16 kW

Technical data



8B0P0220HW00.000-1

8B0P0220HC00.000-1

8B0P0220HW00.001-1

8B0P0220HC00.001-1

8B0P0440HW00.000-1

8B0P0440HC00.000-1

8B0P0440HW00.001-1

8B0P0440HC00.001-1

24 VDC supply ⁸⁾

Input capacitance	23.5 μ F
Max. power consumption	$12 \text{ W} + 2 * P_{\text{Fan8B0M...}}^{\text{9)}$

Braking resistors ¹⁰⁾

Peak power output	40 kW (max. 1 s)	65 kW (max. 1 s)
Continuous power	3 kW	
Min. braking resistance	12 Ω	7.5 Ω
Rated current of the built-in fuse ¹¹⁾	30 A (fast-acting)	

Design		
Shield connection	Yes	
Terminal connection cross section		
Flexible and fine wire lines		
With wire end sleeves	0.5 to 6 mm ²	
Approbation data		
UL/C-UL-US	20 to 6	
CSA	20 to 6	

Operating conditions

Permitted mounting orientations		
Lying horizontally	Yes	
EN 60529 protection	IP20	

Mechanical characteristics

Dimensions ¹²⁾								
Width	106.5 mm							
Height	317 mm							
Depth								
Wall mounting	263 mm	-	263 mm	-	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm	-	209 mm	-	209 mm
Weight	Approx. 5.9 kg	Approx. 4.7 kg	Approx. 5.9 kg	Approx. 4.7 kg	Approx. 6.1 kg	Approx. 4.9 kg	Approx. 6.1 kg	Approx. 4.9 kg
Module width	2							

Technical data

- ¹⁾ Revisions <I0: 5.8 mF
- ²⁾ Revisions <G0: 5.8 mF
- ³⁾ Revisions <I0: 4 mF
- ⁴⁾ Revisions <G0: 4 mF
- ⁵⁾ Limit values from EN 61800-3 C3 (second environment).
- ⁶⁾ The cable does not require shielding up to a total cable length of 3 m between the line filter and power supply module. Please contact B&R when using cable lengths >3 m.
- ⁷⁾ Valid in the following conditions: 3x 400 VAC mains input voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.
- ⁸⁾ The power supply modules have an integrated DC bus power supply for the electronics. The 24 VDC supply from the ACOPOSmulti backplane only feeds the +24 VDC of the trigger inputs and the encoder power supplies on the encoder modules.
- ⁹⁾ The power consumption $P_{Fan8B0M...}$ corresponds to the portion of the power that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module. It can be found in the technical data for the respective 8B0M... mounting plate.
- ¹⁰⁾ The power calculations are based on a DC bus voltage of 700 VDC.
Danger!
A component malfunction in the 8B0P passive power supply module can lead to continuous power output to the external braking resistor, causing it to overheat. This must be taken into account when selecting (e.g. intrinsic safety), organizing and operating the external braking resistor. Thermal monitoring and external cutoff devices should be implemented if necessary.
If B&R 8B0W braking resistors are used and the 8B0P power supply module is operated with a mains voltage of 3x 380 to 3x 500 VAC $\pm 10\%$, there is no need for thermal monitoring since B&R 8B0W braking resistors are intrinsically safe under these conditions.
- ¹¹⁾ A Littelfuse KLK D 030 fuse must be used.
- ¹²⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  695.

Active power supply modules

Features

- Extensive input voltage range
- Capable of power regeneration
- Integrated connection for temperature sensors
- 2 slots for ACOPOSMulti plug-in modules

Technical data for all modules

General information	
Slots for plug-in modules	2
Power mains connection	
Mains configurations	TT, TN-S, TN-C-S ¹⁾
Frequency	50 / 60 Hz ±4%
Nominal switching frequency	5 kHz
Integrated line filter in accordance with EN 61800-3, Category C3 ²⁾	No
Integrated power regeneration choke	No
Capable of power regeneration	Yes
Power factor correction (PFC)	Yes
DC bus connection	
Voltage	
Nominal	750 VDC
Reduction of continuous power depending on the DC bus voltage (U_{DC})	
$U_{DC} < 750$ VDC	$P * (1 - U_{DC}/750)^3$
Protective measures	
Overload protection	Yes
Short circuit and ground fault protection	No
Design	ACOPOSMulti backplane
24 VDC supply	
Input voltage	25 VDC ±1.6%
Input capacitance	4.7 µF
Design	ACOPOSMulti backplane
24 VDC Out	
Quantity	2
Output voltage	
DC bus voltage (U_{DC}): 260 to 315 VDC	25 VDC * ($U_{DC} / 315$)
DC bus voltage (U_{DC}): 315 to 800 VDC	24 VDC ±6%
Protection	250 mA (slow-blow) electronic, automatic reset
Filter fan connection	
Output voltage	24 V +5.8% / -0.1%
Continuous current	4.2 A
Max. overcurrent limitation	10 A
Protective measures	
Overload protection	No
Short circuit protection	Yes
Open line monitoring	No
Undervoltage monitoring	No

Trigger inputs

Quantity	2
Wiring	Sink
Electrical isolation	
Input - Power supply module	Yes
Input - Input	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Switching threshold	
Low	<5 V
High	>15 V
Input current at nominal voltage	Approx. 10 mA
Switching delay	
Rising edge	52 μ s \pm 0.5 μ s (digitally filtered)
Falling edge	53 μ s \pm 0.5 μ s (digitally filtered)
Modulation compared to ground potential	Max. \pm 38 V

Operating conditions

Permitted mounting orientations	
Hanging vertically	Yes
Lying horizontally	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ⁴⁾	4000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	III
EN 60529 protection	IP20

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum ⁵⁾	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ In the USA, TT and TN power mains are commonly referred to as "Delta/Wye with grounded Wye neutral".

²⁾ Limit values from EN 61800-3 C3 (second environment).

³⁾ P ... Actual continuous power available (value adjusted to the actual environmental conditions)

⁴⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

⁵⁾ Continuous operation at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

Power supply modules 15-30 kW

Technical data



8BVP0220HW00.000-1

8BVP0220HC00.000-1

8BVP0440HW00.000-1

8BVP0440HC00.000-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification				
CE			Yes	
cULus			Yes	
KC			Yes	

Power mains connection

Mains input voltage	3x 220 to 3x 480 VAC ±10%			
Installed load ¹⁾	Max. 15.6 kW			Max. 31.1 kW
Starting current at 400 VAC			Max. 67 A	
Max. DC bus capacitance that can be charged in relation to the supply voltage				
230 VAC			17.4 mF	
400 VAC			5.8 mF	
480 VAC			4 mF	
Possible switching frequencies ²⁾			5 / 10 kHz	
Integrated line filter in accordance with EN 61800-3, Category C3 ³⁾			No	
Design				
L1, L2, L3, PE			Male connector	
PE			M5 threaded bolt	
Shield connection ⁴⁾			Yes	
Terminal connection cross section				
Flexible and fine wire lines				
With wire end sleeves			0.5 to 16 mm ²	
Approbation data				
UL/C-UL-US			20 to 6	
CSA			20 to 6	
Terminal cable cross section dimension of shield connection			23 to 35 mm	

DC bus connection

Continuous power (supply and power regeneration) ⁵⁾	15 kW			30 kW
Reduction of continuous power depending on the mains input voltage				
Mains input voltage <3x 400 VAC	37.5 W/V * (400 V - Mains input voltage)		75 W/V * (400 V - Mains input voltage)	
Reduction of continuous power depending on the switching frequency ⁶⁾				
Switching frequency 5 kHz	No reduction ⁷⁾	-	1.11 kW/K (from 40°C) ⁷⁾	-
Switching frequency 10 kHz	0.27 kW/K (from 31°C)	-	0.35 kW/K (from -10°C) ⁸⁾	-
Reduction of continuous power depending on the switching frequency and mounting method ⁹⁾				
Switching frequency 5 kHz				

Power supply modules 15-30 kW

Technical data



8BVP0220HW00.000-1

8BVP0220HC00.000-1

8BVP0440HW00.000-1

8BVP0440HC00.000-1

Cold plate mounting ¹⁰⁾	-	No reduction ⁷⁾	-	0.56 kW/K (from 45°C) ⁷⁾
Feed-through mounting	-	No reduction ⁷⁾	-	In preparation
Switching frequency 10 kHz				
Cold plate mounting ¹⁰⁾	-	0.33 kW/K (from 49°C)	-	0.43 kW/K (from 6°C) ¹¹⁾
Feed-through mounting	-	0.37 kW/K (from 40°C)	-	In preparation
Reduction of continuous power depending on the installation elevation				
Starting at 500 m above sea level	1.5 kW per 1000 m		3 kW per 1000 m	
Peak power (supply and power regeneration)	37.5 kW		60 kW	
Power loss depending on the switching frequency ¹²⁾				
Switching frequency 5 kHz	[0.28*P ² +7.9*P+40] W		[0.15*P ² +10.5*P+40] W	
Switching frequency 10 kHz	[0.9*P ² +5.3*P+110] W		[0.42*P ² +16*P+130] W	
DC bus capacitance	495 µF		825 µF	
24 VDC supply				
Input capacitance			4.7 µF	
Max. power consumption	27 W + P _{SLOT1} + P _{SLOT2} + P _{24 V Out} + P _{Fan8BVF...} + 2 * P _{Fan8B0M...} ¹³⁾		25 W + P _{SLOT1} + P _{SLOT2} + P _{24 V Out} + P _{Fan8BVF...} + 2 * P _{Fan8B0M...} ¹³⁾	
24 VDC Out				
Quantity			2	
Output voltage				
DC bus voltage (U _{DC}): 260 to 315 VDC			25 VDC * (U _{DC} / 315)	
DC bus voltage (U _{DC}): 315 to 800 VDC			24 VDC ±6%	
Protection			250 mA (slow-blow) electronic, automatic reset	
Trigger inputs				
Electrical isolation				
Input - Power supply module			Yes	
Operating conditions				
Permitted mounting orientations				
Lying horizontally			Yes	
EN 60529 protection			IP20	
Mechanical characteristics				
Dimensions ¹⁴⁾				
Width			106.5 mm	
Height			317 mm	
Depth				
Wall mounting	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm
Weight	Approx. 5.2 kg	Approx. 4.2 kg	Approx. 5.5 kg	Approx. 4.5 kg
Module width			2	

Technical data

- ¹⁾ The specified value includes the heat dissipation from the respective 8BVF line filter and 8BVR power regeneration choke.
- ²⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous power and increases the CPU load.
- ³⁾ Limit values from EN 61800-3 C3 (second environment).
- ⁴⁾ The cable does not require shielding up to a total cable length of 3 m between the line filter, power regeneration choke and power supply module. Please contact B&R when using cable lengths >3 m.
- ⁵⁾ Valid in the following conditions: 3x 400 VAC mains input voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.
- ⁶⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.
- ⁷⁾ Value for the nominal switching frequency.
- ⁸⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
- ⁹⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).
- ¹⁰⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.
- ¹¹⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.
- ¹²⁾ Valid at a mains input voltage of 400 VAC. P ... Continuous power [kW].
- ¹³⁾ P_{SLOT1} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT1 (see the technical data for the respective plug-in module).
 P_{SLOT2} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).
 $P_{\text{24 V Out}}$... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).
 P_{Fan8BVF} ... Power [W] that is output to the connections X4A/F- and X4A/F+ on the module (see the technical data for the respective 8BVF... line filter).
 P_{Fan8BOM} ... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).
- ¹⁴⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  703.

Power supply modules 60 kW

8BVP0880HW00.004-1, 8BVP0880HC00.004-1



General information	8BVP0880HW00.004-1	8BVP0880HC00.004-1
Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting
Certification		
CE		Yes
cULus		Yes
KC		Yes
Power mains connection	8BVP0880HW00.004-1	8BVP0880HC00.004-1
Mains input voltage		3x 220 to 3x 480 VAC ±10%
Installed load ¹⁾		Max. 62 kW
Starting current at 400 VAC		Max. 133 A
Max. DC bus capacitance that can be charged in relation to the supply voltage		
230 VAC		34.8 mF
400 VAC		11.5 mF
480 VAC		8 mF
Possible switching frequencies ²⁾		5 / 10 kHz
Integrated line filter in accordance with EN 61800-3, Category C3 ³⁾		No
Design		
L1, L2, L3, PE		M8 threaded bolt
Shield connection ⁴⁾		Yes
Connection cross section range		
Flexible and fine wire lines		6 to 50 mm ² ⁵⁾
Approbation data		
UL/C-UL-US		In preparation
CSA		In preparation
Terminal cable cross section dimension of shield connection		32 to 50 mm
DC bus connection	8BVP0880HW00.004-1	8BVP0880HC00.004-1
Continuous power (supply and power regeneration) ⁶⁾		60 kW
Reduction of continuous power depending on the mains input voltage		
Mains input voltage <3x 400 VAC		150 W/V * (400 V - Mains input voltage)
Reduction of continuous power depending on the switching frequency ⁷⁾		
Switching frequency 5 kHz	0.97 kW/K (from 41°C) ⁸⁾	-
Switching frequency 10 kHz	0.64 kW/K (from -5°C) ⁹⁾	-
Reduction of continuous power depending on the switching frequency and mounting method ¹⁰⁾		
Switching frequency 5 kHz		
Cold plate mounting ¹¹⁾	-	1.3 kW/K (from 58°C) ⁸⁾
Feed-through mounting	-	In preparation
Switching frequency 10 kHz		
Cold plate mounting ¹¹⁾	-	0.95 kW/K (from 27°C)
Feed-through mounting	-	In preparation
Reduction of continuous power depending on the installation elevation		
Starting at 500 m above sea level		6 kW per 1000 m
Peak power (supply and power regeneration)		120 kW
Power loss depending on the switching frequency ¹²⁾		
Switching frequency 5 kHz		[0.065*P ² +11.4*P+90] W
Switching frequency 10 kHz		[0.22*P ² +16.1*P+185] W
DC bus capacitance		1650 µF

8BVP0880HW00.004-1, 8BVP0880HC00.004-1

24 VDC supply	8BVP0880HW00.004-1	8BVP0880HC00.004-1
Input capacitance		4.7 µF
Max. power consumption	$27 \text{ W} + P_{\text{SLOT1}} + P_{\text{SLOT2}} + P_{24 \text{ V Out}} + P_{\text{Fan8BVF...}} + 4 * P_{\text{Fan8BOM...}}$ ¹³⁾	
24 VDC Out	8BVP0880HW00.004-1	8BVP0880HC00.004-1
Quantity		2
Output voltage		
DC bus voltage (U _{DC}): 260 to 315 VDC		25 VDC * (U _{DC} / 315)
DC bus voltage (U _{DC}): 315 to 800 VDC		24 VDC ±6%
Protection	250 mA (slow-blow) electronic, automatic reset	
Trigger inputs	8BVP0880HW00.004-1	8BVP0880HC00.004-1
Electrical isolation		
Input - Power supply module		Yes
Operating conditions	8BVP0880HW00.004-1	8BVP0880HC00.004-1
Permitted mounting orientations		
Lying horizontally		Yes
EN 60529 protection		IP20
Mechanical characteristics	8BVP0880HW00.004-1	8BVP0880HC00.004-1
Dimensions ¹⁴⁾		
Width		213.5 mm
Height		317 mm
Depth		
Wall mounting	263 mm	-
Cold plate	-	212 mm
Feed-through mounting	-	209 mm
Weight	Approx. 10.9 kg	Approx. 7.9 kg
Module width		4

¹⁾ The specified value includes the heat dissipation from the respective 8BVF line filter and 8BVR power regeneration choke.

²⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous power and increases the CPU load.

³⁾ Limit values from EN 61800-3 C3 (second environment).

⁴⁾ The cable does not require shielding up to a total cable length of 3 m between the line filter, power regeneration choke and power supply module. Please contact B&R when using cable lengths >3 m.

⁵⁾ The connection is made with cable lugs using an M8 threaded bolt. The rated cross section of the cable lug must match the wire cross section of the cable that is to be connected.

⁶⁾ Valid in the following conditions: 3x 400 VAC mains input voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁷⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁸⁾ Value for the nominal switching frequency.

⁹⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

¹⁰⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).

¹¹⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

¹²⁾ Valid at a mains input voltage of 400 VAC. P ... Continuous power [kW].

¹³⁾ P_{SLOT1} ... Max. power consumption P_{BBAC} [W] of the plug-in module in SLOT1 (see the technical data for the respective plug-in module).

P_{SLOT2} ... Max. power consumption P_{BBAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).

P_{24 V Out} ... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

P_{Fan8BVF...} ... Power [W] that is output to the connections X4A/F- and X4A/F+ on the module (see the technical data for the respective 8BVF... line filter).

P_{Fan8BOM...} ... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8BOM0040HFF0.000-1 fan module (see the technical data for the respective 8BOM... mounting plate / 8BOM0040HFF0.000-1 fan module).

¹⁴⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  703.

Power supply modules 120 kW

8BVP1650HC00.000-1, 8BVP1650HW00.000-1



General information	8BVP1650HC00.000-1	8BVP1650HW00.000-1
Cooling and mounting method	Cold plate or feed-through mounting	Wall mounting
Certification		
CE		Yes
cULus		Yes
KC		Yes
Power mains connection	8BVP1650HC00.000-1	8BVP1650HW00.000-1
Mains input voltage		3x 220 to 3x 480 VAC ±10%
Installed load ¹⁾		Max. 124 kW
Starting current at 400 VAC		Max. 102 A
Max. DC bus capacitance that can be charged in relation to the supply voltage		
230 VAC		69.7 mF
400 VAC		23 mF
480 VAC		16 mF
Possible switching frequencies ²⁾		5 / 10 kHz
Integrated line filter in accordance with EN 61800-3, Category C3 ³⁾		No
Design		
L1, L2, L3, PE		M8 threaded bolt
Shield connection ⁴⁾		Yes
Connection cross section range		
Flexible and fine wire lines		10 to 95 mm ² ⁵⁾
Approbation data		
UL/C-UL-US		In preparation
CSA		In preparation
Terminal cable cross section dimension of shield connection		32 to 50 mm
DC bus connection	8BVP1650HC00.000-1	8BVP1650HW00.000-1
Continuous power (supply and power regeneration) ⁶⁾		120 kW
Reduction of continuous power depending on the mains input voltage		
Mains input voltage <3x 400 VAC		300 W/V * (400 V - Mains input voltage)
Reduction of continuous power depending on the switching frequency ⁷⁾		
Switching frequency 5 kHz	-	In preparation ⁸⁾
Switching frequency 10 kHz	-	In preparation
Reduction of continuous power depending on the switching frequency and mounting method ⁹⁾		
Switching frequency 5 kHz		
Cold plate mounting ¹⁰⁾	2.3 kW/K (from 53°C) ⁸⁾	-
Feed-through mounting	In preparation	-
Switching frequency 10 kHz		
Cold plate mounting ¹⁰⁾	1.3 kW/K (from 17°C)	-
Feed-through mounting	In preparation	-
Reduction of continuous power depending on the installation elevation		
Starting at 500 m above sea level		12 kW per 1000 m
Peak power (supply and power regeneration)		240 kW
Power loss depending on the switching frequency ¹¹⁾		
Switching frequency 5 kHz		[0.043 * P ² + 8.09 * P + 1452] W
Switching frequency 10 kHz		[0.053 * P ² + 8.76 * P + 2084] W
DC bus capacitance		3630 µF

8BVP1650HC00.000-1, 8BVP1650HW00.000-1

24 VDC supply	8BVP1650HC00.000-1	8BVP1650HW00.000-1
Input capacitance		4.7 µF
Max. power consumption	$37 \text{ W} + P_{\text{SLOT1}} + P_{\text{SLOT2}} + P_{24 \text{ V Out}} + P_{\text{Fan8BVF...}} + 4 * P_{\text{Fan8BOM...}}$ ¹²⁾	
24 VDC Out	8BVP1650HC00.000-1	8BVP1650HW00.000-1
Quantity		2
Output voltage		
DC bus voltage (U _{DC}): 260 to 315 VDC		25 VDC * (U _{DC} / 315)
DC bus voltage (U _{DC}): 315 to 800 VDC		24 VDC ±6%
Protection	250 mA (slow-blow) electronic, automatic reset	
Trigger inputs	8BVP1650HC00.000-1	8BVP1650HW00.000-1
Electrical isolation		
Input - Power supply module		Yes
Operating conditions	8BVP1650HC00.000-1	8BVP1650HW00.000-1
Permitted mounting orientations		
Lying horizontally		Yes
EN 60529 protection		IP20
Mechanical characteristics	8BVP1650HC00.000-1	8BVP1650HW00.000-1
Dimensions ¹³⁾		
Width		427.5 mm
Height		317 mm
Depth		
Wall mounting	-	263 mm
Cold plate	212 mm	-
Feed-through mounting	209 mm	-
Weight	Approx. 18.4 kg	26 kg
Module width		8

¹⁾ The specified value includes the heat dissipation from the respective 8BVF line filter and 8BVR power regeneration choke.

²⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous power and increases the CPU load.

³⁾ Limit values from EN 61800-3 C3 (second environment).

⁴⁾ The cable does not require shielding up to a total cable length of 3 m between the line filter, power regeneration choke and power supply module. Please contact B&R when using cable lengths >3 m.

⁵⁾ The connection is made with cable lugs using an M8 threaded bolt. The rated cross section of the cable lug must match the wire cross section of the cable that is to be connected.

⁶⁾ Valid in the following conditions: 3x 400 VAC mains input voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

⁷⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁸⁾ Value for the nominal switching frequency.

⁹⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).

¹⁰⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

¹¹⁾ Valid at a mains input voltage of 400 VAC. P ... Continuous power [kW].

¹²⁾ P_{SLOT1} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT1 (see the technical data for the respective plug-in module).

P_{SLOT2} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).

P_{24 V Out} ... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

P_{Fan8BVF...} ... Power [W] that is output to the connections X4A/F- and X4A/F+ on the module (see the technical data for the respective 8BVF... line filter).

P_{Fan8BOM...} ... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8BOM0040HFF0.000-1 fan module (see the technical data for the respective 8BOM... mounting plate / 8BOM0040HFF0.000-1 fan module).

¹³⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  703.

Auxiliary supply modules

Features

Properties for all modules

- Extensive protective measures

Properties for 24 V internal and 24 V external auxiliary supply modules

- Connections for supplying external 24 V devices

Properties for 24 V internal and 24 V external ACOPOSmulti auxiliary supply modules and 24 V external feed

- Input for connecting an external 24 VDC source (e.g. UPS)
- Connections for supplying external 24 V devices

Properties for internal 42 V auxiliary supply modules

- Connections for supplying external 42 V devices

Technical data for all modules

DC bus connection

Voltage	
Nominal	750 VDC
Operating range in continuous operation	260 to 800 VDC
Full continuous power	315 to 800 VDC
Design	ACOPOSmulti backplane

Operating conditions

Permitted mounting orientations	
Hanging vertically	Yes
Lying horizontally	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ¹⁾	4000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	III
EN 60529 protection	IP20

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

Auxiliary supply modules 24 V internal

Technical data



8B0C0160HW00.000-1

8B0C0160HC00.000-1

8B0C0320HW00.000-1

8B0C0320HC00.000-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification				
CE			Yes	
cULus			Yes	
KC			Yes	

DC bus connection

Continuous power consumption	Max. 445 W			Max. 880 W
Power loss with continuous power	45 W			80 W
DC bus capacitance			220 nF	

24 VDC output

Continuous power ¹⁾	400 W			800 W
Output voltage				
DC bus voltage (U_{DC}): 260 to 315 VDC			25 VDC * ($U_{DC} / 315$)	
DC bus voltage (U_{DC}): 315 to 800 VDC			24 VDC $\pm 6\%$	
Continuous current	16 ADC			32 ADC
Reduction of continuous power depending on an ambient temperature above 40°C			No reduction	
Reduction of continuous power depending on the installation elevation				
Starting at 500 m above sea level	40 W per 1000 m			80 W per 1000 m
Reduction of continuous power depending on the cooling method			No reduction	
Startup delay			Max. 1 s	
Startup time			Approx. 5 to 20 ms	
Residual ripple			Typ. 50 mV _{SS}	

24 VDC internal system voltage supply

Output voltage ²⁾			25 VDC $\pm 1.6\%$	
Peak current (<4 s)				
DC bus voltage (U_{DC}): 350 to 800 VDC	21 ADC			42 ADC
Protective measures				
Open circuit protection			Yes	
Overload protection			Yes	
Short circuit protection			Yes	
Feedback protection			Max. 26 VDC (also when turned off)	
Overtemperature protection			Yes	
Dielectric strength to ground			± 50 VDC	
Output/Input isolation			SELV / PELV requirements	
Design			ACOPOSmulti backplane	

Auxiliary supply modules 24 V internal

Technical data

8B0C0160HW00.000-1

8B0C0160HC00.000-1

8B0C0320HW00.000-1

8B0C0320HC00.000-1

Operating conditions

Permitted mounting orientations

Lying horizontally Yes

EN 60529 protection IP20

Mechanical characteristics

Dimensions ³⁾

Width 53 mm

Height 317 mm

Depth

Wall mounting	263 mm	-	263 mm	-
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Cold plate	-	212 mm	-	212 mm
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Feed-through mounting	-	209 mm	-	209 mm
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Weight	Approx. 3 kg	Approx. 2.5 kg	Approx. 3 kg	Approx. 2.5 kg
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Module width	1			
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¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 55°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ When a fault occurs, the output voltage is limited to a max. of 60 VDC.

³⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see [712](#).

Auxiliary supply modules 24 V internal, 24 V external

Technical data



8B0C0160HW00.001-1

8B0C0160HC00.001-1

8B0C0320HW00.002-1

8B0C0320HC00.002-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification				
CE			Yes	
cULus			Yes	
KC			Yes	

DC bus connection

Continuous power consumption	Max. 445 W			Max. 880 W
Power loss with continuous power	45 W			80 W
DC bus capacitance		220 nF		

24 VDC output

Continuous power ¹⁾	400 W			800 W
Output voltage				
DC bus voltage (U_{DC}): 260 to 315 VDC			25 VDC * ($U_{DC} / 315$)	
DC bus voltage (U_{DC}): 315 to 800 VDC			24 VDC $\pm 6\%$	
Continuous current	16 ADC			32 ADC
Reduction of continuous power depending on an ambient temperature above 40°C			No reduction	
Reduction of continuous power depending on the installation elevation				
Starting at 500 m above sea level	40 W per 1000 m			80 W per 1000 m
Reduction of continuous power depending on the cooling method			No reduction	
Startup delay			Max. 1 s	
Startup time			Approx. 5 to 20 ms	
Residual ripple			Typ. 50 mV _{SS}	
Terminal connection cross section of 24 VDC Out 1 output				
Flexible and fine wire lines				
With wire end sleeves	0.5 to 6 mm ²			-
Approbation data				
UL/C-UL-US	22 to 10			-
CSA	22 to 10			-
Terminal connection cross section of 24 VDC Out 2 output				
Flexible and fine wire lines				
With wire end sleeves	0.2 to 2.5 mm ²			-
Approbation data				
UL/C-UL-US	22 to 12			-
CSA	22 to 12			-

Auxiliary supply modules 24 V internal, 24 V external

Technical data

	8B0C0160HW00.001-1	8B0C0160HC00.001-1	8B0C0320HW00.002-1	8B0C0320HC00.002-1
24 VDC internal system voltage supply				
Output voltage ²⁾	25 VDC ±1.6%			
Peak current (<4 s)				
DC bus voltage (U _{DC}): 350 to 800 VDC	21 ADC			42 ADC
Protective measures				
Open circuit protection	Yes			
Overload protection	Yes			
Short circuit protection	Yes			
Feedback protection	Max. 26 VDC (also when turned off)			
Overtemperature protection	Yes			
Dielectric strength to ground	±50 VDC			
Output/Input isolation	SELV / PELV requirements			
Design	ACOPOSmulti backplane			
24 VDC Out				
Output voltage ²⁾				
DC bus voltage (U _{DC}): 260 to 315 VDC	25 VDC * (U _{DC} / 315)			
DC bus voltage (U _{DC}): 315 to 800 VDC	24 VDC ±6%			
Protection of 24 VDC Out 1 output	16 A (slow-blow) electronic, automatic reset			32 A (slow-blow) electronic, automatic reset
Protection of 24 VDC Out 2 output	5 A (slow-blow) electronic, automatic reset			
Protective measures				
Open circuit protection	Yes			
Overload protection	Yes			
Short circuit protection	Yes			
Feedback protection	Max. 35 VDC (also when turned off)			
Overtemperature protection	Yes			
Dielectric strength to ground	±50 VDC			
Output/Input isolation	SELV / PELV requirements			
Design				
24 VDC, COM	Male connector			
Terminal connection cross section of 24 VDC Out 1 output				
Flexible and fine wire lines				
With wire end sleeves	-			0.25 to 6 mm ²
Approbation data				
UL/C-UL-US	-			22 to 10
CSA	-			22 to 10
Terminal connection cross section of 24 VDC Out 2 output				
Flexible and fine wire lines				
With wire end sleeves	-			0.25 to 2.5 mm ²
Approbation data				
UL/C-UL-US	-			22 to 12
CSA	-			22 to 12

Technical data

8B0C0160HW00.001-1

8B0C0160HC00.001-1

8B0C0320HW00.002-1

8B0C0320HC00.002-1

24 VDC Out 1 controller input

Wiring	Sink		
Electrical isolation			
Input - 24 VDC	Yes		
Modulation compared to ground potential	Max. ±50 V		
Input voltage			
Nominal	24 VDC		
Maximum	30 VDC		
Switching threshold			
Low (24 VDC Out 1 is switched on)	<5 V		
High (24 VDC Out 1 is switched off) ³⁾	>15 V		
Input current at nominal voltage	Approx. 10 mA		
Switching delay			
ON (24 VDC Out 1 is switched on)	Max. 25 ms		
OFF (24 VDC Out 1 is switched off)	Max. 0.25 ms		
Design	Male connector		
Terminal connection cross sections			
Flexible and fine wire lines			
With wire end sleeves	0.2 to 2.5 mm ²		0.25 to 2.5 mm ²
Approbation data			
UL/C-UL-US	30 to 12		
CSA	22 to 12		

Operating conditions

Permitted mounting orientations			
Lying horizontally	Yes		
EN 60529 protection	IP20		

Mechanical characteristics

Dimensions ⁴⁾			
Width	53 mm		
Height	317 mm		
Depth			
Wall mounting	263 mm	-	263 mm
Cold plate	-	212 mm	-
Feed-through mounting	-	209 mm	-
Weight	Approx. 3.2 kg	Approx. 2.7 kg	Approx. 3.2 kg
Module width	1		

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 55°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ When a fault occurs, the output voltage is limited to a max. of 60 VDC.

³⁾ The output and any connected loads are not actively discharged when switched off.

⁴⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  712.

Auxiliary supply modules 24 V internal, 24 V external, 24 V external supply

8B0C0320HW00.00A-1, 8B0C0320HC00.00A-1



General information	8B0C0320HW00.00A-1	8B0C0320HC00.00A-1
Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting
Certification		
CE		Yes
cULus		Yes
DC bus connection	8B0C0320HW00.00A-1	8B0C0320HC00.00A-1
Continuous power consumption		Max. 880 W
Power loss with continuous power		80 W
DC bus capacitance		220 nF
24 VDC output	8B0C0320HW00.00A-1	8B0C0320HC00.00A-1
Continuous power ¹⁾		800 W
Output voltage		
DC bus voltage (U _{DC}): 260 to 315 VDC		25 VDC * (U _{DC} / 315)
DC bus voltage (U _{DC}): 315 to 800 VDC		24 VDC ±6%
Continuous current		
Normal mode (via DC bus)		32 ADC
Supply mode (via +24 Vin)		30 ADC
Reduction of continuous power depending on an ambient temperature above 40°C		No reduction
Reduction of continuous power depending on the installation elevation		
Starting at 500 m above sea level		80 W per 1000 m
Reduction of continuous power depending on the cooling method		No reduction
Startup delay		Max. 1 s
Startup time		Approx. 5 to 20 ms
Residual ripple		Typ. 50 mV _{SS}
24 VDC internal system voltage supply	8B0C0320HW00.00A-1	8B0C0320HC00.00A-1
Output voltage ²⁾		25 VDC ±1.6%
Peak current (<4 s)		
DC bus voltage (U _{DC}): 350 to 800 VDC		42 ADC
Protective measures		
Open circuit protection		Yes
Overload protection		Yes
Short circuit protection		Yes
Feedback protection		Max. 26 VDC (also when turned off)
Overtemperature protection		Yes
Dielectric strength to ground		±50 VDC
Output/Input isolation		SELV / PELV requirements
Design		ACOPOSMulti backplane
24 VDC Out	8B0C0320HW00.00A-1	8B0C0320HC00.00A-1
Output voltage ²⁾		
DC bus voltage (U _{DC}): 260 to 315 VDC		25 VDC * (U _{DC} / 315)
DC bus voltage (U _{DC}): 315 to 800 VDC		24 VDC ±6%
Protection of 24 VDC Out 1 output		30 A (slow-blow) electronic, automatic reset
Protection of 24 VDC Out 2 output		5 A (slow-blow) electronic, automatic reset
Protective measures		
Open circuit protection		Yes
Overload protection		Yes
Short circuit protection		Yes
Feedback protection		Max. 35 VDC (also when turned off)
Overtemperature protection		Yes

8B0C0320HW00.00A-1, 8B0C0320HC00.00A-1

Dielectric strength to ground		±50 VDC
Output/Input isolation		SELV / PELV requirements
Design		
24 VDC, COM		Male connector
Terminal connection cross section of 24 VDC Out 1 output		
Flexible and fine wire lines		
With wire end sleeves		0.25 to 6 mm ²
Approbation data		
UL/C-UL-US		22 to 10
CSA		22 to 10
Terminal connection cross section of 24 VDC Out 2 output		
Flexible and fine wire lines		
With wire end sleeves		0.25 to 2.5 mm ²
Approbation data		
UL/C-UL-US		22 to 12
CSA		22 to 12
24 VDC Out 1 controller input	8B0C0320HW00.00A-1	8B0C0320HC00.00A-1
Wiring		Sink
Electrical isolation		
Input - 24 VDC		Yes
Modulation compared to ground potential		Max. ±50 V
Input voltage ³⁾		
Nominal		24 VDC
Maximum		30 VDC
Switching threshold		
Low (24 VDC Out 1 is switched on)		<5 V
High (24 VDC Out 1 is switched off)		>15 V
Input current at nominal voltage		Approx. 10 mA
Switching delay		
ON (24 VDC Out 1 is switched on)		Max. 25 ms
OFF (24 VDC Out 1 is switched off) ⁴⁾		Max. 0.25 ms
Design		Male connector
Terminal connection cross sections		
Flexible and fine wire lines		
With wire end sleeves		0.25 to 2.5 mm ²
Approbation data		
UL/C-UL-US		30 to 12
CSA		22 to 12
24 VDC In	8B0C0320HW00.00A-1	8B0C0320HC00.00A-1
Input voltage ⁵⁾		
Minimum		23 VDC
Nominal		24 VDC
Maximum		26 VDC
Voltage drop between input and internal 24 VDC system voltage supply		<0.5 V
Switch-on threshold		+24 VDC internal system voltage supply <21.5 VDC
Max. continuous current		30 A
Switching delay		
When switching to supply mode		Typical 5 ms
When starting up via 24 Vin		Typ. 2 s
Status indicators		24Vi LED ERRi LED
Undervoltage detection		Yes (<20 VDC)

Auxiliary supply modules 24 V internal, 24 V external, 24 V external feed

8B0C0320HW00.00A-1, 8B0C0320HC00.00A-1

Overvoltage detection	Yes (>26 VDC)	
Protective measures		
Open circuit protection	Yes	
Overload protection	Yes, ticker operation when overload ($T_{ON} = 1 \text{ s}$, $T_{OFF} = 2.4 \text{ s}$)	
Short circuit protection	Yes	
Overtemperature protection	Yes	
Design		
24 VDC In, COM	Male connector	
Terminal connection cross section of the input "24 VDC In"		
Flexible and fine wire lines		
With wire end sleeves	0.5 to 6 mm	
Approbation data		
UL/C-UL-US	22 to 10	
CSA	22 to 10	
Operating conditions	8B0C0320HW00.00A-1	8B0C0320HC00.00A-1
Permitted mounting orientations		
Lying horizontally	Yes	
EN 60529 protection	IP20	
Mechanical characteristics	8B0C0320HW00.00A-1	8B0C0320HC00.00A-1
Dimensions ⁶⁾		
Width	53 mm	
Height	317 mm	
Depth		
Wall mounting	263 mm	-
Cold plate	-	212 mm
Feed-through mounting	-	209 mm
Weight	Approx. 3.3 kg	Approx. 2.9 kg
Module width	1	

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 55°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ When a fault occurs, the output voltage is limited to a max. of 60 VDC.

³⁾ The module's +24 Vin input is resistant to damage in a voltage range from -32 VDC to +32 VDC.

⁴⁾ The output and any connected loads are not actively discharged when switched off.

⁵⁾ The module's +24 Vin input is resistant to damage in a voltage range from -32 VDC to +32 VDC.

If a voltage outside the voltage range is applied to the +24 V In input, it is possible that this voltage is switched through directly to the 24 VDC outputs on the module without voltage limiting.

⁶⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  712.

Auxiliary supply modules 42 V internal

8B0C0160HW00.A01-1, 8B0C0160HC00.A01-1



General information	8B0C0160HW00.A01-1	8B0C0160HC00.A01-1
Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting
Certification		
CE		Yes
cULus		Yes
KC		Yes
DC bus connection	8B0C0160HW00.A01-1	8B0C0160HC00.A01-1
Continuous power consumption		Max. 880 W
Power loss with continuous power		80 W
DC bus capacitance		220 nF
24 VDC internal system voltage supply	8B0C0160HW00.A01-1	8B0C0160HC00.A01-1
Design		ACOPOSmulti backplane
42 VDC output	8B0C0160HW00.A01-1	8B0C0160HC00.A01-1
Continuous power ¹⁾		800 W
Output voltage		
DC bus voltage (U _{DC}): 260 to 315 VDC		0 V
DC bus voltage (U _{DC}): 315 to 800 VDC		42 VDC
Continuous current		16 ADC
Reduction of continuous power depending on an ambient temperature above 40°C		No reduction
Reduction of continuous power depending on the installation elevation		
Starting at 500 m above sea level		80 W per 1000 m
Reduction of continuous power depending on the cooling method		No reduction
Startup delay		Max. 1 s
Startup time		Approx. 5 to 20 ms
Residual ripple		Typ. 50 mV _{SS}
42 VDC Out	8B0C0160HW00.A01-1	8B0C0160HC00.A01-1
Output voltage		
DC bus voltage (U _{DC}): 260 to 315 VDC		0 V
DC bus voltage (U _{DC}): 315 to 800 VDC		42 VDC ±6%
Peak current (<4 s) over the total operating range of the DC bus voltage		21 ADC
Protection of 42 VDC Out 1 output		16 A (slow-blow) electronic, automatic reset
Protection of 42 VDC Out 2 output		3 A (slow-blow) electronic, automatic reset
Protective measures		
Open circuit protection		Yes
Overload protection		Yes
Short circuit protection		Yes
Feedback protection		Max. 60 VDC (also when turned off)
Overtemperature protection		Yes
Dielectric strength to ground		±96 VDC
Output/Input isolation		SELV / PELV requirements
Design		
42 VDC, COM		Male connector
Terminal connection cross section of 42 VDC Out 1 output		
Flexible and fine wire lines		
With wire end sleeves		0.25 to 6 mm ²
Approbation data		
UL/C-UL-US		22 to 10
CSA		22 to 10

Auxiliary supply modules 42 V internal

8B0C0160HW00.A01-1, 8B0C0160HC00.A01-1

Terminal connection cross section of 42 VDC Out		
2 output		
Flexible and fine wire lines		
With wire end sleeves		0.25 to 2.5 mm ²
Approbation data		
UL/C-UL-US		22 to 12
CSA		22 to 12
42 VDC Out 1 controller input	8B0C0160HW00.A01-1	8B0C0160HC00.A01-1
Wiring		Sink
Electrical isolation		
Input - 42 VDC		Yes
Modulation compared to ground potential		Max. ±50 V
Input voltage		
Nominal		24 VDC
Maximum		30 VDC
Switching threshold		
Low (42 VDC Out 1 is switched on)		<5 V
High (42 VDC Out 1 is switched off)		>15 V
Input current at nominal voltage		Approx. 10 mA
Switching delay		
ON (42 VDC Out 1 is switched on)		Max. 25 ms
OFF (42 VDC Out 1 is switched off) ²⁾		Max. 0.25 ms
Design		Male connector
Terminal connection cross sections		
Flexible and fine wire lines		
With wire end sleeves		0.25 to 2.5 mm ²
Approbation data		
UL/C-UL-US		22 to 12
CSA		22 to 12
Operating conditions	8B0C0160HW00.A01-1	8B0C0160HC00.A01-1
Permitted mounting orientations		
Lying horizontally		Yes
EN 60529 protection		IP20
Mechanical characteristics	8B0C0160HW00.A01-1	8B0C0160HC00.A01-1
Dimensions ³⁾		
Width		53 mm
Height		317 mm
Depth		
Wall mounting	263 mm	-
Cold plate	-	212 mm
Feed-through mounting	-	209 mm
Weight	Approx. 3.2 kg	Approx. 2.6 kg
Module width		1

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 55°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ The output and any connected loads are not actively discharged when switched off.

³⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  712.

1-axis inverter modules

Features

- Uncontrolled and safe stops integrated
- Integrated connection for motor holding brake and temperature sensor
- 2 slots for ACOPOSmulti plug-in modules

Technical data for all modules

General information	
Slots for plug-in modules	2
DC bus connection	
Voltage	
Nominal	750 VDC
Design	ACOPOSmulti backplane
24 VDC supply	
Input voltage	25 VDC $\pm 1.6\%$
Design	ACOPOSmulti backplane
Motor connection	
Quantity	1
Nominal switching frequency	5 kHz
Electrical stress of the connected motor in accordance with IEC TS 60034-25 ¹⁾	Limit value curve A
Protective measures	
Overload protection	Yes
Short circuit and ground fault protection	Yes
Max. output frequency	598 Hz ²⁾
Motor holding brake connection	
Quantity	1
Output voltage ³⁾	24 VDC $+5.8\%$ / -0% ⁴⁾
Extinction potential	Approx. 30 V
Max. switching frequency	0.5 Hz
Protective measures	
Overload and short circuit protection	Yes
Open line monitoring	Yes
Undervoltage monitoring	Yes
Response threshold for undervoltage monitoring	24 VDC $+0\%$ / -4%
Enable inputs	
Quantity	2
Wiring	Sink
Electrical isolation	
Input - Inverter module	Yes
Input - Input	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Input current at nominal voltage	Approx. 30 mA
Switching threshold	
Low	<5 V
High	>15 V
Switching delay at nominal input voltage	
Enable 1 -> 0, PWM off	Max. 20.5 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s
Modulation compared to ground potential	Max. ± 38 V
OSSD signal connections ⁵⁾	Permitted
	Max. test pulse length: 500 μ s

1-axis inverter modules

Trigger inputs

Quantity	2
Wiring	Sink
Electrical isolation	
Input - Inverter module	Yes
Input - Input	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Switching threshold	
Low	<5 V
High	>15 V
Input current at nominal voltage	Approx. 10 mA
Switching delay	
Rising edge	52 μ s \pm 0.5 μ s (digitally filtered)
Falling edge	53 μ s \pm 0.5 μ s (digitally filtered)
Modulation compared to ground potential	Max. \pm 38 V

Operating conditions

Permitted mounting orientations	
Hanging vertically	Yes
Lying horizontally	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ⁶⁾	4000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	III
EN 60529 protection	IP20

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum ⁷⁾	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ If necessary, the stress of the motor isolation system can be reduced by an additional externally wired dv/dt choke. For example, the RWK 305 three-phase du/dt choke from Schaffner (www.schaffner.com) can be used. Important: Even when using a dv/dt choke, it is necessary to ensure that an EMC-compatible, low inductance shield connection is used!

²⁾ The module's electrical output frequency (SCTRL_SPEED_ACT * MOTOR_POLEPAIRS) is monitored to protect against dual use in accordance with EC regulation 428/2009 | 3A225. If the electrical output frequency of the module exceeds the limit value of 598 Hz uninterrupted for more than 0.5 s, then the current movement is aborted and error 6060 is output (Power element: Limit speed exceeded).

³⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

⁴⁾ The specified value is only valid under the following conditions:

- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.

- Connection between S1 and S2 (activation of the external holding brake) using a jumper with a max. length of 10 cm.

If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.

If jumpers longer than 10 cm are used to connect S1 and S2, then the output voltage is reduced because of voltage drops on the jumpers.

⁵⁾ OSSD (open signal switching device) signals are used to monitor signal lines for short circuits and cross faults.

⁶⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

⁷⁾ Continuous operation at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

1-axis inverter modules 1.4-11 kW

Technical data



8BV10014HWS0.000-1

8BV10014HCS0.000-1

8BV10028HWS0.000-1

8BV10028HCS0.000-1

8BV10055HWS0.000-1

8BV10055HCS0.000-1

8BV10110HWS0.000-1

8BV10110HCS0.000-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	
Certification									
CE					Yes				
cULus					Yes				
KC					Yes				
FSC					Yes				

DC bus connection

Continuous power consumption ¹⁾	1.46 kW	2.87 kW	5.6 kW	11.2 kW
Power loss depending on the switching frequency ²⁾				
Switching frequency 5 kHz	[0.6 * I _M ² + 1.3 * I _M + 60] W		[0.16 * I _M ² + 5.6 * I _M + 55] W	
Switching frequency 10 kHz	[0.97 * I _M ² + 0.5 * I _M + 110] W		[0.49 * I _M ² + 4.7 * I _M + 95] W	
Switching frequency 20 kHz	[1.7 * I _M ² - 0.7 * I _M + 225] W		[0.87 * I _M ² + 10 * I _M + 200] W	
DC bus capacitance	165 µF		330 µF	

24 VDC supply

Input capacitance	23.5 µF
Max. power consumption	12 W + P _{SLOT1} + P _{SLOT2} + P _{24 V Out} + P _{HoldingBrake} + P _{Fan8B0M...} ³⁾

24 VDC output

Quantity	2
Output voltage	
DC bus voltage (U _{DC}): 260 to 315 VDC	25 VDC * (U _{DC} / 315)
DC bus voltage (U _{DC}): 315 to 800 VDC	24 VDC ±6%
Protection	250 mA (slow-blow) electronic, automatic reset

Motor connection

Quantity	1							
Continuous power per motor connection ¹⁾	1.4 kW	2.8 kW	5.5 kW	11 kW				
Continuous current per motor connection ¹⁾	1.9 A _{eff}	3.8 A _{eff}	7.6 A _{eff}	15.1 A _{eff}				
Reduction of continuous current depending on the switching frequency ⁴⁾								
Switching frequency 5 kHz	No reduction ⁵⁾	-	No reduction ⁵⁾	-	No reduction ⁵⁾	-	No reduction ⁵⁾	-
Switching frequency 10 kHz	No reduction	-	No reduction	-	0.2 A/K (from 49°C)	-	0.26 A/K (from 33°C) ⁶⁾	-
Switching frequency 20 kHz	0.11 A/K (from 33°C) ⁶⁾	-	0.12 A/K (from 33°C) ⁶⁾	-	0.13 A/K (from 4°C) ⁶⁾	-	0.15 A/K (from -28°C) ⁶⁾	-

Reduction of continuous current depending on the switching frequency and mounting method ⁷⁾

1-axis inverter modules 1.4-11 kW

Technical data

	8BV10014HWS0.000-1	8BV10014HCS0.000-1	8BV10028HWS0.000-1	8BV10028HCS0.000-1	8BV10055HWS0.000-1	8BV10055HCS0.000-1	8BV10110HWS0.000-1	8BV10110HCS0.000-1
Switching frequency 5 kHz								
Cold plate mounting ⁸⁾	-	No reduction ⁵⁾	-	No reduction ⁵⁾	-	0.65 A/K (from 57°C) ⁵⁾	-	0.73 A/K (from 55°C) ⁵⁾
Feed-through mounting	-	No reduction ⁵⁾	-	No reduction ⁵⁾	-	No reduction ⁵⁾	-	0.29 A/K (from 49°C) ⁵⁾
Switching frequency 10 kHz								
Cold plate mounting ⁸⁾	-	No reduction	-	0.6 A/K (from 58°C)	-	0.28 A/K (from 46°C)	-	0.32 A/K (from 35°C) ⁹⁾
Feed-through mounting	-	No reduction	-	No reduction	-	0.15 A/K (from 34°C) ⁶⁾	-	0.17 A/K (from 11°C) ⁶⁾
Switching frequency 20 kHz								
Cold plate mounting ⁸⁾	-	0.13 A/K (from 46°C)	-	0.1 A/K (from 34°C) ⁹⁾	-	0.14 A/K (from 5°C) ⁹⁾	-	0.18 A/K (from -13°C) ⁹⁾
Feed-through mounting	-	0.1 A/K (from 41°C)	-	0.1 A/K (from 18°C) ⁶⁾	-	0.08 A/K (from -33°C) ⁶⁾	-	0.11 A/K (from -73°C) ⁶⁾
Reduction of continuous current depending on the installation elevation								
Starting at 500 m above sea level	0.19 A _{eff} per 1000 m		0.38 A _{eff} per 1000 m		0.76 A _{eff} per 1000 m		1.51 A _{eff} per 1000 m	
Peak current	4.7 A _{eff}		9.5 A _{eff}		18.9 A _{eff}		37.7 A _{eff}	
Possible switching frequencies ¹⁰⁾	5 / 10 / 20 kHz							
Design								
U, V, W, PE	Male connector							
Shield connection	Yes							
Terminal connection cross section								
Flexible and fine wire lines								
With wire end sleeves	0.25 to 6 mm ²							
Approbation data								
UL/C-UL-US	30 to 10							
CSA	28 to 10							
Terminal cable cross section dimension of shield connection	12 to 22 mm							
Max. motor line length depending on the switching frequency								
Switching frequency 5 kHz	25 m							
Switching frequency 10 kHz	25 m							
Switching frequency 20 kHz	10 m							
Motor holding brake connection								
Quantity	1							
Output voltage ¹¹⁾	24 VDC +5.8% / -0% ¹²⁾							
Continuous current	1.1 A				2.1 A			
Max. internal resistance	0.5 Ω				0.3 Ω			
Max. extinction energy per switching operation	1.5 Ws				3 Ws			
Response threshold for open line monitoring	Approx. 0.25 A				Approx. 0.5 A			

Technical data

8BV10014HWS0.000-1

8BV10014HCS0.000-1

8BV10028HWS0.000-1

8BV10028HCS0.000-1

8BV10055HWS0.000-1

8BV10055HCS0.000-1

8BV10110HWS0.000-1

8BV10110HCS0.000-1

Operating conditions

Permitted mounting orientations

Lying horizontally	Yes
EN 60529 protection	IP20

Mechanical characteristics

Dimensions ¹³⁾

Width	53 mm							
Height	317 mm							
Depth								
Wall mounting	263 mm	-	263 mm	-	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm	-	209 mm	-	209 mm
Weight	Approx. 2.6 kg	Approx. 2.1 kg	Approx. 2.6 kg	Approx. 2.1 kg	Approx. 2.7 kg	Approx. 2.2 kg	Approx. 2.9 kg	Approx. 2.4 kg
Module width	1							

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ I_M... Current on the motor connection [A].

³⁾ P_{SLOT1} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT1 (see the technical data for the respective plug-in module).

P_{SLOT2} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).

P_{24 V Out}... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

P_{Fan8B0M...}... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

⁴⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁵⁾ Value for the nominal switching frequency.

⁶⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

⁷⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).

⁸⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

⁹⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.

¹⁰⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

¹¹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

¹²⁾ The specified value is only valid under the following conditions:

- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.

- Connection between S1 and S2 (activation of the external holding brake) using a jumper with a max. length of 10 cm.

If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.

If jumpers longer than 10 cm are used to connect S1 and S2, then the output voltage is reduced because of voltage drops on the jumpers.

¹³⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  723.

1-axis inverter modules 16-32 kW

Technical data



8BVI0220HWS0.000-1

8BVI0220HCS0.000-1

8BVI0330HWS0.000-1

8BVI0330HCS0.000-1

8BVI0440HWS0.000-1

8BVI0440HCS0.000-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification						
CE	Yes					
cULus	Yes					
KC	Yes					
FSC	Yes					

DC bus connection

Continuous power consumption ¹⁾	16.2 kW		24.4 kW		32.5 kW	
Power loss depending on the switching frequency ²⁾						
Switching frequency 5 kHz	$[0.13 * I_M^2 + 5.5 * I_M + 40]$ W		$[0.07 * I_M^2 + 7.3 * I_M + 40]$ W			
Switching frequency 10 kHz	$[0.43 * I_M^2 + 3.7 * I_M + 110]$ W		$[0.2 * I_M^2 + 11.1 * I_M + 130]$ W			
Switching frequency 20 kHz	$[1.4 * I_M^2 + 1.97 * I_M + 230]$ W		$[1.85 * I_M^2 + 3.8 * I_M + 300]$ W			
DC bus capacitance	495 µF		990 µF			

24 VDC supply

Input capacitance	32.9 µF					
Max. power consumption	$20 \text{ W} + P_{\text{SLOT1}} + P_{\text{SLOT2}} + P_{24 \text{ V Out}} + P_{\text{HoldingBrake}} + 2 * P_{\text{Fan8B0M...}}$ ³⁾		$25 \text{ W} + P_{\text{SLOT1}} + P_{\text{SLOT2}} + P_{24 \text{ V Out}} + P_{\text{HoldingBrake}} + 2 * P_{\text{Fan8B0M...}}$ ³⁾			

24 VDC output

Quantity	2					
Output voltage						
DC bus voltage (U _{DC}): 260 to 315 VDC	25 VDC * (U _{DC} / 315)					
DC bus voltage (U _{DC}): 315 to 800 VDC	24 VDC ±6%					
Protection	250 mA (slow-blow) electronic, automatic reset					

Motor connection

Quantity	1					
Continuous power per motor connection ¹⁾	16 kW		24 kW		32 kW	
Continuous current per motor connection ¹⁾	22 A _{eff}		33 A _{eff}		44 A _{eff}	
Reduction of continuous current depending on the switching frequency ⁴⁾						
Switching frequency 5 kHz	No reduction ⁵⁾	-	1.57 A/K (from 40°C) ⁵⁾	-	1.57 A/K (from 40°C) ⁵⁾	-
Switching frequency 10 kHz	0.4 A/K (from 31°C) ⁶⁾	-	0.5 A/K (from -10°C) ⁶⁾	-	0.5 A/K (from -10°C) ⁶⁾	-
Switching frequency 20 kHz	0.31 A/K (from -16°C) ⁶⁾	-	0.36 A/K (from -77°C) ⁶⁾	-	0.36 A/K (from -77°C) ⁶⁾	-

Reduction of continuous current depending on the switching frequency and mounting method ⁷⁾

Switching frequency 5 kHz						
Cold plate mounting ⁸⁾	-	No reduction ⁵⁾	-	0.8 A/K (from 45°C) ⁵⁾	-	0.8 A/K (from 45°C) ⁵⁾
Feed-through mounting	-	No reduction ⁵⁾	-	1.26 A/K (from 40°C)	-	1.26 A/K (from 40°C) ⁵⁾

Technical data

	8BVI0220HWS0.000-1	8BVI0220HCS0.000-1	8BVI0330HWS0.000-1	8BVI0330HCS0.000-1	8BVI0440HWS0.000-1	8BVI0440HCS0.000-1
Switching frequency 10 kHz						
Cold plate mounting ⁸⁾	-	0.36 A/K (from 5°C) ⁹⁾	-	0.62 A/K (from 6°C) ⁹⁾	-	0.62 A/K (from 6°C) ⁹⁾
Feed-through mounting	-	0.39 A/K (from 26°C) ⁶⁾	-	0.37 A/K (from -36°C) ⁶⁾	-	0.37 A/K (from -36°C) ⁶⁾
Switching frequency 20 kHz						
Cold plate mounting ⁸⁾	-	0.5 A/K (from 49°C)	-	0.32 A/K (from -82°C) ⁹⁾	-	0.32 A/K (from -82°C) ⁹⁾
Feed-through mounting	-	0.15 A/K (from -59°C) ⁶⁾	-	0.24 A/K (from -137°C) ⁶⁾	-	0.24 A/K (from -137°C) ⁶⁾
Reduction of continuous current depending on the installation elevation						
Starting at 500 m above sea level	2.2 A _{eff} per 1000 m		3.3 A _{eff} per 1000 m		4.4 A _{eff} per 1000 m	
Peak current	55 A _{eff}		83 A _{eff}		88 A _{eff}	
Possible switching frequencies ¹⁰⁾			5 / 10 / 20 kHz			
Design						
U, V, W, PE			Male connector			
Shield connection			Yes			
Terminal connection cross section						
Flexible and fine wire lines						
With wire end sleeves	0.5 to 6 mm ²		0.5 to 16 mm ²			
Approbation data						
UL/C-UL-US	20 to 8		20 to 6			
CSA	20 to 8		20 to 6			
Terminal cable cross section dimension of shield connection	12 to 22 mm		23 to 35 mm			
Max. motor line length depending on the switching frequency						
Switching frequency 5 kHz			25 m			
Switching frequency 10 kHz			25 m			
Switching frequency 20 kHz			25 m			
Motor holding brake connection						
Quantity			1			
Output voltage ¹¹⁾			24 VDC +5.8% / -0% ¹²⁾			
Continuous current			4.2 A			
Max. internal resistance			0.15 Ω			
Max. extinction energy per switching operation			3 Ws			
Response threshold for open line monitoring			Approx. 0.5 A			
Operating conditions						
Permitted mounting orientations						
Lying horizontally			Yes			
EN 60529 protection			IP20			

1-axis inverter modules 16-32 kW

Technical data

8BV10220HWS0.000-1

8BV10220HCS0.000-1

8BV10330HWS0.000-1

8BV10330HCS0.000-1

8BV10440HWS0.000-1

8BV10440HCS0.000-1

Mechanical characteristics

Dimensions ¹³⁾

Width	106.5 mm					
Height	317 mm					
Depth						
Wall mounting	263 mm	-	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm	-	209 mm
Weight	Approx. 5.2 kg	Approx. 3.9 kg	Approx. 5.4 kg	Approx. 4.3 kg	Approx. 5.4 kg	Approx. 4.3 kg
Module width	2					

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ I_M ... Current on the motor connection [A].

³⁾ P_{SLOT1} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT1 (see the technical data for the respective plug-in module).

P_{SLOT2} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).

$P_{24V Out}$... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

$P_{Fan8B0M}$... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

⁴⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁵⁾ Value for the nominal switching frequency.

⁶⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

⁷⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).

⁸⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

⁹⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.

¹⁰⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

¹¹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

¹²⁾ The specified value is only valid under the following conditions:

- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.

- Connection between S1 and S2 (activation of the external holding brake) using a jumper with a max. length of 10 cm.

If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.

If jumpers longer than 10 cm are used to connect S1 and S2, then the output voltage is reduced because of voltage drops on the jumpers.

¹³⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  723.

1-axis inverter modules 48-64 kW

Technical data



8BVI0660HWS0.000-1

8BVI0660HCS0.000-1

8BVI0880HWS0.004-1

8BVI0880HCS0.004-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification				
CE			Yes	
cULus			Yes	
KC			Yes	
FSC			Yes	

DC bus connection

Continuous power consumption ¹⁾	48.8 kW		65 kW
Power loss depending on the switching frequency ²⁾			
Switching frequency 5 kHz		$[0.03 * I_M^2 + 7.9 * I_M + 90]$ W	
Switching frequency 10 kHz		$[0.11 * I_M^2 + 11 * I_M + 185]$ W	
Switching frequency 20 kHz		$[0.17 * I_M^2 + 27 * I_M + 310]$ W	
DC bus capacitance		1980 μ F	

24 VDC supply

Input capacitance		32.9 μ F
Max. power consumption	$27 \text{ W} + P_{\text{SLOT1}} + P_{\text{SLOT2}} + P_{24 \text{ V Out}} + P_{\text{HoldingBrake}} + 4 * P_{\text{Fan8B0M...}}$ ³⁾	

24 VDC output

Quantity	2
Output voltage	
DC bus voltage (U_{DC}): 260 to 315 VDC	25 VDC * ($U_{\text{DC}} / 315$)
DC bus voltage (U_{DC}): 315 to 800 VDC	24 VDC \pm 6%
Protection	250 mA (slow-blow) electronic, automatic reset

Motor connection

Quantity		1	
Continuous power per motor connection ¹⁾	48 kW		64 kW
Continuous current per motor connection ¹⁾	66 A_{eff}		88 A_{eff}
Reduction of continuous current depending on the switching frequency ⁴⁾			
Switching frequency 5 kHz	1.4 A/K (from 41°C) ⁵⁾	-	1.4 A/K (from 41°C) ⁵⁾
Switching frequency 10 kHz	0.92 A/K (from -5°C) ⁶⁾	-	0.92 A/K (from -5°C) ⁶⁾
Switching frequency 20 kHz	0.56 A/K (from -90°C) ⁶⁾	-	0.56 A/K (from -90°C) ⁶⁾
Reduction of continuous current depending on the switching frequency and mounting method ⁷⁾			
Switching frequency 5 kHz			
Cold plate mounting ⁸⁾	-	1.9 A/K (from 58°C) ⁵⁾	1.9 A/K (from 58°C) ⁵⁾
Feed-through mounting	-	1.82 A/K (from 40°C) ⁵⁾	1.82 A/K (from 40°C) ⁵⁾

1-axis inverter modules 48-64 kW

Technical data

	8BV10660HWS0.000-1	8BV10660HCS0.000-1	8BV10880HWS0.004-1	8BV10880HCS0.004-1
Switching frequency 10 kHz				
Cold plate mounting ⁸⁾	-	1.36 A/K (from 27°C) ⁹⁾	-	1.36 A/K (from 27°C) ⁹⁾
Feed-through mounting	-	0.88 A/K (from -12°C) ⁶⁾	-	0.88 A/K (from -12°C) ⁶⁾
Switching frequency 20 kHz				
Cold plate mounting ⁸⁾	-	0.75 A/K (from -37°C) ⁹⁾	-	0.75 A/K (from -37°C) ⁹⁾
Feed-through mounting	-	0.54 A/K (from -106°C) ⁶⁾	-	0.54 A/K (from -106°C) ⁶⁾
Reduction of continuous current depending on the installation elevation				
Starting at 500 m above sea level	6.6 A _{eff} per 1000 m		8.8 A _{eff} per 1000 m	
Peak current	132 A _{eff}		176 A _{eff}	
Possible switching frequencies ¹⁰⁾			5 / 10 / 20 kHz	
Design				
U, V, W, PE			M8 threaded bolt	
Shield connection			Yes	
Connection cross section range				
Flexible and fine wire lines			6 to 50 mm ² ¹¹⁾	
Approbation data				
UL/C-UL-US			In preparation	
CSA			In preparation	
Terminal cable cross section dimension of shield connection			12 to 50 mm ¹²⁾	
Max. motor line length depending on the switching frequency				
Switching frequency 5 kHz			25 m	
Switching frequency 10 kHz			25 m	
Switching frequency 20 kHz			25 m	
Motor holding brake connection				
Quantity			1	
Output voltage ¹³⁾			24 VDC +5.8% / -0% ¹⁴⁾	
Continuous current			4.2 A	
Max. internal resistance			0.15 Ω	
Max. extinction energy per switching operation			3 Ws	
Response threshold for open line monitoring			Approx. 0.5 A	
Operating conditions				
Permitted mounting orientations				
Lying horizontally			Yes	
EN 60529 protection			IP20	

Technical data

8BV10660HWS0.000-1

8BV10660HCS0.000-1

8BV10880HWS0.004-1

8BV10880HCS0.004-1

Mechanical characteristics

Dimensions ¹⁵⁾

Width	213.5 mm			
Height	317 mm			
Depth				
Wall mounting	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm
Weight	Approx. 10.9 kg	Approx. 8 kg	Approx. 10.9 kg	Approx. 7.1 kg
Module width	4			

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ $I_{M...}$ Current on the motor connection [A].

³⁾ $P_{SLOT1 ...}$ Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT1 (see the technical data for the respective plug-in module).

$P_{SLOT2 ...}$ Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).

$P_{24 V Out...}$ Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

$P_{Fan8B0M...}$ Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

⁴⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁵⁾ Value for the nominal switching frequency.

⁶⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

⁷⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).

⁸⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

⁹⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.

¹⁰⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

¹¹⁾ The connection is made with cable lugs using an M8 threaded bolt. The rated cross section of the cable lug must match the wire cross section of the cable that is to be connected.

¹²⁾ The maximum diameter that can be clamped depends on the shield component set.

¹³⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

¹⁴⁾ The specified value is only valid under the following conditions:

- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.

- Connection between S1 and S2 (activation of the external holding brake) using a jumper with a max. length of 10 cm.

If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.

If jumpers longer than 10 cm are used to connect S1 and S2, then the output voltage is reduced because of voltage drops on the jumpers.

¹⁵⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  723.

1-axis inverter modules 120 kW

8BVI1650HCS0.000-1, 8BVI1650HWS0.000-1



General information	8BVI1650HCS0.000-1	8BVI1650HWS0.000-1
Cooling and mounting method	Cold plate or feed-through mounting	Wall mounting
Certification		
CE		Yes
cULus		Yes
KC		Yes
FSC	Yes	-
DC bus connection	8BVI1650HCS0.000-1	8BVI1650HWS0.000-1
Continuous power consumption ¹⁾		121.8 kW
Power loss depending on the switching frequency ²⁾		
Switching frequency 5 kHz		$[0.001 * I_M^2 + 9.9 * I_M + 165] \text{ W}$
Switching frequency 10 kHz		$[0.17 * I_M^2 + 10.8 * I_M + 320] \text{ W}$
Switching frequency 20 kHz		In preparation
DC bus capacitance		3630 μF
24 VDC supply	8BVI1650HCS0.000-1	8BVI1650HWS0.000-1
Input capacitance		32.9 μF
Max. power consumption		$37 \text{ W} + P_{\text{SLOT1}} + P_{\text{SLOT2}} + P_{24 \text{ V Out}} + P_{\text{HoldingBrake}} + 4 * P_{\text{Fan8B0M...}}^{3)}$
24 VDC output	8BVI1650HCS0.000-1	8BVI1650HWS0.000-1
Quantity		2
Output voltage		
DC bus voltage (U_{DC}): 260 to 315 VDC		25 VDC * ($U_{\text{DC}} / 315$)
DC bus voltage (U_{DC}): 315 to 800 VDC		24 VDC $\pm 6\%$
Protection		250 mA (slow-blow) electronic, automatic reset
Motor connection	8BVI1650HCS0.000-1	8BVI1650HWS0.000-1
Quantity		1
Continuous power per motor connection ¹⁾		120 kW
Continuous current per motor connection ¹⁾		165 A_{eff}
Reduction of continuous current depending on the switching frequency ⁴⁾		
Switching frequency 5 kHz	-	3.48 A/K (from 40°C) ⁵⁾
Switching frequency 10 kHz	-	1.17 A/K (from -34°C) ⁶⁾
Switching frequency 20 kHz	-	0.66 A/K (from -165°C) ⁶⁾
Reduction of continuous current depending on the switching frequency and mounting method ⁷⁾		
Switching frequency 5 kHz		
Cold plate mounting ⁸⁾	3.1 A/K (from 53°C) ⁵⁾	-
Feed-through mounting	2.82 A/K (from 40°C) ⁵⁾	-
Switching frequency 10 kHz		
Cold plate mounting ⁸⁾	1.8 A/K (from 17°C) ⁹⁾	-
Feed-through mounting	1.5 A/K (from -13°C) ⁶⁾	-
Switching frequency 20 kHz		
Cold plate mounting ⁸⁾	1.2 A/K (from -60°C) ⁹⁾	-
Feed-through mounting	0.72 A/K (from -141°C) ⁶⁾	-
Reduction of continuous current depending on the installation elevation		
Starting at 500 m above sea level		16.5 A_{eff} per 1000 m
Peak current		330 A_{eff}
Possible switching frequencies ¹⁰⁾		5 / 10 / 20 kHz
Design		
U, V, W, PE		M8 threaded bolt
Shield connection		Yes

8BVI1650HCS0.000-1, 8BVI1650HWS0.000-1

Connection cross section range		
Flexible and fine wire lines		6 to 95 mm ² ¹¹⁾
Approbation data		
UL/C-UL-US		In preparation
CSA		In preparation
Terminal cable cross section dimension of shield connection		
		12 to 50 mm ¹²⁾
Max. motor line length depending on the switching frequency		
Switching frequency 5 kHz		25 m
Switching frequency 10 kHz		25 m
Switching frequency 20 kHz		25 m
Motor holding brake connection	8BVI1650HCS0.000-1	8BVI1650HWS0.000-1
Quantity		1
Output voltage ¹³⁾		24 VDC +5.8% / -0% ¹⁴⁾
Continuous current		4.2 A
Max. internal resistance		0.15 Ω
Max. extinction energy per switching operation		3 Ws
Response threshold for open line monitoring		Approx. 0.5 A
Operating conditions	8BVI1650HCS0.000-1	8BVI1650HWS0.000-1
Permitted mounting orientations		
Lying horizontally		Yes
EN 60529 protection		IP20
Mechanical characteristics	8BVI1650HCS0.000-1	8BVI1650HWS0.000-1
Dimensions ¹⁵⁾		
Width		427.5 mm
Height		317 mm
Depth		
Wall mounting	-	263 mm
Cold plate	212 mm	-
Feed-through mounting	209 mm	-
Weight	Approx. 19.5 kg	24.7 kg
Module width		8

1-axis inverter modules 120 kW

8BVI1650HCS0.000-1, 8BVI1650HWS0.000-1

- ¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.
- ²⁾ $I_{M...}$ Current on the motor connection [A].
- ³⁾ P_{SLOT1} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT1 (see the technical data for the respective plug-in module).
 P_{SLOT2} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).
 $P_{24V Out...}$ Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).
 $P_{Fan8BOM...}$... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).
- ⁴⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.
- ⁵⁾ Value for the nominal switching frequency.
- ⁶⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
- ⁷⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).
- ⁸⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.
- ⁹⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies. Caution! Condensation can occur at low flow temperatures and return temperatures.
- ¹⁰⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.
- ¹¹⁾ The connection is made with cable lugs using an M8 threaded bolt. The rated cross section of the cable lug must match the wire cross section of the cable that is to be connected.
- ¹²⁾ The maximum diameter that can be clamped depends on the shield component set.
- ¹³⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.
- ¹⁴⁾ The specified value is only valid under the following conditions:
- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.
- Connection between S1 and S2 (activation of the external holding brake) using a jumper with a max. length of 10 cm.
If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.
If jumpers longer than 10 cm are used to connect S1 and S2, then the output voltage is reduced because of voltage drops on the jumpers.
- ¹⁵⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  723.

2-axis inverter modules

Features

- Uncontrolled and safe stops integrated
- Integrated connection for motor holding brake and temperature sensor
- 2 slots for ACOPOSMulti plug-in modules
- 2-axis modules contain two complete standalone inverters in one inverter module

Technical data for all modules

General information	
Slots for plug-in modules	2
DC bus connection	
Voltage	
Nominal	750 VDC
Design	ACOPOSMulti backplane
24 VDC supply	
Input voltage	25 VDC \pm 1.6%
Input capacitance	23.5 μ F
Design	ACOPOSMulti backplane
Motor connection	
Quantity	2
Electrical stress of the connected motor in accordance with IEC TS 60034-25 ¹⁾	Limit value curve A
Protective measures	
Overload protection	Yes
Short circuit and ground fault protection	Yes
Max. output frequency	598 Hz ²⁾
Terminal connection cross section	
Flexible and fine wire lines	
With wire end sleeves	0.25 to 6 mm ²
Approbation data	
UL/C-UL-US	30 to 10
CSA	28 to 10
Terminal cable cross section dimension of shield connection	12 to 22 mm
Motor holding brake connection	
Quantity	2
Output voltage ³⁾	24 VDC +5.8% / -0% ⁴⁾
Extinction potential	Approx. 30 V
Max. switching frequency	0.5 Hz
Protective measures	
Overload and short circuit protection	Yes
Open line monitoring	Yes
Undervoltage monitoring	Yes
Response threshold for undervoltage monitoring	24 VDC +0% / -4%

2-axis inverter modules

Enable inputs

Quantity	4 (2 per axis)
Wiring	Sink
Electrical isolation	
Input - Inverter module	Yes
Input - Input	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Input current at nominal voltage	Approx. 30 mA
Switching threshold	
Low	<5 V
High	>15 V
Switching delay at nominal input voltage	
Enable 1 -> 0, PWM off	Max. 20.5 ms
Enable 0 -> 1, ready for PWM	Max. 100 µs
Modulation compared to ground potential	Max. ±38 V
OSSD signal connections ⁵⁾	Permitted Max. test pulse length: 500 µs

Trigger inputs

Quantity	2
Wiring	Sink
Electrical isolation	
Input - Inverter module	Yes
Input - Input	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Switching threshold	
Low	<5 V
High	>15 V
Input current at nominal voltage	Approx. 10 mA
Switching delay	
Rising edge	52 µs ±0.5 µs (digitally filtered)
Falling edge	53 µs ±0.5 µs (digitally filtered)
Modulation compared to ground potential	Max. ±38 V

Operating conditions

Permitted mounting orientations	
Hanging vertically	Yes
Lying horizontally	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ⁶⁾	4000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	III
EN 60529 protection	IP20

Environmental conditions

Temperature

Operation

Nominal

5 to 40°C

Maximum ⁷⁾

55°C

Storage

-25 to 55°C

Transport

-25 to 70°C

Relative humidity

Operation

5 to 85%

Storage

5 to 95%

Transport

Max. 95% at 40°C

¹⁾ If necessary, the stress of the motor isolation system can be reduced by an additional externally wired dv/dt choke. For example, the RWK 305 three-phase du/dt choke from Schaffner (www.schaffner.com) can be used. Important: Even when using a dv/dt choke, it is necessary to ensure that an EMC-compatible, low inductance shield connection is used!

²⁾ The module's electrical output frequency (SCTRL_SPEED_ACT * MOTOR_POLEPAIRS) is monitored to protect against dual use in accordance with EC regulation 428/2009 | 3A225. If the electrical output frequency of the module exceeds the limit value of 598 Hz uninterrupted for more than 0.5 s, then the current movement is aborted and error 6060 is output (Power element: Limit speed exceeded).

³⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

⁴⁾ The specified value is only valid under the following conditions:

- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.

- Connection between S1 and S2 (activation of the external holding brake) using a jumper with a max. length of 10 cm.

If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.

If jumpers longer than 10 cm are used to connect S1 and S2, then the output voltage is reduced because of voltage drops on the jumpers.

⁵⁾ OSSD (open signal switching device) signals are used to monitor signal lines for short circuits and cross faults.

⁶⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

⁷⁾ Continuous operation at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

2-axis inverter modules 1.4-5.5 kW

Technical data



8BV10014HWD0.000-1

8BV10014HCD0.000-1

8BV10028HWD0.000-1

8BV10028HCD0.000-1

8BV10055HWD0.000-1

8BV10055HCD0.000-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification						
CE	Yes					
cULus	Yes					
KC	Yes					
FSC	Yes					

DC bus connection

Continuous power consumption ¹⁾	2.91 kW		5.73 kW		11.19 kW	
Power loss depending on the switching frequency ²⁾						
Switching frequency 5 kHz	[1.2 * I _M ² + 2.62 * I _M + 100] W					
Switching frequency 10 kHz	[2.56 * I _M ² + 2.8 * I _M + 200] W					
Switching frequency 20 kHz	[6 * I _M ² - 9.4 * I _M + 430] W					
DC bus capacitance	165 µF			330 µF		

24 VDC supply

Input capacitance	23.5 µF
Max. power consumption	16 W + P _{SLOT1} + P _{SLOT2} + P _{24 V Out} + P _{HoldingBrake(s)} + P _{Fan8BOM...} ³⁾

24 VDC output

Quantity	2
Output voltage	
DC bus voltage (U _{DC}): 260 to 315 VDC	25 VDC * (U _{DC} / 315)
DC bus voltage (U _{DC}): 315 to 800 VDC	24 VDC ±6%
Protection	250 mA (slow-blow) electronic, automatic reset

Motor connection

Quantity	2					
Continuous power per motor connection ¹⁾	1.4 kW		2.8 kW		5.5 kW	
Continuous current per motor connection ¹⁾	1.9 A _{eff}		3.8 A _{eff}		7.6 A _{eff}	
Reduction of continuous current depending on the switching frequency ⁴⁾						
Switching frequency 5 kHz	No reduction ⁵⁾	-	No reduction ⁵⁾	-	No reduction ⁵⁾	-
Switching frequency 10 kHz	No reduction	-	No reduction	-	0.22 A/K (from 43°C)	-
Switching frequency 20 kHz	0.11 A/K (from 15°C) ⁶⁾	-	0.12 A/K (from 13°C) ⁶⁾	-	0.15 A/K (from -14°C) ⁶⁾	-
Reduction of continuous current depending on the switching frequency and mounting method ⁷⁾						
Switching frequency 5 kHz						
Cold plate mounting ⁸⁾	-	No reduction ⁵⁾	-	No reduction ⁵⁾	-	0.72 A/K (from 56°C) ⁵⁾
Feed-through mounting	-	No reduction	-	No reduction ⁵⁾	-	No reduction ⁵⁾

Technical data

	8BV10014HWD0.000-1	8BV10014HCD0.000-1	8BV10028HWD0.000-1	8BV10028HCD0.000-1	8BV10055HWD0.000-1	8BV10055HCD0.000-1
Switching frequency 10 kHz						
Cold plate mounting ⁸⁾	-	No reduction	-	0.6 A/K (from 57°C)	-	0.28 A/K (from 43°C)
Feed-through mounting	-	No reduction	-	No reduction	-	0.17 A/K (from 23°C) ⁶⁾
Switching frequency 20 kHz						
Cold plate mounting ⁸⁾	-	0.13 A/K (from 45°C)	-	0.12 A/K (from 34°C) ⁹⁾	-	0.13 A/K (from 3°C) ⁹⁾
Feed-through mounting	-	0.14 A/K (from 32°C) ⁶⁾	-	0.09 A/K (from 6°C) ⁶⁾	-	0.12 A/K (from -21°C) ⁶⁾
Reduction of continuous current depending on the installation elevation						
Starting at 500 m above sea level	0.19 A _{eff} per 1000 m		0.38 A _{eff} per 1000 m		0.76 A _{eff} per 1000 m	
Peak current per motor connection	4.7 A _{eff}		9.5 A _{eff}		18.9 A _{eff}	
Possible switching frequencies ¹⁰⁾			5 / 10 / 20 kHz			
Design						
U, V, W, PE			Male connector			
Shield connection			Yes			
Terminal connection cross section						
Flexible and fine wire lines						
With wire end sleeves			0.25 to 6 mm ²			
Approbation data						
UL/C-UL-US			30 to 10			
CSA			28 to 10			
Terminal cable cross section dimension of shield connection			12 to 22 mm			
Max. motor line length depending on the switching frequency						
Switching frequency 5 kHz			25 m			
Switching frequency 10 kHz			25 m			
Switching frequency 20 kHz			10 m			
Motor holding brake connection						
Quantity			2			
Output voltage ¹¹⁾			24 VDC +5.8% / -0% ¹²⁾			
Continuous current			1.1 A			
Max. internal resistance			0.5 Ω			
Max. extinction energy per switching operation			1.5 Ws			
Response threshold for open line monitoring			Approx. 0.25 A			
Operating conditions						
Permitted mounting orientations						
Lying horizontally			Yes			
EN 60529 protection			IP20			

2-axis inverter modules 1.4-5.5 kW

Technical data

8BV10014HWD0.000-1

8BV10014HCD0.000-1

8BV10028HWD0.000-1

8BV10028HCD0.000-1

8BV10055HWD0.000-1

8BV10055HCD0.000-1

Mechanical characteristics

Dimensions ¹³⁾

Width	53 mm					
Height	317 mm					
Depth						
Wall mounting	263 mm	-	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm	-	209 mm
Weight	Approx. 2.8 kg	Approx. 2.3 kg	Approx. 2.8 kg	Approx. 2.3 kg	Approx. 2.9 kg	Approx. 2.3 kg
Module width	1					

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ I_M ... Average value of the currents on both motor connectors [A].

³⁾ P_{SLOT1} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT1 (see the technical data for the respective plug-in module).

P_{SLOT2} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).

$P_{24V Out}$... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

$P_{Fan8B0M}$... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

⁴⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁵⁾ Value for the nominal switching frequency.

⁶⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

⁷⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).

⁸⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

⁹⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.

¹⁰⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load. When using 2-axis modules, the increased CPU load reduces the functionality of the drive; if this is not taken into consideration, the computing time can be exceeded in extreme cases.

¹¹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

¹²⁾ The specified value is only valid under the following conditions:

- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.

- Connection between S1 and S2 (activation of the external holding brake) using a jumper with a max. length of 10 cm.

If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.

If jumpers longer than 10 cm are used to connect S1 and S2, then the output voltage is reduced because of voltage drops on the jumpers.

¹³⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  737.

2-axis inverter modules 11-16 kW

Technical data



8BVI0110HWD0.000-1

8BVI0110HCD0.000-1

8BVI0220HWD0.000-1

8BVI0220HCD0.000-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification				
CE			Yes	
cULus			Yes	
KC	Yes		-	Yes
FSC			Yes	

DC bus connection

Continuous power consumption ¹⁾	22.3 kW		32.37 kW
Power loss depending on the switching frequency ²⁾			
Switching frequency 5 kHz	$[0.33 * I_M^2 + 11 * I_M + 90]$ W		$[0.65 * I_M^2 - 0.35 * I_M + 64]$ W
Switching frequency 10 kHz	$[0.97 * I_M^2 + 9.5 * I_M + 170]$ W		$[2.16 * I_M^2 - 10.912 * I_M + 190]$ W
Switching frequency 20 kHz	$[1.66 * I_M^2 + 21 * I_M + 380]$ W		-
DC bus capacitance	660 µF		1320 µF

24 VDC supply

Input capacitance		23.5 µF
Max. power consumption	$20 \text{ W} + P_{\text{SLOT1}} + P_{\text{SLOT2}} + P_{24 \text{ V Out}} + P_{\text{HoldingBrake(s)}} + 2 * P_{\text{Fan8B0M...}}$ ³⁾	$21 \text{ W} + P_{\text{SLOT1}} + P_{\text{SLOT2}} + P_{24 \text{ V Out}} + P_{\text{HoldingBrake(s)}} + 2 * P_{\text{Fan8B0M...}}$ ³⁾

24 VDC output

Quantity	2
Output voltage	
DC bus voltage (U_{DC}): 260 to 315 VDC	25 VDC * ($U_{\text{DC}} / 315$)
DC bus voltage (U_{DC}): 315 to 800 VDC	24 VDC ±6%
Protection	250 mA (slow-blow) electronic, automatic reset

Motor connection

Quantity	2			
Continuous power per motor connection ¹⁾	11 kW	16 kW		
Continuous current per motor connection ¹⁾	15.1 A _{eff}	22 A _{eff}		
Reduction of continuous current depending on the switching frequency ⁴⁾				
Switching frequency 5 kHz	No reduction ⁵⁾	-	0.33 A/K (from 40°C) ⁵⁾	-
Switching frequency 10 kHz	0.19 A/K (from 29°C) ⁶⁾	-	0.17 A/K (from -25°C) ⁶⁾	-
Switching frequency 20 kHz	0.15 A/K (from -38°C) ⁶⁾		-	
Reduction of continuous current depending on the switching frequency and mounting method ⁴⁾				
Switching frequency 5 kHz				
Cold plate mounting ⁷⁾	-	0.38 A/K (from 51°C) ⁵⁾	-	0.99 A/K (from 40°C) ⁵⁾
Feed-through mounting	-	0.27 A/K (from 46°C) ⁵⁾	-	0.52 A/K (from 40°C) ⁵⁾

2-axis inverter modules 11-16 kW

Technical data

	8BVI0110HWD0.000-1	8BVI0110HCD0.000-1	8BVI0220HWD0.000-1	8BVI0220HCD0.000-1
Switching frequency 10 kHz				
Cold plate mounting ⁷⁾	-	0.25 A/K (from 24°C) ⁸⁾	-	0.29 A/K (from 10°C) ⁸⁾
Feed-through mounting	-	0.16 A/K (from 2°C) ⁶⁾	-	0.23 A/K (from 0°C) ⁶⁾
Switching frequency 20 kHz				
Cold plate mounting ⁷⁾	-	0.19 A/K (from -14°C) ⁸⁾	-	-
Feed-through mounting	-	0.14 A/K (from -74°C) ⁶⁾	-	-
Reduction of continuous current depending on the installation elevation				
Starting at 500 m above sea level	1.51 A _{eff} per 1000 m		2.2 A _{eff} per 1000 m	
Peak current per motor connection	37.7 A _{eff}		55 A _{eff} ⁹⁾	
Possible switching frequencies ¹⁰⁾	5 / 10 / 20 kHz		5 / 10 kHz	
Design				
U, V, W, PE			Male connector	
Shield connection			Yes	
Terminal connection cross section				
Flexible and fine wire lines				
With wire end sleeves			0.25 to 6 mm ²	
Approbation data				
UL/C-UL-US			30 to 10	
CSA			28 to 10	
Terminal cable cross section dimension of shield connection			12 to 22 mm	
Max. motor line length depending on the switching frequency				
Switching frequency 5 kHz			25 m	
Switching frequency 10 kHz			25 m	
Switching frequency 20 kHz	10 m		-	
Motor holding brake connection				
Quantity			2	
Output voltage ¹¹⁾			24 VDC +5.8% / -0% ¹²⁾	
Continuous current			2.1 A	
Max. internal resistance			0.3 Ω	
Max. extinction energy per switching operation			3 Ws	
Response threshold for open line monitoring			Approx. 0.5 A	
Operating conditions				
Permitted mounting orientations				
Lying horizontally			Yes	
EN 60529 protection			IP20	

Technical data

8BVI0110HWD0.000-1

8BVI0110HCD0.000-1

8BVI0220HWD0.000-1

8BVI0220HCD0.000-1

Mechanical characteristics

Dimensions ¹³⁾

Width	106.5 mm			
Height	317 mm			
Depth				
Wall mounting	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm
Weight	Approx. 5.3 kg	Approx. 4.1 kg	Approx. 5.7 kg	Approx. 4.4 kg
Module width	2			

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ I_M ... Average value of the currents on both motor connectors [A].

³⁾ P_{SLOT1} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT1 (see the technical data for the respective plug-in module).

P_{SLOT2} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).

$P_{24V Out}$... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

$P_{Fan8B0M}$... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

⁴⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min). The temperature specifications refer to the return temperature of the cold plate mounting plate.

⁵⁾ Value for the nominal switching frequency.

⁶⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

⁷⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

⁸⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.

⁹⁾ The thermal pulse load capacity is lower than for the 8BVI0220HxS0.000-1 1-axis module. It is therefore not possible to simply replace two 8BVI0220HxS0.000-1 1-axis modules with one 8BVI0220HxD0.000-1 2-axis module. If this is required, the load cycle must be examined in detail.

¹⁰⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load. When using 2-axis modules, the increased CPU load reduces the functionality of the drive; if this is not taken into consideration, the computing time can be exceeded in extreme cases.

¹¹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

¹²⁾ The specified value is only valid under the following conditions:

- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.

- Connection between S1 and S2 (activation of the external holding brake) using a jumper with a max. length of 10 cm.

If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.

If jumpers longer than 10 cm are used to connect S1 and S2, then the output voltage is reduced because of voltage drops on the jumpers.

¹³⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  737.

SafeMOTION EnDat 2.2 inverter modules (1-axis module)

Features

- Clearly structured, straightforward implementation via network-based safety technology
- Modular expandability through virtual wiring
- Immediate triggering of safety function due to short cycle times
- Easy implementation with transparent control and status information, even in the standard application
- Compact design

Technical data for all modules

General information

Slots for plug-in modules	2 ¹⁾
---------------------------	-----------------

DC bus connection

Voltage	
Nominal	750 VDC
Design	ACOPOSmulti backplane

24 VDC supply

Input voltage	25 VDC ±1.6%
Design	ACOPOSmulti backplane

Motor connection ²⁾

Quantity	1
Nominal switching frequency	5 kHz
Electrical stress of the connected motor in accordance with IEC TS 60034-25 ³⁾	Limit value curve A
Protective measures	
Overload protection	Yes
Short circuit and ground fault protection	Yes
Max. output frequency	598 Hz ⁴⁾

Motor holding brake connection

Quantity	1
Extinction potential	Approx. 30 V
Max. switching frequency	0.5 Hz
Protective measures	
Overload and short circuit protection	Yes
Open line monitoring	Yes
Undervoltage monitoring	Yes
Response threshold for undervoltage monitoring	24 VDC -2% / -4%

Encoder interfaces ⁵⁾

Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	No
Encoder monitoring	Yes
Max. encoder cable length	100 m Depends on the cross section of the encoder's supply wires ⁶⁾
Encoder supply	
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485

Trigger inputs

Quantity	2
Wiring	Sink
Electrical isolation	
Input - Inverter module	Yes
Input - Input	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Switching threshold	
Low	<5 V
High	>15 V
Input current at nominal voltage	Approx. 10 mA
Switching delay	
Rising edge	52 µs ±0.5 µs (digitally filtered)
Falling edge	53 µs ±0.5 µs (digitally filtered)
Modulation compared to ground potential	Max. ±38 V

Operating conditions

Permitted mounting orientations	
Hanging vertically	Yes
Lying horizontally	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ⁷⁾	4000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	III
EN 60529 protection	IP20 ⁸⁾

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum ⁹⁾	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ SLOT 2 is not occupied. SLOT 1 of the ACOPOSmulti module is occupied by the SafeMOTION module.

²⁾ Only 8BCM motor cables from B&R are permitted to be connected to the motor connectors.

³⁾ If necessary, the stress of the motor isolation system can be reduced by an additional externally wired dv/dt choke. For example, the RWK 305 three-phase dv/dt choke from Schaffner (www.schaffner.com) can be used. Important: Even when using a dv/dt choke, it is necessary to ensure that an EMC-compatible, low inductance shield connection is used!

⁴⁾ The module's electrical output frequency (SCTRL_SPEED_ACT * MOTOR_POLEPAIRS) is monitored to protect against dual use in accordance with EC regulation 428/2009 | 3A225. If the electrical output frequency of the module exceeds the limit value of 598 Hz uninterrupted for more than 0.5 s, then the current movement is aborted and error 6060 is output (Power element: Limit speed exceeded).

⁵⁾ Only 8BCF EnDat 2.2 cables from B&R are permitted to be connected to the encoder interfaces.

⁶⁾ The maximum encoder cable length l_{max} can be calculated as follows (the maximum permissible encoder cable length of 100 m must not be exceeded):

$$l_{max} = 7.9 / I_G * A * 1/(2 * \rho)$$

I_G ... Max. current consumption of the encoder [A].

A ... Cross section of the supply wire [mm²].

ρ ... Specific resistance [Ω mm²/m] (e.g. for copper: $\rho = 0.0178$).

⁷⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration).

⁸⁾ This value only applies in its delivered state (SLOT2 of the module is sealed by a slot cover / shield plate). If SLOT2 on the module is not sealed, then the level of protection is reduced to IP10. It is important to note that a 8SCS005.0000-00 shield set (slot cover / shield plate) or plug-in module must always be inserted!

⁹⁾ Continuous operation at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

1-axis SafeMOTION EnDat 2.2 inverter modules 1.4-11 kW

Technical data



8BVI0014HWSS.000-1

8BVI0014HCSS.000-1

8BVI0028HWSS.000-1

8BVI0028HCSS.000-1

8BVI0055HWSS.000-1

8BVI0055HCSS.000-1

8BVI0110HWSS.000-1

8BVI0110HCSS.000-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification								
CE					Yes			
cULus					Yes			
KC					Yes			
FSC					Yes			

DC bus connection

Continuous power consumption ¹⁾	1.46 kW	2.87 kW	5.6 kW	11.2 kW
Power loss depending on the switching frequency ²⁾				
Switching frequency 5 kHz	[0.6 * I _M ² + 1.3 * I _M + 60] W		[0.16 * I _M ² + 5.6 * I _M + 55] W	
Switching frequency 10 kHz	[0.97 * I _M ² + 0.5 * I _M + 110] W		[0.49 * I _M ² + 4.7 * I _M + 95] W	
Switching frequency 20 kHz	[1.7 * I _M ² - 0.7 * I _M + 225] W		[0.87 * I _M ² + 10 * I _M + 200] W	
DC bus capacitance	165 μF		330 μF	

24 VDC supply

Input capacitance	23.5 μF
Max. power consumption	18 W + P _{SMC1} + P _{SLOT2} + P _{24 V Out} + P _{HoldingBrake} + P _{Fan8B0M...} ³⁾

24 VDC output

Quantity	2
Output voltage	
DC bus voltage (U _{DC}): 260 to 315 VDC	25 VDC * (U _{DC} /315)
DC bus voltage (U _{DC}): 315 to 800 VDC	24 VDC ±6%
Protection	250 mA (slow-blow) electronic, automatic reset

Motor connection ⁴⁾

Quantity	1							
Continuous power per motor connection ¹⁾	1.4 kW	2.8 kW	5.5 kW	11 kW				
Continuous current per motor connection ¹⁾	1.9 A _{eff}	3.8 A _{eff}	7.6 A _{eff}	15.1 A _{eff}				
Reduction of continuous current depending on the switching frequency ⁵⁾								
Switching frequency 5 kHz	No reduction ⁶⁾	-	No reduction ⁶⁾	-	No reduction ⁶⁾	-	No reduction ⁶⁾	-
Switching frequency 10 kHz	No reduction	-	No reduction	-	0.2 A/K (from 49°C)	-	0.26 A/K (from 33°C) ⁷⁾	-
Switching frequency 20 kHz	0.11 A/K (from 33°C) ⁷⁾	-	0.12 A/K (from 33°C) ⁷⁾	-	0.13 A/K (from 4°C) ⁷⁾	-	0.15 A/K (from -28°C) ⁷⁾	-

Reduction of continuous current depending on the switching frequency and mounting method ⁸⁾

Technical data

	8BV10014HWSS.000-1	8BV10014HCSS.000-1	8BV10028HWSS.000-1	8BV10028HCSS.000-1	8BV10055HWSS.000-1	8BV10055HCSS.000-1	8BV10110HWSS.000-1	8BV10110HCSS.000-1
Switching frequency 5 kHz								
Cold plate mounting ⁹⁾	-	No reduction ⁶⁾	-	No reduction ⁶⁾	-	0.65 A/K (from 57°C) ⁶⁾	-	0.73 A/K (from 55°C) ⁶⁾
Feed-through mounting	-	No reduction ⁶⁾	-	No reduction ⁶⁾	-	No reduction ⁶⁾	-	0.29 A/K (from 49°C) ⁶⁾
Switching frequency 10 kHz								
Cold plate mounting ⁹⁾	-	No reduction	-	0.6 A/K (from 58°C)	-	0.28 A/K (from 46°C)	-	0.32 A/K (from 35°C) ¹⁰⁾
Feed-through mounting	-	No reduction	-	No reduction	-	0.15 A/K (from 34°C) ⁷⁾	-	0.17 A/K (from 11°C) ¹¹⁾
Switching frequency 20 kHz								
Cold plate mounting ⁹⁾	-	0.13 A/K (from 46°C)	-	0.1 A/K (from 34°C) ¹⁰⁾	-	0.14 A/K (from 5°C) ¹⁰⁾	-	0.18 A/K (from -13°C) ¹⁰⁾
Feed-through mounting	-	0.1 A/K (from 41°C)	-	0.09 A/K (from 18°C) ⁷⁾	-	0.08 A/K (from -33°C) ⁷⁾	-	0.11 A/K (from -73°C) ¹¹⁾
Reduction of continuous current depending on the installation elevation								
Starting at 500 m above sea level	0.19 A _{eff} per 1000 m		0.38 A _{eff} per 1000 m		0.76 A _{eff} per 1000 m		1.51 A _{eff} per 1000 m	
Peak current	4.7 A _{eff}		9.5 A _{eff}		18.9 A _{eff}		37.7 A _{eff}	
Possible switching frequencies ¹²⁾	5/10/20 kHz							
Design								
U, V, W, PE	Male connector							
Shield connection	Yes							
Terminal connection cross section								
Flexible and fine wire lines								
With wire end sleeves	0.25 to 4 mm ²							
Approbation data								
UL/C-UL-US	30 to 10							
CSA	28 to 10							
Terminal cable cross section dimension of shield connection	12 to 22 mm							
Max. motor line length depending on the switching frequency								
Switching frequency 5 kHz	25 m							
Switching frequency 10 kHz	25 m							
Switching frequency 20 kHz	10 m							
Motor holding brake connection								
Quantity	1							
Output voltage ¹³⁾	24 VDC +5.8% / -0% ¹⁴⁾							
Continuous current	1.1 A				2.1 A			
Max. internal resistance	0.5 Ω				0.3 Ω			
Max. extinction energy per switching operation	1.5 Ws				3 Ws			
Response threshold for open line monitoring	Approx. 0.25 A				Approx. 0.5 A			

1-axis SafeMOTION EnDat 2.2 inverter modules 1.4-11 kW

Technical data

8BVI0014HWSS.000-1

8BVI0014HCSS.000-1

8BVI0028HWSS.000-1

8BVI0028HCSS.000-1

8BVI0055HWSS.000-1

8BVI0055HCSS.000-1

8BVI0110HWSS.000-1

8BVI0110HCSS.000-1

Encoder interfaces ¹⁵⁾

Quantity	1
Type	EnDat 2.2 ¹⁶⁾
Connections	9-pin female DSUB connector
Encoder supply	
Output voltage	Typ. 12.5 V
Load capability	350 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	$P_{SMC}[W] = 19 \text{ V} * I_{Encoder}[A]$ ¹⁷⁾

Operating conditions

Permitted mounting orientations	
Lying horizontally	Yes
EN 60529 protection	IP20 ¹⁸⁾

Mechanical characteristics

Dimensions ¹⁹⁾								
Width								
Height								
Depth								
Wall mounting	263 mm	-	263 mm	-	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm	-	209 mm	-	209 mm
Weight	Approx. 2.6 kg	Approx. 2.1 kg	Approx. 2.6 kg	Approx. 2.1 kg	Approx. 2.7 kg	Approx. 2.2 kg	Approx. 2.9 kg	Approx. 2.4 kg
Module width	1							

Technical data

- ¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.
- ²⁾ $I_{M...}$ Current on the motor connection [A].
- ³⁾ $P_{SMC1 ...}$ Max. power consumption P_{SMC} [W] of the SafeMOTION module in SLOT1 (see the "Encoder interfaces" section).
 $P_{SLOT2 ...}$ Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).
 $P_{24 V Out...}$ Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).
 $P_{Fan8B0M...}$ Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).
- ⁴⁾ Only 8BCM motor cables from B&R are permitted to be connected to the motor connectors.
- ⁵⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.
- ⁶⁾ Value for the nominal switching frequency.
- ⁷⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
- ⁸⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).
- ⁹⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.
- ¹⁰⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.
- ¹¹⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
- ¹²⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.
- ¹³⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.
- ¹⁴⁾ The specified value is only valid under the following conditions:
- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.
If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.
- ¹⁵⁾ Only 8BCF EnDat 2.2 cables from B&R are permitted to be connected to the encoder interfaces.
- ¹⁶⁾ An EnDat 2.2 functional safety encoder is required when using ACOPOSmulti SafeMOTION inverter modules! With standard EnDat 2.2 encoders, only the STO, SBC and time-monitored SS1 safety functions are available!
- ¹⁷⁾ $I_{Encoder ...}$ Max. power consumption of the connected encoder [A].
- ¹⁸⁾ This value only applies in its delivered state (SLOT2 of the module is sealed by a slot cover / shield plate). If SLOT2 on the module is not sealed, then the level of protection is reduced to IP10. It is important to note that a 8SCS005.0000-00 shield set (slot cover / shield plate) or plug-in module must always be inserted!
- ¹⁹⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  746.

1-axis SafeMOTION EnDat 2.2 inverter modules 16-32 kW

Technical data



8BV10220HWSS.000-1

8BV10220HCSS.000-1

8BV10330HWSS.000-1

8BV10330HCSS.000-1

8BV10440HWSS.000-1

8BV10440HCSS.000-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification						
CE	Yes					
cULus	Yes					
KC	Yes					
FSC	Yes					

DC bus connection

Continuous power consumption ¹⁾	16.2 kW	24.4 kW	32.5 kW
Power loss depending on the switching frequency ²⁾			
Switching frequency 5 kHz	$[0.13 * I_M^2 + 5.5 * I_M + 40] \text{ W}$	$[0.07 * I_M^2 + 7.3 * I_M + 40] \text{ W}$	$[0.2 * I_M^2 + 11.1 * I_M + 130] \text{ W}$
Switching frequency 10 kHz	$[0.43 * I_M^2 + 3.7 * I_M + 110] \text{ W}$	$[1.85 * I_M^2 + 3.8 * I_M + 300] \text{ W}$	
Switching frequency 20 kHz	$[1.4 * I_M^2 + 1.97 * I_M + 230] \text{ W}$		
DC bus capacitance	495 μF	990 μF	

24 VDC supply

Input capacitance		32.9 μF
Max. power consumption	$26 \text{ W} + P_{\text{SMC1}} + P_{\text{SLOT2}} + P_{24 \text{ V Out}} + P_{\text{HoldingBrake}} + 2 * P_{\text{Fan8B0M...}}^{3)}$	$31 \text{ W} + P_{\text{SMC1}} + P_{\text{SLOT2}} + P_{24 \text{ V Out}} + P_{\text{HoldingBrake}} + 2 * P_{\text{Fan8B0M...}}^{3)}$

24 VDC output

Quantity	2
Output voltage	
DC bus voltage (U_{DC}): 260 to 315 VDC	25 VDC * ($U_{\text{DC}}/315$)
DC bus voltage (U_{DC}): 315 to 800 VDC	24 VDC $\pm 6\%$
Protection	250 mA (slow-blow) electronic, automatic reset

Motor connection ⁴⁾

Quantity	1					
Continuous power per motor connection ¹⁾	16 kW	24 kW	32 kW			
Continuous current per motor connection ¹⁾	22 A_{eff}	33 A_{eff}	44 A_{eff}			
Reduction of continuous current depending on the switching frequency ⁵⁾						
Switching frequency 5 kHz	No reduction ⁶⁾	-	1.57 A/K (from 40°C) ⁶⁾	-	1.57 A/K (from 40°C) ⁶⁾	-
Switching frequency 10 kHz	0.4 A/K (from 31°C) ⁷⁾	-	0.5 A/K (from -10°C) ⁷⁾	-	0.5 A/K (from -10°C) ⁷⁾	-
Switching frequency 20 kHz	0.31 A/K (from -16°C) ⁷⁾	-	0.36 A/K (from -77°C) ⁷⁾	-	0.36 A/K (from -77°C) ⁷⁾	-

Reduction of continuous current depending on the switching frequency and mounting method ⁸⁾

Switching frequency 5 kHz						
Cold plate mounting ⁹⁾	-	No reduction ⁶⁾	-	0.8 A/K (from 45°C) ⁶⁾	-	0.8 A/K (from 45°C) ⁶⁾
Feed-through mounting	-	No reduction ⁶⁾	-	1.26 A/K (from 40°C) ⁶⁾	-	1.26 A/K (from 40°C) ⁶⁾

Technical data

	8BV10220HWSS.000-1	8BV10220HCSS.000-1	8BV10330HWSS.000-1	8BV10330HCSS.000-1	8BV10440HWSS.000-1	8BV10440HCSS.000-1
Switching frequency 10 kHz						
Cold plate mounting ⁹⁾	-	0.36 A/K (from 5°C) ¹⁰⁾	-	0.62 A/K (from 6°C) ¹⁰⁾	-	0.62 A/K (from 6°C) ¹⁰⁾
Feed-through mounting	-	0.39 A/K (from 26°C) ⁷⁾	-	0.37 A/K (from -36°C) ⁷⁾	-	0.37 A/K (from -36°C) ⁷⁾
Switching frequency 20 kHz						
Cold plate mounting ⁹⁾	-	0.5 A/K (from 49°C)	-	0.32 A/K (from -82°C) ¹⁰⁾	-	0.32 A/K (from -82°C) ¹⁰⁾
Feed-through mounting	-	0.15 A/K (from -59°C) ⁷⁾	-	0.24 A/K (from -137°C) ⁷⁾	-	0.24 A/K (from -137°C) ⁷⁾
Reduction of continuous current depending on the installation elevation						
Starting at 500 m above sea level	2.2 A _{eff} per 1000 m		3.3 A _{eff} per 1000 m		4.4 A _{eff} per 1000 m	
Peak current	55 A _{eff}		83 A _{eff}		88 A _{eff}	
Possible switching frequencies ¹¹⁾	5/10/20 kHz					
Design						
U, V, W, PE	Male connector					
Shield connection	Yes					
Terminal connection cross section						
Flexible and fine wire lines						
With wire end sleeves	0.5 to 6 mm ²			0.5 to 16 mm ²		
Approbation data						
UL/C-UL-US	20 to 8			20 to 6		
CSA	20 to 8			20 to 6		
Terminal cable cross section dimension of shield connection	12 to 22 mm			23 to 35 mm		
Max. motor line length depending on the switching frequency						
Switching frequency 5 kHz	25 m					
Switching frequency 10 kHz	25 m					
Switching frequency 20 kHz	25 m					
Motor holding brake connection						
Quantity	1					
Output voltage ¹²⁾	24 VDC +5.8% / -0.5% ¹³⁾					
Continuous current	4.2 A					
Max. internal resistance	0.15 Ω					
Max. extinction energy per switching operation	3 Ws					
Response threshold for open line monitoring	Approx. 0.5 A					
Encoder interfaces ¹⁴⁾						
Quantity	1					
Type	EnDat 2.2 ¹⁵⁾					
Connections	9-pin female DSUB connector					
Encoder supply						
Output voltage	Typ. 12.5 V					
Load capability	350 mA					

1-axis SafeMOTION EnDat 2.2 inverter modules 16-32 kW

Technical data

	8BV10220HWSS.000-1	8BV10220HCSS.000-1	8BV10330HWSS.000-1	8BV10330HCSS.000-1	8BV10440HWSS.000-1	8BV10440HCSS.000-1
Protective measures						
Short circuit protection	Yes					
Overload protection	Yes					
Synchronous serial interface						
Signal transmission	RS485					
Data transfer rate	6.25 Mbit/s					
Max. power consumption per encoder interface	$P_{SMCL} [W] = 19 V * I_{Encoder} [A]$ ¹⁶⁾					
Operating conditions						
Permitted mounting orientations						
Lying horizontally	Yes					
EN 60529 protection	IP20 ¹⁷⁾					
Mechanical characteristics						
Dimensions ¹⁸⁾						
Width	106.5 mm					
Height	317 mm					
Depth						
Wall mounting	263 mm	-	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm	-	209 mm
Weight	Approx. 5.2 kg	Approx. 3.9 kg	Approx. 5.4 kg	Approx. 4.3 kg	Approx. 5.4 kg	Approx. 4.3 kg
Module width	2					

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ I_M ... Current on the motor connection [A].

³⁾ P_{SMC1} ... Max. power consumption P_{SMC} [W] of the SafeMOTION module in SLOT1 (see the "Encoder interfaces" section).

P_{SLOT2} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).

$P_{24V Out}$... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

$P_{Fan8B0M}$... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

⁴⁾ Only 8BCM motor cables from B&R are permitted to be connected to the motor connectors.

⁵⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁶⁾ Value for the nominal switching frequency.

⁷⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

⁸⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).

⁹⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

Technical data

- ¹⁰⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.
- ¹¹⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.
- ¹²⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.
- ¹³⁾ The specified value is only valid under the following conditions:
- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.
If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.
- ¹⁴⁾ Only 8BCF EnDat 2.2 cables from B&R are permitted to be connected to the encoder interfaces.
- ¹⁵⁾ An EnDat 2.2 functional safety encoder is required when using ACOPOSmulti SafeMOTION inverter modules! With standard EnDat 2.2 encoders, only the STO, SBC and time-monitored SS1 safety functions are available!
- ¹⁶⁾ I_{Encoder} ... Max. power consumption of the connected encoder [A].
- ¹⁷⁾ This value only applies in its delivered state (SLOT2 of the module is sealed by a slot cover / shield plate). If SLOT2 on the module is not sealed, then the level of protection is reduced to IP10. It is important to note that a 8SCS005.0000-00 shield set (slot cover / shield plate) or plug-in module must always be inserted!
- ¹⁸⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  746.

1-axis SafeMOTION EnDat 2.2 inverter modules 48-64 kW

Technical data



8BV10660HWSS.000-1

8BV10660HCSS.000-1

8BV10880HWSS.004-1

8BV10880HCSS.004-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification				
CE			Yes	
cULus			Yes	
KC			Yes	
FSC			Yes	

DC bus connection

Continuous power consumption ¹⁾	48.8 kW		65 kW	
Power loss depending on the switching frequency ²⁾				
Switching frequency 5 kHz		[0.03 * I _M ² + 7.9 * I _M + 90] W		
Switching frequency 10 kHz		[0.11 * I _M ² + 11 * I _M + 185] W		
Switching frequency 20 kHz		[0.17 * I _M ² + 27 * I _M + 310] W		
DC bus capacitance		1980 µF		

24 VDC supply

Input capacitance		32.9 µF		
Max. power consumption		33 W + P _{SMC1} + P _{SLOT2} + P _{24 V Out} + P _{HoldingBrake} + 4 * P _{Fan8B0M...} ³⁾		

24 VDC output

Quantity		2		
Output voltage				
DC bus voltage (U _{DC}): 260 to 315 VDC		25 VDC * (U _{DC} /315)		
DC bus voltage (U _{DC}): 315 to 800 VDC		24 VDC ±6%		
Protection		250 mA (slow-blow) electronic, automatic reset		

Motor connection ⁴⁾

Quantity		1		
Continuous power per motor connection ¹⁾	48 kW		64 kW	
Continuous current per motor connection ¹⁾	66 A _{eff}		88 A _{eff}	
Reduction of continuous current depending on the switching frequency ⁵⁾				
Switching frequency 5 kHz	1.4 A/K (from 41°C) ⁶⁾	-	1.4 A/K (from 41°C) ⁶⁾	-
Switching frequency 10 kHz	0.92 A/K (from -5°C) ⁷⁾	-	0.92 A/K (from -5°C) ⁷⁾	-
Switching frequency 20 kHz	0.56 A/K (from -90°C) ⁷⁾	-	0.56 A/K (from -90°C) ⁷⁾	-
Reduction of continuous current depending on the switching frequency and mounting method ⁸⁾				
Switching frequency 5 kHz				
Cold plate mounting ⁹⁾	-	1.9 A/K (from 58°C) ⁶⁾	-	1.9 A/K (from 58°C) ⁶⁾
Feed-through mounting	-	1.82 A/K (from 40°C) ⁶⁾	-	1.82 A/K (from 40°C) ⁶⁾

Technical data

	8BV10660HWSS.000-1	8BV10660HCSS.000-1	8BV10880HWSS.004-1	8BV10880HCSS.004-1
Switching frequency 10 kHz				
Cold plate mounting ⁹⁾	-	1.36 A/K (from 27°C) ¹⁰⁾	-	1.36 A/K (from 27°C) ¹⁰⁾
Feed-through mounting	-	0.88 A/K (from -12°C) ⁷⁾	-	0.88 A/K (from -12°C) ⁷⁾
Switching frequency 20 kHz				
Cold plate mounting ⁹⁾	-	0.75 A/K (from -37°C) ¹⁰⁾	-	0.75 A/K (from -37°C) ¹⁰⁾
Feed-through mounting	-	0.54 A/K (from -106°C) ⁷⁾	-	0.54 A/K (from 106°C) ⁷⁾
Reduction of continuous current depending on the installation elevation				
Starting at 500 m above sea level	6.6 A _{eff} per 1000 m		8.8 A _{eff} per 1000 m	
Peak current	132 A _{eff}		176 A _{eff}	
Possible switching frequencies ¹¹⁾	5/10/20 kHz			
Design				
U, V, W, PE	M8 threaded bolt			
Shield connection	Yes			
Connection cross section range				
Flexible and fine wire lines	6 to 50 mm ² ¹²⁾			
Approbation data				
UL/C-UL-US	In preparation			
CSA	In preparation			
Terminal cable cross section dimension of shield connection	12 to 50 mm ¹³⁾			
Max. motor line length depending on the switching frequency				
Switching frequency 5 kHz	25 m			
Switching frequency 10 kHz	25 m			
Switching frequency 20 kHz	25 m			
Motor holding brake connection				
Quantity	1			
Output voltage ¹⁴⁾	24 VDC +5.8% / -0.5% ¹⁵⁾			
Continuous current	4.2 A			
Max. internal resistance	0.15 Ω			
Max. extinction energy per switching operation	3 Ws			
Response threshold for open line monitoring	Approx. 0.5 A			
Encoder interfaces ¹⁶⁾				
Quantity	1			
Type	EnDat 2.2 ¹⁷⁾			
Connections	9-pin female DSUB connector			
Encoder supply				
Output voltage	Typ. 12.5 V			
Load capability	350 mA			
Protective measures				
Short circuit protection	Yes			
Overload protection	Yes			

1-axis SafeMOTION EnDat 2.2 inverter modules 48-64 kW

Technical data

	8BV10660HWSS.000-1	8BV10660HCSS.000-1	8BV10880HWSS.004-1	8BV10880HCSS.004-1
Synchronous serial interface				
Signal transmission	RS485			
Data transfer rate	6.25 Mbit/s			
Max. power consumption per encoder interface	$P_{SMC}[W] = 19 V * I_{Encoder}[A]$ ¹⁸⁾			
Operating conditions				
Permitted mounting orientations				
Lying horizontally	Yes			
EN 60529 protection	IP20 ¹⁹⁾			
Mechanical characteristics				
Dimensions ²⁰⁾				
Width	213.5 mm			
Height	317 mm			
Depth				
Wall mounting	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm
Weight	Approx. 10.9 kg	Approx. 8 kg	Approx. 10.9 kg	Approx. 8 kg
Module width	4			

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ I_M ... Current on the motor connection [A].

³⁾ P_{SMC1} ... Max. power consumption P_{SMC} [W] of the SafeMOTION module in SLOT1 (see the "Encoder interfaces" section).

P_{SLOT2} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).

$P_{24V Out}$... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

$P_{Fan8B0M}$... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

⁴⁾ Only 8BCM motor cables from B&R are permitted to be connected to the motor connectors.

⁵⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁶⁾ Value for the nominal switching frequency.

⁷⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

⁸⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).

⁹⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

¹⁰⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.

¹¹⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

Technical data

- ¹²⁾ The connection is made with cable lugs using an M8 threaded bolt. The rated cross section of the cable lug must match the wire cross section of the cable that is to be connected.
- ¹³⁾ The maximum diameter that can be clamped depends on the shield component set.
- ¹⁴⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.
- ¹⁵⁾ The specified value is only valid under the following conditions:
- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.
 - Connection between S1 and S2 (activation of the external holding brake) using a jumper with a max. length of 10 cm.
- If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.
- If jumpers longer than 10 cm are used to connect S1 and S2, then the output voltage is reduced because of voltage drops on the jumpers.
- ¹⁶⁾ Only 8BCF EnDat 2.2 cables from B&R are permitted to be connected to the encoder interfaces.
- ¹⁷⁾ An EnDat 2.2 functional safety encoder is required when using ACOPOSmulti SafeMOTION inverter modules! With standard EnDat 2.2 encoders, only the STO, SBC and time-monitored SS1 safety functions are available!
- ¹⁸⁾ I_{Encoder} ... Max. power consumption of the connected encoder [A].
- ¹⁹⁾ This value only applies in its delivered state (SLOT2 of the module is sealed by a slot cover / shield plate). If SLOT2 on the module is not sealed, then the level of protection is reduced to IP10. It is important to note that a 8SCS005.0000-00 shield set (slot cover / shield plate) or plug-in module must always be inserted!
- ²⁰⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  746.

1-axis SafeMOTION EnDat 2.2 inverter modules 120 kW

8BVI1650HWSS.000-1, 8BVI1650HCSS.000-1



General information	8BVI1650HWSS.000-1	8BVI1650HCSS.000-1
Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting
Certification		
CE		Yes
cULus		Yes
KC	-	Yes
FSC		Yes
DC bus connection	8BVI1650HWSS.000-1	8BVI1650HCSS.000-1
Continuous power consumption ¹⁾		121.8 kW
Power loss depending on the switching frequency ²⁾		
Switching frequency 5 kHz		$[0.001 * I_M^2 + 9.9 * I_M + 165] \text{ W}$
Switching frequency 10 kHz		$[0.17 * I_M^2 + 10.8 * I_M + 320] \text{ W}$
Switching frequency 20 kHz		In preparation
DC bus capacitance		3630 μF
24 VDC supply	8BVI1650HWSS.000-1	8BVI1650HCSS.000-1
Input capacitance		32.9 μF
Max. power consumption		$43 \text{ W} + P_{\text{SMC1}} + P_{\text{SLOT2}} + P_{24 \text{ V Out}} + P_{\text{HoldingBrake}} + 4 * P_{\text{Fan8B0M...}}^{3)}$
24 VDC output	8BVI1650HWSS.000-1	8BVI1650HCSS.000-1
Quantity		2
Output voltage		
DC bus voltage (U_{DC}): 260 to 315 VDC		$25 \text{ VDC} * (U_{\text{DC}}/315)$
DC bus voltage (U_{DC}): 315 to 800 VDC		24 VDC $\pm 6\%$
Protection		250 mA (slow-blow) electronic, automatic reset
Motor connection ⁴⁾	8BVI1650HWSS.000-1	8BVI1650HCSS.000-1
Quantity		1
Continuous power per motor connection ¹⁾		120 kW
Continuous current per motor connection ¹⁾		165 A_{eff}
Reduction of continuous current depending on the switching frequency ⁵⁾		
Switching frequency 5 kHz	3.48 A/K (from 40°C) ⁶⁾	-
Switching frequency 10 kHz	1.17 A/K (from -35°C) ⁷⁾	-
Switching frequency 20 kHz	0.66 A/K (from -165°C) ⁷⁾	-
Reduction of continuous current depending on the switching frequency and mounting method ⁸⁾		
Switching frequency 5 kHz		
Cold plate mounting ⁹⁾	-	3.1 A/K (from 53°C) ⁶⁾
Feed-through mounting	-	2.82 A/K (from 40°C) ⁶⁾
Switching frequency 10 kHz		
Cold plate mounting ⁹⁾	-	1.8 A/K (from 17°C) ¹⁰⁾
Feed-through mounting	-	1.5 A/K (from -13°C) ⁷⁾
Switching frequency 20 kHz		
Cold plate mounting ⁹⁾	-	1.2 A/K (from -60°C) ¹⁰⁾
Feed-through mounting	-	0.72 A/K (from 141°C) ⁷⁾
Reduction of continuous current depending on the installation elevation		
Starting at 500 m above sea level		16.5 A_{eff} per 1000 m
Peak current		330 A_{eff}
Possible switching frequencies ¹¹⁾		5/10/20 kHz
Design		
U, V, W, PE		M8 threaded bolt

8BVI1650HWSS.000-1, 8BVI1650HCSS.000-1

Shield connection		Yes
Connection cross section range		
Flexible and fine wire lines		6 to 95 mm ² ¹²⁾
Approbation data		
UL/C-UL-US		In preparation
CSA		In preparation
Terminal cable cross section dimension of shield connection		12 to 50 mm ¹³⁾
Max. motor line length depending on the switching frequency		
Switching frequency 5 kHz		25 m
Switching frequency 10 kHz		25 m
Switching frequency 20 kHz		25 m
Motor holding brake connection	8BVI1650HWSS.000-1	8BVI1650HCSS.000-1
Quantity		1
Output voltage ¹⁴⁾		24 VDC +5.8% / -0.5% ¹⁵⁾
Continuous current		4.2 A
Max. internal resistance		0.15 Ω
Max. extinction energy per switching operation		3 Ws
Response threshold for open line monitoring		Approx. 0.5 A
Encoder interfaces ¹⁶⁾	8BVI1650HWSS.000-1	8BVI1650HCSS.000-1
Quantity		1
Type		EnDat 2.2 ¹⁷⁾
Connections		9-pin female DSUB connector
Encoder supply		
Output voltage		Typ. 12.5 V
Load capability		350 mA
Protective measures		
Short circuit protection		Yes
Overload protection		Yes
Synchronous serial interface		
Signal transmission		RS485
Data transfer rate		6.25 Mbit/s
Max. power consumption per encoder interface		$P_{SMCL}[W] = 19 V * I_{Encoder}[A]$ ¹⁸⁾
Operating conditions	8BVI1650HWSS.000-1	8BVI1650HCSS.000-1
Permitted mounting orientations		
Lying horizontally		Yes
EN 60529 protection		IP20 ¹⁹⁾
Mechanical characteristics	8BVI1650HWSS.000-1	8BVI1650HCSS.000-1
Dimensions ²⁰⁾		
Width		427.5 mm
Height	-	317 mm
Depth		
Wall mounting	263 mm	-
Cold plate	-	212 mm
Feed-through mounting	-	209 mm
Weight	24.8 kg	Approx. 19.5 kg
Module width		8

1-axis SafeMOTION EnDat 2.2 inverter modules 120 kW

8BVI1650HWSS.000-1, 8BVI1650HCSS.000-1

- ¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.
- ²⁾ $I_{M...}$ Current on the motor connection [A].
- ³⁾ $P_{SMC1} ...$ Max. power consumption P_{SMC} [W] of the SafeMOTION module in SLOT1 (see the "Encoder interfaces" section).
 $P_{SLOT2} ...$ Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).
 $P_{24V Out...}$ Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).
 $P_{Fan8BOM...}$ Portion of the power [W] that is used by the fan modules in the mounting plate or the 8BOM0040HFF0.000-1 fan module (see the technical data for the respective 8BOM... mounting plate / 8BOM0040HFF0.000-1 fan module).
- ⁴⁾ Only 8BCM motor cables from B&R are permitted to be connected to the motor connectors.
- ⁵⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.
- ⁶⁾ Value for the nominal switching frequency.
- ⁷⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
- ⁸⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).
- ⁹⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.
- ¹⁰⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies. Caution! Condensation can occur at low flow temperatures and return temperatures.
- ¹¹⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.
- ¹²⁾ The connection is made with cable lugs using an M8 threaded bolt. The rated cross section of the cable lug must match the wire cross section of the cable that is to be connected.
- ¹³⁾ The maximum diameter that can be clamped depends on the shield component set.
- ¹⁴⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.
- ¹⁵⁾ The specified value is only valid under the following conditions:
 - The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.
 - Connection between S1 and S2 (activation of the external holding brake) using a jumper with a max. length of 10 cm.If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.
If jumpers longer than 10 cm are used to connect S1 and S2, then the output voltage is reduced because of voltage drops on the jumpers.
- ¹⁶⁾ Only 8BCF EnDat 2.2 cables from B&R are permitted to be connected to the encoder interfaces.
- ¹⁷⁾ An EnDat 2.2 functional safety encoder is required when using ACOPOSmulti SafeMOTION inverter modules! With standard EnDat 2.2 encoders, only the STO, SBC and time-monitored SS1 safety functions are available!
- ¹⁸⁾ $I_{Encoder} ...$ Max. power consumption of the connected encoder [A].
- ¹⁹⁾ This value only applies in its delivered state (SLOT2 of the module is sealed by a slot cover / shield plate). If SLOT2 on the module is not sealed, then the level of protection is reduced to IP10. It is important to note that a 8SCS005.0000-00 shield set (slot cover / shield plate) or plug-in module must always be inserted!
- ²⁰⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  746.

Inverter module SafeMOTION EnDat 2.2 (2-axis module)

Features

- Clearly structured, straightforward implementation via network-based safety technology
- Modular expandability through virtual wiring
- Immediate triggering of safety function due to short cycle times
- Easy implementation with transparent control and status information, even in the standard application
- Compact design
- Complete safety functionality, even in 2-axis modules

Technical data for all modules

General information		
Slots for plug-in modules	2 ¹⁾	
DC bus connection		
Voltage	750 VDC	
Nominal	750 VDC	
Design	ACOPOSmulti backplane	
24 VDC supply		
Input voltage	25 VDC ±1.6%	
Input capacitance	23.5 µF	
Design	ACOPOSmulti backplane	
Motor connection ²⁾		
Quantity	2	
Nominal switching frequency	5 kHz	
Electrical stress of the connected motor in accordance with IEC TS 60034-25 ³⁾	Limit value curve A	
Protective measures		
Overload protection	Yes	
Short circuit and ground fault protection	Yes	
Max. output frequency	598 Hz ⁴⁾	
Terminal connection cross section		
Flexible and fine wire lines		
With wire end sleeves	0.25 to 4 mm ²	
Approbation data		
UL/C-UL-US	30 to 10	
CSA	28 to 10	
Motor holding brake connection		
Quantity	2	
Output voltage ⁵⁾	24 VDC +5.8% / -0% ⁶⁾	24 VDC +5.8% / -0.5% ⁶⁾
Extinction potential	Approx. 30 V	
Max. switching frequency	0.5 Hz	
Protective measures		
Overload and short circuit protection	Yes	
Open line monitoring	Yes	
Undervoltage monitoring	Yes	
Response threshold for undervoltage monitoring	24 VDC -2% / -4%	

Inverter module SafeMOTION EnDat 2.2 (2-axis module)

Encoder interfaces ⁷⁾

Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	No
Encoder monitoring	Yes
Max. encoder cable length	100 m Depends on the cross section of the encoder's supply wires ⁸⁾
Encoder supply	
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485

Trigger inputs

Quantity	2
Wiring	Sink
Electrical isolation	
Input - Inverter module	Yes
Input - Input	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Switching threshold	
Low	<5 V
High	>15 V
Switching delay	
Rising edge	52 μ s \pm 0.5 μ s (digitally filtered)
Falling edge	53 μ s \pm 0.5 μ s (digitally filtered)
Modulation compared to ground potential	Max. \pm 38 V

Operating conditions

Permitted mounting orientations	
Hanging vertically	Yes
Lying horizontally	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ⁹⁾	4000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	III
EN 60529 protection	IP20

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum ¹⁰⁾	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

- ¹⁾ SLOT 1 and SLOT 2 of the ACOPOSmulti module are occupied by the encoder interfaces.
- ²⁾ Only 8BCM motor cables from B&R are permitted to be connected to the motor connectors.
- ³⁾ If necessary, the stress of the motor isolation system can be reduced by an additional externally wired dv/dt choke. For example, the RWK 305 three-phase du/dt choke from Schaffner (www.schaffner.com) can be used.
Important: Even when using a dv/dt choke, it is necessary to ensure that an EMC-compatible, low inductance shield connection is used!
- ⁴⁾ The module's electrical output frequency (SCTRL_SPEED_ACT * MOTOR_POLEPAIRS) is monitored to protect against dual use in accordance with EC regulation 428/2009 | 3A225. If the electrical output frequency of the module exceeds the limit value of 598 Hz uninterrupted for more than 0.5 s, then the current movement is aborted and error 6060 is output (Power element: Limit speed exceeded).
- ⁵⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.
- ⁶⁾ The specified value is only valid under the following conditions:
- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.
If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.
- ⁷⁾ Only 8BCF EnDat 2.2 cables from B&R are permitted to be connected to the encoder interfaces.
- ⁸⁾ The maximum encoder cable length l_{max} can be calculated as follows (the maximum permissible encoder cable length of 100 m must not be exceeded):

$$l_{max} = 7.9 / I_G * A * 1/(2 * \rho)$$

I_G ... Max. current consumption of the encoder [A].

A ... Cross section of the supply wire [mm²].

ρ ... Specific resistance [Ω mm²/m] (e.g. for copper: $\rho = 0.0178$).

- ⁹⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration).
- ¹⁰⁾ Continuous operation at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

2-axis SafeMOTION EnDat 2.2 inverter modules 1.4-5.5 kW

Technical data



8BV10014HWDS.000-1

8BV10014HCDS.000-1

8BV10028HWDS.000-1

8BV10028HCDS.000-1

8BV10055HWDS.000-1

8BV10055HCDS.000-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification						
CE	Yes					
cULus	Yes					
KC	Yes					
FSC	Yes					

DC bus connection

Continuous power consumption ¹⁾	2.91 kW		5.73 kW		11.19 kW	
Power loss depending on the switching frequency ²⁾						
Switching frequency 5 kHz	[1.2 * I _M ² + 2.62 * I _M + 100] W					
Switching frequency 10 kHz	[2.56 * I _M ² + 2.8 * I _M + 200] W					
Switching frequency 20 kHz	[6 * I _M ² - 9.4 * I _M + 430] W					
DC bus capacitance	165 µF			330 µF		

24 VDC supply

Input capacitance	23.5 µF					
Max. power consumption	28 W + P _{SMC1} + P _{SMC2} + P _{24 V Out} + P _{HoldingBrake(s)} + P _{Fan8B0M...} ³⁾					

24 VDC output

Quantity	2					
Output voltage						
DC bus voltage (U _{DC}): 260 to 315 VDC	25 VDC * (U _{DC} /315)					
DC bus voltage (U _{DC}): 315 to 800 VDC	24 VDC ±6%					
Protection	250 mA (slow-blow) electronic, automatic reset					

Motor connection ⁴⁾

Quantity	2					
Continuous power per motor connection ¹⁾	1.4 kW		2.8 kW		5.5 kW	
Continuous current per motor connection ¹⁾	1.9 A _{eff}		3.8 A _{eff}		7.6 A _{eff}	
Reduction of continuous current depending on the switching frequency ⁵⁾						
Switching frequency 5 kHz	No reduction ⁶⁾	-	No reduction ⁶⁾	-	No reduction ⁶⁾	-
Switching frequency 10 kHz	No reduction	-	No reduction	-	0.22 A/K (from 43°C)	-
Switching frequency 20 kHz	0.11 A/K (from 15°C) ⁷⁾	-	0.12 A/K (from 13°C) ⁷⁾	-	0.15 A/K (from -14°C) ⁷⁾	-

Reduction of continuous current depending on the switching frequency and mounting method ⁸⁾

Switching frequency 5 kHz						
Cold plate mounting ⁹⁾	-	No reduction ⁶⁾	-	No reduction ⁶⁾	-	0.72 A/K (from 56°C) ⁶⁾
Feed-through mounting	-	No reduction ⁶⁾	-	No reduction ⁶⁾	-	No reduction ⁶⁾

Technical data

	8BV10014HWDS.000-1	8BV10014HCDS.000-1	8BV10028HWDS.000-1	8BV10028HCDS.000-1	8BV10055HWDS.000-1	8BV10055HCDS.000-1
Switching frequency 10 kHz						
Cold plate mounting ⁹⁾	-	No reduction	-	0.6 A/K (from 57°C)	-	0.28 A/K (from 43°C)
Feed-through mounting	-	No reduction	-	No reduction	-	0.17 A/K (from 23°C) ⁷⁾
Switching frequency 20 kHz						
Cold plate mounting ⁹⁾	-	0.13 A/K (from 45°C)	-	0.12 A/K (from 34°C) ¹⁰⁾	-	0.13 A/K (from 3°C) ¹⁰⁾
Feed-through mounting	-	0.14 A/K (from 32°C) ⁷⁾	-	0.09 A/K (from 6°C) ⁷⁾	-	0.12 A/K (from -21°C) ⁷⁾
Reduction of continuous current depending on the installation elevation						
Starting at 500 m above sea level	0.19 A _{eff} per 1000 m		0.38 A _{eff} per 1000 m		0.76 A _{eff} per 1000 m	
Peak current per motor connection	4.7 A _{eff}		9.5 A _{eff}		18.9 A _{eff}	
Possible switching frequencies ¹¹⁾			5/10/20 kHz			
Design						
U, V, W, PE			Male connector			
Shield connection			Yes			
Terminal connection cross section						
Flexible and fine wire lines						
With wire end sleeves			0.25 to 4 mm ²			
Approbation data						
UL/C-UL-US			30 to 10			
CSA			28 to 10			
Terminal cable cross section dimension of shield connection			12 to 22 mm			
Max. motor line length depending on the switching frequency						
Switching frequency 5 kHz			25 m			
Switching frequency 10 kHz			25 m			
Switching frequency 20 kHz			10 m			
Motor holding brake connection						
Quantity			2			
Output voltage ¹²⁾			24 VDC +5.8% / -0% ¹³⁾			
Continuous current			1.1 A			
Max. internal resistance			0.5 Ω			
Max. extinction energy per switching operation			1.5 Ws			
Response threshold for open line monitoring			Approx. 0.25 A			
Encoder interfaces ¹⁴⁾						
Quantity			2			
Type			EnDat 2.2 ¹⁵⁾			
Connections			9-pin female DSUB connector			
Encoder supply						
Output voltage			Typ. 12.5 V			
Load capability			350 mA			
Protective measures						
Short circuit protection			Yes			
Overload protection			Yes			

2-axis SafeMOTION EnDat 2.2 inverter modules 1.4-5.5 kW

Technical data

	8BYI0014HWDS.000-1	8BYI0014HCDS.000-1	8BYI0028HWDS.000-1	8BYI0028HCDS.000-1	8BYI0055HWDS.000-1	8BYI0055HCDS.000-1
Synchronous serial interface						
Signal transmission	RS485					
Data transfer rate	6.25 Mbit/s					
Max. power consumption per encoder interface	$P_{SMC}[W] = 19 V * I_{Encoder}[A]$ ¹⁶⁾					
Operating conditions						
Permitted mounting orientations						
Lying horizontally	Yes					
EN 60529 protection	IP20					
Mechanical characteristics						
Dimensions ¹⁷⁾						
Width	53 mm					
Height	317 mm					
Depth						
Wall mounting	263 mm	-	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm	-	209 mm
Weight	Approx. 2.8 kg	Approx. 2.3 kg	Approx. 2.8 kg	Approx. 2.3 kg	Approx. 2.9 kg	Approx. 2.3 kg
Module width	1					

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ I_M ... Average value of the currents on both motor connectors [A].

³⁾ P_{SMC1} ... Max. power consumption P_{SMC} [W] of the SafeMOTION module in SLOT1 (see the "Encoder interfaces" section).

P_{SMC2} ... Max. power consumption P_{SMC} [W] of the SafeMOTION module in SLOT2 (see the "Encoder interfaces" section).

$P_{24V Out}$... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

$P_{Fan8B0M}$... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

⁴⁾ Only 8BCM motor cables from B&R are permitted to be connected to the motor connectors.

⁵⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁶⁾ Value for the nominal switching frequency.

⁷⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

⁸⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).

⁹⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

¹⁰⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.

¹¹⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load. When using 2-axis modules, the increased CPU load reduces the functionality of the drive; if this is not taken into consideration, the computing time can be exceeded in extreme cases.

¹²⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

¹³⁾ The specified value is only valid under the following conditions:

- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.

If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.

¹⁴⁾ Only 8BCF EnDat 2.2 cables from B&R are permitted to be connected to the encoder interfaces.

¹⁵⁾ An EnDat 2.2 functional safety encoder is required when using ACOPOSmulti SafeMOTION inverter modules! With standard EnDat 2.2 encoders, only the STO, SBC and time-monitored SS1 safety functions are available!

¹⁶⁾ I_{Encoder} ... Max. power consumption of the connected encoder [A].

¹⁷⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  763.

2-axis SafeMOTION EnDat 2.2 inverter modules 11-16 kW

Technical data



8BV10110HWDS.000-1

8BV10110HCDS.000-1

8BV10220HWDS.000-1

8BV10220HCDS.000-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification				
CE			Yes	
cULus			Yes	
KC			Yes	
FSC			Yes	

DC bus connection

Continuous power consumption ¹⁾	22.3 kW		32.37 kW	
Power loss depending on the switching frequency ²⁾				
Switching frequency 5 kHz	$[0.33 * I_M^2 + 11 * I_M + 90]$ W		$[0.65 * I_M^2 - 0.35 * I_M + 64]$ W	
Switching frequency 10 kHz	$[0.97 * I_M^2 + 9.5 * I_M + 170]$ W		$[2.16 * I_M^2 - 10.912 * I_M + 190]$ W	
Switching frequency 20 kHz	$[1.66 * I_M^2 + 21 * I_M + 380]$ W		-	
DC bus capacitance	660 µF		1320 µF	

24 VDC supply

Input capacitance		23.5 µF		
Max. power consumption		$32 \text{ W} + P_{SMC1} + P_{SMC2} + P_{24 \text{ V Out}} + P_{\text{HoldingBrake(s)}} + 2 * P_{\text{Fan8BOM...}}$ ³⁾		

24 VDC output

Quantity		2		
Output voltage				
DC bus voltage (U _{DC}): 260 to 315 VDC		25 VDC * (U _{DC} /315)		
DC bus voltage (U _{DC}): 315 to 800 VDC		24 VDC ±6%		
Protection		250 mA (slow-blow) electronic, automatic reset		

Motor connection ⁴⁾

Quantity		2		
Continuous power per motor connection ¹⁾	11 kW		16 kW	
Continuous current per motor connection ¹⁾	15.1 A _{eff}		22 A _{eff}	
Reduction of continuous current depending on the switching frequency ⁵⁾				
Switching frequency 5 kHz	No reduction ⁶⁾	-	0.33 A/K (from 40°C) ⁶⁾	-
Switching frequency 10 kHz	0.19 A/K (from 29°C) ⁷⁾	-	0.17 A/K (from -25°C) ⁷⁾	-
Switching frequency 20 kHz	0.15 A/K (from -38°C) ⁷⁾		-	
Reduction of continuous current depending on the switching frequency and mounting method ⁵⁾				
Switching frequency 5 kHz				
Cold plate mounting ⁸⁾	-	0.38 A/K (from 51°C) ⁶⁾	-	0.99 A/K (from 40°C) ⁶⁾
Feed-through mounting	-	0.27 A/K (from 46°C) ⁶⁾	-	0.52 A/K (from 40°C) ⁶⁾

Technical data

	8BV10110HWDS.000-1	8BV10110HCDS.000-1	8BV10220HWDS.000-1	8BV10220HCDS.000-1
Switching frequency 10 kHz				
Cold plate mounting ⁸⁾	-	0.25 A/K (from 24°C) ⁹⁾	-	0.29 A/K (from 10°C) ⁹⁾
Feed-through mounting	-	0.16 A/K (from 2°C) ⁷⁾	-	0.23 A/K (from 0°C) ⁷⁾
Switching frequency 20 kHz				
Cold plate mounting ⁸⁾	-	0.19 A/K (from -14°C) ⁹⁾	-	-
Feed-through mounting	-	0.14 A/K (from -74°C) ⁷⁾	-	-
Reduction of continuous current depending on the installation elevation				
Starting at 500 m above sea level	1.51 A _{eff} per 1000 m		2.2 A _{eff} per 1000 m	
Peak current per motor connection	37.7 A _{eff}		55 A _{eff} ¹⁰⁾	
Possible switching frequencies ¹¹⁾	5/10/20 kHz		5/10 kHz	
Design				
U, V, W, PE	Male connector			
Shield connection	Yes			
Terminal connection cross section				
Flexible and fine wire lines				
With wire end sleeves	0.25 to 4 mm ²			
Approbation data				
UL/C-UL-US	30 to 10			
CSA	28 to 10			
Terminal cable cross section dimension of shield connection	12 to 22 mm			
Max. motor line length depending on the switching frequency				
Switching frequency 5 kHz	25 m			
Switching frequency 10 kHz	25 m			
Switching frequency 20 kHz	10 m		-	
Motor holding brake connection				
Quantity	2			
Output voltage ¹²⁾	24 VDC +5.8% / -0.5% ¹³⁾			
Continuous current	2.1 A			
Max. internal resistance	0.3 Ω			
Max. extinction energy per switching operation	3 Ws			
Response threshold for open line monitoring	Approx. 0.5 A			
Encoder interfaces ¹⁴⁾				
Quantity	2			
Type	EnDat 2.2 ¹⁵⁾			
Connections	9-pin female DSUB connector			
Encoder supply				
Output voltage	Typ. 12.5 V			
Load capability	350 mA			
Protective measures				
Short circuit protection	Yes			
Overload protection	Yes			

2-axis SafeMOTION EnDat 2.2 inverter modules 11-16 kW

Technical data

8BVI0110HWDS.000-1

8BVI0110HCDS.000-1

8BVI0220HWDS.000-1

8BVI0220HCDS.000-1

Synchronous serial interface				
Signal transmission	RS485			
Data transfer rate	6.25 Mbit/s			
Max. power consumption per encoder interface	$P_{SMC}[W] = 19 V * I_{Encoder}[A]$ ¹⁶⁾			
Operating conditions				
Permitted mounting orientations				
Lying horizontally	Yes			
EN 60529 protection	IP20			
Mechanical characteristics				
Dimensions ¹⁷⁾				
Width	106.5 mm			
Height	317 mm			
Depth				
Wall mounting	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm
Weight	Approx. 5.3 kg	Approx. 4.1 kg	Approx. 5.7 kg	Approx. 4.4 kg
Module width	2			

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ I_M ... Average value of the currents on both motor connectors [A].

³⁾ P_{SMC1} ... Max. power consumption P_{SMC} [W] of the SafeMOTION module in SLOT1 (see the "Encoder interfaces" section).

P_{SMC2} ... Max. power consumption P_{SMC} [W] of the SafeMOTION module in SLOT2 (see the "Encoder interfaces" section).

$P_{24V Out}$... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

$P_{Fan8B0M}$... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

⁴⁾ Only 8BCM motor cables from B&R are permitted to be connected to the motor connectors.

⁵⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min). The temperature specifications refer to the return temperature of the cold plate mounting plate.

⁶⁾ Value for the nominal switching frequency.

⁷⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

⁸⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

⁹⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.

¹⁰⁾ The thermal pulse load capacity is lower than for the 8BVI0220HxS0.000-1 1-axis module. It is therefore not possible to simply replace two 8BVI0220HxS0.000-1 1-axis modules with one 8BVI0220HxD0.000-1 2-axis module. If this is required, the load cycle must be examined in detail.

¹¹⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load. When using 2-axis modules, the increased CPU load reduces the functionality of the drive; if this is not taken into consideration, the computing time can be exceeded in extreme cases.

¹²⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

¹³⁾ The specified value is only valid under the following conditions:

- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.

If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.

¹⁴⁾ Only 8BCF EnDat 2.2 cables from B&R are permitted to be connected to the encoder interfaces.

¹⁵⁾ An EnDat 2.2 functional safety encoder is required when using ACOPOSmulti SafeMOTION inverter modules! With standard EnDat 2.2 encoders, only the STO, SBC and time-monitored SS1 safety functions are available!

¹⁶⁾ I_{Encoder} ... Max. power consumption of the connected encoder [A].

¹⁷⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  763.

Inverter module SafeMOTION SinCos (1-axis module)

Features

- Clearly structured, straightforward implementation via network-based safety technology
- Modular expandability through virtual wiring
- Immediate triggering of safety function due to short cycle times
- Easy implementation with transparent control and status information, even in the standard application
- Compact design

Technical data for all modules

General information	
Slots for plug-in modules	2 ¹⁾
DC bus connection	
Voltage	
Nominal	750 VDC
Design	ACOPOSmulti backplane
24 VDC supply	
Input voltage	25 VDC ±1.6%
Design	ACOPOSmulti backplane
Motor connection ²⁾	
Quantity	1
Nominal switching frequency	5 kHz
Possible switching frequencies ³⁾	5/10/20 kHz
Electrical stress of the connected motor in accordance with IEC TS 60034-25 ⁴⁾	Limit value curve A
Protective measures	
Overload protection	Yes
Short circuit and ground fault protection	Yes
Max. output frequency	598 Hz ⁵⁾
Motor holding brake connection	
Quantity	1
Extinction potential	Approx. 30 V
Max. switching frequency	0.5 Hz
Protective measures	
Overload and short circuit protection	Yes
Open line monitoring	Yes
Undervoltage monitoring	Yes
Response threshold for undervoltage monitoring	24 VDC -2% / -4%
Encoder interfaces ⁶⁾	
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	No
Encoder monitoring	Yes
Max. encoder cable length	50 m ⁷⁾
Encoder supply	
Protective measures	
Short circuit protection	Yes
Overload protection	Yes

Synchronous serial interface	
Signal transmission	RS485
Sine/Cosine inputs	
Signal transmission	Differential signals, symmetrical
Differential voltage deviation per signal period	$\pm 10\%$ ⁸⁾
Common-mode voltage	Max. ± 7 V
Terminating resistors	120 Ω
Max. input frequency	200 kHz
Signal frequency (-5 dB)	<300 kHz
Signal frequency (-3 dB)	DC up to 200 kHz
ADC resolution	12-bit
Reference input	
Signal transmission	Differential signal, symmetrical
Differential voltage for low	≤ -0.2 V
Differential voltage for high	≥ 0.2 V
Common-mode voltage	Max. -5 V to +9 V
Terminating resistors	120 Ω
Position	
Resolution @ 1 V _{SS} ⁹⁾	Number of encoder lines * 5700
Precision ¹⁰⁾	---
Noise ¹⁰⁾	---
Trigger inputs	
Quantity	2
Wiring	Sink
Electrical isolation	
Input - Inverter module	Yes
Input - Input	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Switching threshold	
Low	<5 V
High	>15 V
Input current at nominal voltage	Approx. 10 mA
Switching delay	
Rising edge	52 μ s \pm 0.5 μ s (digitally filtered)
Falling edge	53 μ s \pm 0.5 μ s (digitally filtered)
Modulation compared to ground potential	Max. ± 38 V
Operating conditions	
Permitted mounting orientations	
Hanging vertically	Yes
Lying horizontally	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ¹¹⁾	4000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	III
EN 60529 protection	IP20 ¹²⁾

Inverter module SafeMOTION SinCos (1-axis module)

Environmental conditions

Temperature

Operation

Nominal

5 to 40°C

Maximum ¹³⁾

55°C

Storage

-25 to 55°C

Transport

-25 to 70°C

Relative humidity

Operation

5 to 85%

Storage

5 to 95%

Transport

Max. 95% at 40°C

¹⁾ SLOT 2 is not occupied. SLOT 1 of the ACOPOSmulti module is occupied by the SafeMOTION module.

²⁾ Only 8BCM motor cables from B&R are permitted to be connected to the motor connectors.

³⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁴⁾ If necessary, the stress of the motor isolation system can be reduced by an additional externally wired dv/dt choke. For example, the RWK 305 three-phase du/dt choke from Schaffner (www.schaffner.com) can be used. Important: Even when using a dv/dt choke, it is necessary to ensure that an EMC-compatible, low inductance shield connection is used!

⁵⁾ The module's electrical output frequency (SCTRL_SPEED_ACT * MOTOR_POLEPAIRS) is monitored to protect against dual use in accordance with EC regulation 428/2009 | 3A225. If the electrical output frequency of the module exceeds the limit value of 598 Hz uninterrupted for more than 0.5 s, then the current movement is aborted and error 6060 is output (Power element: Limit speed exceeded).

⁶⁾ Only shielded cables are permitted to be used.

The stranded wire for the analog interface (Sin, nSin, Cos, nCos, Ref, nRef) and the digital interface (T, nT, D, nD) must be twisted pair with a wave impedance of 120 Ω ±10%. Additional shielding of the analog interface is recommended.

⁷⁾ The maximum permitted cable length is 50 m.

⁸⁾ The sine-cosine output signals from the measuring instrument are checked by the evaluation circuit using pointer length monitoring.

The pointer length $z = 2 \sqrt{((\text{Sin} - \text{nSin})^2 + (\text{Cos} - \text{nCos})^2)}$ is permitted to deviate by a maximum of ±10% per signal period.

⁹⁾ This value does not correspond to the encoder resolution that must be configured in Automation Studio (16384 * number of encoder lines).

¹⁰⁾ Limited by the encoder in practice.

¹¹⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration).

¹²⁾ This value only applies in its delivered state (SLOT2 of the module is sealed by a slot cover / shield plate). If SLOT2 on the module is not sealed, then the level of protection is reduced to IP10. It is important to note that a 8SCS005.0000-00 shield set (slot cover / shield plate) or plug-in module must always be inserted!

¹³⁾ Continuous operation at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

1-axis SafeMOTION SinCos inverter modules 1.4-11 kW

Technical data



8BV10014HWSA.000-1

8BV10014HCSA.000-1

8BV10028HWSA.000-1

8BV10028HCSA.000-1

8BV10055HWSA.000-1

8BV10055HCSA.000-1

8BV10110HWSA.000-1

8BV10110HCSA.000-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification								
CE					Yes			
cULus					Yes			
FSC					Yes			

DC bus connection

Continuous power consumption ¹⁾	1.46 kW	2.87 kW	5.6 kW	11.2 kW
Power loss depending on the switching frequency ²⁾				
Switching frequency 5 kHz	[0.6 * I _M ² + 1.3 * I _M + 60] W		[0.16 * I _M ² + 5.6 * I _M + 55] W	
Switching frequency 10 kHz	[0.97 * I _M ² + 0.5 * I _M + 110] W		[0.49 * I _M ² + 4.7 * I _M + 95] W	
Switching frequency 20 kHz	[1.7 * I _M ² - 0.7 * I _M + 225] W		[0.87 * I _M ² + 10 * I _M + 200] W	
DC bus capacitance	165 µF		330 µF	

24 VDC supply

Input capacitance	23.5 µF
Max. power consumption	25 W + P _{SMC1} + P _{SLOT2} + P _{24 V Out} + P _{Holdin Brake} + P _{Fan8B0M...} ³⁾

24 VDC output

Quantity	2
Output voltage	
DC bus voltage (U _{DC}): 260 to 315 VDC	25 VDC * (U _{DC} /315)
DC bus voltage (U _{DC}): 315 to 800 VDC	24 VDC ±6%
Protection	250 mA (slow-blow) electronic, automatic reset

Motor connection ⁴⁾

Quantity	1							
Continuous power per motor connection ¹⁾	1.4 kW	2.8 kW	5.5 kW	11 kW				
Continuous current per motor connection ¹⁾	1.9 A _{eff}	3.8 A _{eff}	7.6 A _{eff}	15.1 A _{eff}				
Reduction of continuous current depending on the switching frequency ⁵⁾								
Switching frequency 5 kHz	No reduction ⁶⁾	-	No reduction ⁶⁾	-	No reduction ⁶⁾	-	No reduction ⁶⁾	-
Switching frequency 10 kHz	No reduction	-	No reduction	-	0.2 A/K (from 49°C)	-	0.26 A/K (from 33°C) ⁷⁾	-
Switching frequency 20 kHz	0.11 A/K (from 33°C) ⁷⁾	-	0.12 A/K (from 33°C) ⁷⁾	-	0.13 A/K (from 4°C) ⁷⁾	-	0.15 A/K (from -28°C) ⁷⁾	-

Reduction of continuous current depending on the switching frequency and mounting method ⁸⁾

1-axis SafeMOTION SinCos inverter modules 1.4-11 kW

Technical data

	8BV10014HWSA.000-1	8BV10014HCSA.000-1	8BV10028HWSA.000-1	8BV10028HCSA.000-1	8BV10055HWSA.000-1	8BV10055HCSA.000-1	8BV10110HWSA.000-1	8BV10110HCSA.000-1
Switching frequency 5 kHz								
Cold plate mounting ⁹⁾	-	No reduction ⁶⁾	-	No reduction ⁶⁾	-	0.65 A/K (from 57°C) ⁶⁾	-	0.73 A/K (from 55°C) ⁶⁾
Feed-through mounting	-	No reduction ⁶⁾	-	No reduction ⁶⁾	-	No reduction ⁶⁾	-	0.29 A/K (from 49°C) ⁶⁾
Switching frequency 10 kHz								
Cold plate mounting ⁹⁾	-	No reduction	-	0.6 A/K (from 58°C)	-	0.28 A/K (from 46°C)	-	0.32 A/K (from 35°C) ¹⁰⁾
Feed-through mounting	-	No reduction	-	No reduction	-	0.15 A/K (from 34°C) ⁷⁾	-	0.17 A/K (from 11°C) ¹¹⁾
Switching frequency 20 kHz								
Cold plate mounting ⁹⁾	-	0.13 A/K (from 46°C)	-	0.1 A/K (from 34°C) ¹⁰⁾	-	0.14 A/K (from 5°C) ¹⁰⁾	-	0.18 A/K (from -13°C) ¹⁰⁾
Feed-through mounting	-	0.1 A/K (from 41°C)	-	0.1 A/K (from 18°C) ⁷⁾	-	0.08 A/K (from -33°C) ⁷⁾	-	0.11 A/K (from -73°C) ¹¹⁾
Reduction of continuous current depending on the installation elevation								
Starting at 500 m above sea level	0.19 A _{eff} per 1000 m		0.38 A _{eff} per 1000 m		0.76 A _{eff} per 1000 m		1.51 A _{eff} per 1000 m	
Peak current	4.7 A _{eff}		9.5 A _{eff}		18.9 A _{eff}		37.7 A _{eff}	
Possible switching frequencies ¹²⁾	5/10/20 kHz							
Design								
U, V, W, PE	Male connector							
Shield connection	Yes							
Terminal connection cross section								
Flexible and fine wire lines								
With wire end sleeves	0.25 to 4 mm ²							
Approbation data								
UL/C-UL-US	30 to 10							
CSA	28 to 10							
Terminal cable cross section dimension of shield connection	12 to 22 mm							
Max. motor line length depending on the switching frequency								
Switching frequency 5 kHz	25 m							
Switching frequency 10 kHz	25 m							
Switching frequency 20 kHz	10 m							
Motor holding brake connection								
Quantity	1							
Output voltage ¹³⁾	24 VDC +5.8% / -0% ¹⁴⁾							
Continuous current	1.1 A				2.1 A			
Max. internal resistance	0.5 Ω				0.3 Ω			
Max. extinction energy per switching operation	1.5 Ws				3 Ws			
Response threshold for open line monitoring	Approx. 0.25 A				Approx. 0.5 A			

Technical data

8BV10014HWSA.000-1

8BV10014HCSA.000-1

8BV10028HWSA.000-1

8BV10028HCSA.000-1

8BV10055HWSA.000-1

8BV10055HCSA.000-1

8BV10110HWSA.000-1

8BV10110HCSA.000-1

Encoder interfaces ¹⁵⁾

Quantity	1
Type	SinCos
Connections	15-pin female DSUB connector
Encoder supply	
Output voltage	5 V ±5% ¹⁶⁾
Load capability	300 mA ¹⁷⁾
Sense lines	2, compensation of max. 2 x 0.7 V
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	781.25 kbit/s
Sine/Cosine inputs	
Differential voltage	
In motion	0.5 to 1.35 V ¹⁸⁾
At standstill	0.8 to 1.35 V ¹⁹⁾
Max. power consumption per encoder interface	$P_{SMC}[W] = 25 V * (0.376 A + 0.35 * I_{Encoder}[A])$ ²⁰⁾

Operating conditions

Permitted mounting orientations	
Lying horizontally	Yes
EN 60529 protection	IP20 ²¹⁾

Mechanical characteristics

Dimensions ²²⁾								
Width	53 mm							
Height	317 mm							
Depth								
Wall mounting	263 mm	-	263 mm	-	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm	-	209 mm	-	209 mm
Weight	Approx. 2.6 kg	Approx. 2.1 kg	Approx. 2.6 kg	Approx. 2.1 kg	Approx. 2.7 kg	Approx. 2.2 kg	Approx. 2.9 kg	Approx. 2.4 kg
Module width	1							

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ $I_{M...}$ Current on the motor connection [A].

³⁾ P_{SMC1} ... Max. power consumption P_{SMC} [W] of the SafeMOTION module in SLOT1 (see the "Encoder interfaces" section).

P_{SLOT2} ... Max. power consumption P_{SBAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).

$P_{24V Out}$... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

$P_{Fan8B0M...}$... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

⁴⁾ Only 8BCM motor cables from B&R are permitted to be connected to the motor connectors.

⁵⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

Technical data

- ⁶⁾ Value for the nominal switching frequency.
- ⁷⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
- ⁸⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).
- ⁹⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.
- ¹⁰⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.
- ¹¹⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
- ¹²⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.
- ¹³⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.
- ¹⁴⁾ The specified value is only valid under the following conditions:
- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.
If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.
- ¹⁵⁾ Only shielded cables are permitted to be used.
The stranded wire for the analog interface (Sin, nSin, Cos, nCos, Ref, nRef) and the digital interface (T, nT, D, nD) must be twisted pair with a wave impedance of $120 \Omega \pm 10\%$.
Additional shielding of the analog interface is recommended.
- ¹⁶⁾ During the power-on procedure for the encoder supply voltage (2 seconds), the monitoring limit for the supply voltage is increased from 5.25 V to 6 V. In this phase, overvoltages up to 6 V are not detected.
A short-term overvoltage of maximum 6 V should not damage the encoder electronics in any way.
An undervoltage on the encoder supply will result in a sine or cosine signal outside the specification.
- ¹⁷⁾ An actual reserve of 12 mA exists for the terminating resistor.
- ¹⁸⁾ The sine-cosine output signals from the measuring instrument are checked by the evaluation circuit using pointer length monitoring.
The pointer length $z = 2 \sqrt{(\text{Sin} - \text{nSin})^2 + (\text{Cos} - \text{nCos})^2}$ is monitored according to the specified limits.
- ¹⁹⁾ The sine-cosine output signals from the measuring instrument are checked by the evaluation circuit using pointer length monitoring.
The pointer length $z = 2 \sqrt{(\text{Sin} - \text{nSin})^2 + (\text{Cos} - \text{nCos})^2}$ is also monitored according to the specified limits from the time the evaluation circuit is switched on until a signal period has passed.
- ²⁰⁾ $I_{\text{Encoder}} \dots$ Max. power consumption of the connected encoder [A].
- ²¹⁾ This value only applies in its delivered state (SLOT2 of the module is sealed by a slot cover / shield plate). If SLOT2 on the module is not sealed, then the level of protection is reduced to IP10. It is important to note that a 8SCS005.0000-00 shield set (slot cover / shield plate) or plug-in module must always be inserted!
- ²²⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  774.

1-axis SafeMOTION SinCos inverter modules 16-32 kW

Technical data



8BV10220HWSA.000-1

8BV10220HCESA.000-1

8BV10330HWSA.000-1

8BV10330HCESA.000-1

8BV10440HWSA.000-1

8BV10440HCESA.000-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification						
CE				Yes		
cULus				Yes		
KC						Yes
FSC				Yes		

DC bus connection

Continuous power consumption ¹⁾	16.2 kW		24.4 kW		32.5 kW
Power loss depending on the switching frequency ²⁾					
Switching frequency 5 kHz	[0.13 * I _M ² + 5.5 * I _M + 40] W		[0.07 * I _M ² + 7.3 * I _M + 40] W		
Switching frequency 10 kHz	[0.43 * I _M ² + 3.7 * I _M + 110] W		[0.2 * I _M ² + 11.1 * I _M + 130] W		
Switching frequency 20 kHz	[1.4 * I _M ² + 1.97 * I _M + 230] W		[1.85 * I _M ² + 3.8 * I _M + 300] W		
DC bus capacitance	495 µF		990 µF		

24 VDC supply

Input capacitance	32.9 µF
Max. power consumption	25 W + P _{SMC1} + P _{SLOT2} + P _{24 V Out} + P _{HoldingBrake} + P _{Fan8BOM...} ³⁾

24 VDC output

Quantity	2
Output voltage	
DC bus voltage (U _{DC}): 260 to 315 VDC	25 VDC * (U _{DC} /315)
DC bus voltage (U _{DC}): 315 to 800 VDC	24 VDC ±6%
Protection	250 mA (slow-blow) electronic, automatic reset

Motor connection ⁴⁾

Quantity	1					
Continuous power per motor connection ¹⁾	16 kW		24 kW		32 kW	
Continuous current per motor connection ¹⁾	22 A _{eff}		33 A _{eff}		44 A _{eff}	
Reduction of continuous current depending on the switching frequency ⁵⁾						
Switching frequency 5 kHz	No reduction ⁶⁾	-	1.57 A/K (from 40°C) ⁶⁾	-	1.57 A/K (from 40°C) ⁶⁾	-
Switching frequency 10 kHz	0.4 A/K (from 31°C) ⁷⁾	-	0.5 A/K (from -10°C) ⁷⁾	-	0.5 A/K (from -10°C) ⁷⁾	-
Switching frequency 20 kHz	0.31 A/K (from -16°C) ⁷⁾	-	0.36 A/K (from -77°C) ⁷⁾	-	0.36 A/K (from -77°C) ⁷⁾	-

Reduction of continuous current depending on the switching frequency and mounting method ⁸⁾

Switching frequency 5 kHz						
Cold plate mounting ⁹⁾	-	No reduction ⁶⁾	-	0.8 A/K (from 45°C) ⁶⁾	-	0.8 A/K (from 45°C) ⁶⁾
Feed-through mounting	-	No reduction ⁶⁾	-	1.26 A/K (from 40°C) ⁶⁾	-	1.26 A/K (from 40°C) ⁶⁾

1-axis SafeMOTION SinCos inverter modules 16-32 kW

Technical data

	8BV10220HWSA.000-1	8BV10220HCSA.000-1	8BV10330HWSA.000-1	8BV10330HCSA.000-1	8BV10440HWSA.000-1	8BV10440HCSA.000-1
Switching frequency 10 kHz						
Cold plate mounting ⁹⁾	-	0.36 A/K (from 5°C) ¹⁰⁾	-	0.62 A/K (from 6°C) ¹⁰⁾	-	0.62 A/K (from 6°C) ¹⁰⁾
Feed-through mounting	-	0.39 A/K (from 26°C) ⁷⁾	-	0.37 A/K (from -36°C) ⁷⁾	-	0.37 A/K (from -36°C) ⁷⁾
Switching frequency 20 kHz						
Cold plate mounting ⁹⁾	-	0.5 A/K (from 49°C)	-	0.32 A/K (from -82°C) ¹⁰⁾	-	0.32 A/K (from -82°C) ¹⁰⁾
Feed-through mounting	-	0.15 A/K (from -59°C) ⁷⁾	-	0.24 A/K (from -137°C) ⁷⁾	-	0.24 A/K (from -137°C) ⁷⁾
Reduction of continuous current depending on the installation elevation						
Starting at 500 m above sea level	2.2 A _{eff} per 1000 m		3.3 A _{eff} per 1000 m		4.4 A _{eff} per 1000 m	
Peak current	55 A _{eff}		83 A _{eff}		88 A _{eff}	
Possible switching frequencies ¹¹⁾			5/10/20 kHz			
Design						
U, V, W, PE			Male connector			
Shield connection			Yes			
Terminal connection cross section						
Flexible and fine wire lines			0.5 to 16 mm ²			
With wire end sleeves						
Approbation data						
UL/C-UL-US	20 to 8				20 to 6	
CSA	20 to 8				20 to 6	
Terminal cable cross section dimension of shield connection	12 to 22 mm				23 to 35 mm	
Max. motor line length depending on the switching frequency						
Switching frequency 5 kHz			25 m			
Switching frequency 10 kHz			25 m			
Switching frequency 20 kHz			25 m			
Motor holding brake connection						
Quantity			1			
Output voltage ¹²⁾			24 VDC +5.8% / -0.5% ¹³⁾			
Continuous current			4.2 A			
Max. internal resistance			0.15 Ω			
Max. extinction energy per switching operation			3 Ws			
Response threshold for open line monitoring			Approx. 0.5 A			
Encoder interfaces ¹⁴⁾						
Quantity			1			
Type			SinCos			
Connections			15-pin female DSUB connector			
Encoder supply						
Output voltage			5 V ±5% ¹⁵⁾			
Load capability			300 mA ¹⁶⁾			
Sense lines			2, compensation of max. 2 x 0.7 V			

Technical data

8BV10220HWSA.000-1

8BV10220HCSA.000-1

8BV10330HWSA.000-1

8BV10330HCSA.000-1

8BV10440HWSA.000-1

8BV10440HCSA.000-1

Protective measures						
Short circuit protection						Yes
Overload protection						Yes
Synchronous serial interface						
Signal transmission						RS485
Data transfer rate						781.25 kbit/s
Sine/Cosine inputs						
Differential voltage						
In motion						0.5 to 1.35 V ¹⁷⁾
At standstill						0.8 to 1.35 V ¹⁸⁾
Max. power consumption per encoder interface						$P_{SMC}[W] = 25 V * (0.376 A + 0.35 * I_{Encoder}[A])$ ¹⁹⁾

Operating conditions

Permitted mounting orientations						
Lying horizontally						Yes
EN 60529 protection						IP20 ²⁰⁾

Mechanical characteristics

Dimensions ²¹⁾						
Width						106.5 mm
Height						317 mm
Depth						
Wall mounting	263 mm	-	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm	-	209 mm
Weight	Approx. 5.2 kg	Approx. 3.9 kg	Approx. 5.4 kg	Approx. 4.3 kg	Approx. 5.4 kg	Approx. 4.3 kg
Module width						2

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ I_M ... Current on the motor connection [A].

³⁾ P_{SMC1} ... Max. power consumption P_{SMC} [W] of the SafeMOTION module in SLOT1 (see the "Encoder interfaces" section).

P_{SLOT2} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).

$P_{24 V Out}$... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

$P_{Fan8B0M}$... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

⁴⁾ Only 8BCM motor cables from B&R are permitted to be connected to the motor connectors.

⁵⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁶⁾ Value for the nominal switching frequency.

⁷⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

⁸⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).

⁹⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

¹⁰⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.

¹¹⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

Technical data

- ¹²⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.
- ¹³⁾ The specified value is only valid under the following conditions:
- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.
If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.
- ¹⁴⁾ Only shielded cables are permitted to be used.
The stranded wire for the analog interface (Sin, nSin, Cos, nCos, Ref, nRef) and the digital interface (T, nT, D, nD) must be twisted pair with a wave impedance of $120 \Omega \pm 10\%$.
Additional shielding of the analog interface is recommended.
- ¹⁵⁾ During the power-on procedure for the encoder supply voltage (2 seconds), the monitoring limit for the supply voltage is increased from 5.25 V to 6 V. In this phase, overvoltages up to 6 V are not detected.
A short-term overvoltage of maximum 6 V should not damage the encoder electronics in any way.
An undervoltage on the encoder supply will result in a sine or cosine signal outside the specification.
- ¹⁶⁾ An actual reserve of 12 mA exists for the terminating resistor.
- ¹⁷⁾ The sine-cosine output signals from the measuring instrument are checked by the evaluation circuit using pointer length monitoring.
The pointer length $z = 2 \sqrt{(\text{Sin} - n\text{Sin})^2 + (\text{Cos} - n\text{Cos})^2}$ is monitored according to the specified limits.
- ¹⁸⁾ The sine-cosine output signals from the measuring instrument are checked by the evaluation circuit using pointer length monitoring.
The pointer length $z = 2 \sqrt{(\text{Sin} - n\text{Sin})^2 + (\text{Cos} - n\text{Cos})^2}$ is also monitored according to the specified limits from the time the evaluation circuit is switched on until a signal period has passed.
- ¹⁹⁾ I_{Encoder} ... Max. power consumption of the connected encoder [A].
- ²⁰⁾ This value only applies in its delivered state (SLOT2 of the module is sealed by a slot cover / shield plate). If SLOT2 on the module is not sealed, then the level of protection is reduced to IP10. It is important to note that a 8SCS005.0000-00 shield set (slot cover / shield plate) or plug-in module must always be inserted!
- ²¹⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  774.

1-axis SafeMOTION SinCos inverter modules 48-64 kW

Technical data



8BVI0660HWSA.000-1

8BVI0660HCESA.000-1

8BVI0880HWSA.004-1

8BVI0880HCESA.004-1

General information

Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting	Wall mounting	Cold plate or feed-through mounting
Certification				
CE	Yes			
cULus	Yes			
FSC	Yes			

DC bus connection

Continuous power consumption ¹⁾	48.8 kW		65 kW
Power loss depending on the switching frequency ²⁾			
Switching frequency 5 kHz	[0.03 * I _M ² + 7.9 * I _M + 90] W		
Switching frequency 10 kHz	[0.11 * I _M ² + 11 * I _M + 185] W		
Switching frequency 20 kHz	[0.17 * I _M ² + 27 * I _M + 310] W		
DC bus capacitance	1980 μF		

24 VDC supply

Input capacitance	32.9 μF		
Max. power consumption	25 W + P _{SMC1} + P _{SLOT2} + P _{24 V Out} + P _{HoldingBrake} + P _{Fan8B0M...} ³⁾		

24 VDC output

Quantity	2		
Output voltage			
DC bus voltage (U _{DC}): 260 to 315 VDC	25 VDC * (U _{DC} /315)		
DC bus voltage (U _{DC}): 315 to 800 VDC	24 VDC ±6%		
Protection	250 mA (slow-blow) electronic, automatic reset		

Motor connection ⁴⁾

Quantity	1		
Continuous power per motor connection ¹⁾	48 kW		64 kW
Continuous current per motor connection ¹⁾	66 A _{eff}		88 A _{eff}
Reduction of continuous current depending on the switching frequency ⁵⁾			
Switching frequency 5 kHz	1.4 A/K (from 41°C) ⁶⁾	-	1.4 A/K (from 41°C) ⁶⁾
Switching frequency 10 kHz	0.92 A/K (from -5°C) ⁷⁾	-	0.92 A/K (from -5°C) ⁷⁾
Switching frequency 20 kHz	0.56 A/K (from -90°C) ⁷⁾	-	0.56 A/K (from -90°C) ⁷⁾

Reduction of continuous current depending on the switching frequency and mounting method ⁸⁾

Switching frequency 5 kHz				
Cold plate mounting ⁹⁾	-	1.9 A/K (from 58°C) ⁶⁾	-	1.9 A/K (from 58°C) ⁶⁾
Feed-through mounting	-	1.82 A/K (from 40°C) ⁶⁾	-	1.82 A/K (from 40°C) ⁶⁾

1-axis SafeMOTION SinCos inverter modules 48-64 kW

Technical data

	8BV10660HWSA.000-1	8BV10660HCSA.000-1	8BV10880HWSA.004-1	8BV10880HCSA.004-1
Switching frequency 10 kHz				
Cold plate mounting ⁹⁾	-	1.36 A/K (from 27°C) ¹⁰⁾	-	1.36 A/K (from 27°C) ¹⁰⁾
Feed-through mounting	-	0.88 A/K (from -12°C) ⁷⁾	-	0.88 A/K (from -12°C) ⁷⁾
Switching frequency 20 kHz				
Cold plate mounting ⁹⁾	-	0.75 A/K (from -37°C) ¹⁰⁾	-	0.75 A/K (from -37°C) ¹⁰⁾
Feed-through mounting	-	0.54 A/K (from -106°C) ⁷⁾	-	0.54 A/K (from -106°C) ⁷⁾
Reduction of continuous current depending on the installation elevation				
Starting at 500 m above sea level	6.6 A _{eff} per 1000 m		8.8 A _{eff} per 1000 m	
Peak current	132 A _{eff}		176 A _{eff}	
Possible switching frequencies ¹¹⁾		5/10/20 kHz		
Design				
U, V, W, PE		M8 threaded bolt		
Shield connection		Yes		
Connection cross section range				
Flexible and fine wire lines		6 to 50 mm ² ¹²⁾		
Approbation data				
UL/C-UL-US		In preparation		
CSA		In preparation		
Terminal cable cross section dimension of shield connection		12 to 50 mm ¹³⁾		
Max. motor line length depending on the switching frequency				
Switching frequency 5 kHz		25 m		
Switching frequency 10 kHz		25 m		
Switching frequency 20 kHz		25 m		
Motor holding brake connection				
Quantity		1		
Output voltage ¹⁴⁾		24 VDC +5.8% / -0.5% ¹⁵⁾		
Continuous current		4.2 A		
Max. internal resistance		0.15 Ω		
Max. extinction energy per switching operation		3 Ws		
Response threshold for open line monitoring		Approx. 0.5 A		
Encoder interfaces ¹⁶⁾				
Quantity		1		
Type		SinCos		
Connections		15-pin female DSUB connector		
Encoder supply				
Output voltage		5 V ±5% ¹⁷⁾		
Load capability		300 mA ¹⁸⁾		
Sense lines		2, compensation of max. 2 x 0.7 V		
Protective measures				
Short circuit protection		Yes		
Overload protection		Yes		

Technical data

8BV10660HWSA.000-1

8BV10660HCESA.000-1

8BV10880HWSA.004-1

8BV10880HCESA.004-1

Synchronous serial interface				
Signal transmission	RS485			
Data transfer rate	781.25 kbit/s			
Sine/Cosine inputs				
Differential voltage				
In motion	0.5 to 1.35 V ¹⁹⁾			
At standstill	0.8 to 1.35 V ²⁰⁾			
Max. power consumption per encoder interface	$P_{SMC}[W] = 25 V * (0.376 A + 0.35 * I_{Encoder}[A])$ ²¹⁾			
Operating conditions				
Permitted mounting orientations				
Lying horizontally	Yes			
EN 60529 protection	IP20 ²²⁾			
Mechanical characteristics				
Dimensions ²³⁾				
Width	213.5 mm			
Height	317 mm			
Depth				
Wall mounting	263 mm	-	263 mm	-
Cold plate	-	212 mm	-	212 mm
Feed-through mounting	-	209 mm	-	209 mm
Weight	Approx. 10.9 kg	Approx. 8 kg	Approx. 10.9 kg	Approx. 8 kg
Module width	4			

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ $I_{M...}$ Current on the motor connection [A].

³⁾ P_{SMC1} ... Max. power consumption P_{SMC} [W] of the SafeMOTION module in SLOT1 (see the "Encoder interfaces" section).

P_{SLOT2} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).

$P_{24 V Out}$... Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

$P_{Fan8B0M...}$... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

⁴⁾ Only 8BCM motor cables from B&R are permitted to be connected to the motor connectors.

⁵⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁶⁾ Value for the nominal switching frequency.

⁷⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

⁸⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).

⁹⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

¹⁰⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.

¹¹⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

¹²⁾ The connection is made with cable lugs using an M8 threaded bolt. The rated cross section of the cable lug must match the wire cross section of the cable that is to be connected.

¹³⁾ The maximum diameter that can be clamped depends on the shield component set.

¹⁴⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

1-axis SafeMOTION SinCos inverter modules 120 kW

Technical data

- ¹⁵⁾ The specified value is only valid under the following conditions:
- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.
 - Connection between S1 and S2 (activation of the external holding brake) using a jumper with a max. length of 10 cm.
- If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.
- If jumpers longer than 10 cm are used to connect S1 and S2, then the output voltage is reduced because of voltage drops on the jumpers.
- ¹⁶⁾ Only shielded cables are permitted to be used.
- The stranded wire for the analog interface (Sin, nSin, Cos, nCos, Ref, nRef) and the digital interface (T, nT, D, nD) must be twisted pair with a wave impedance of $120 \Omega \pm 10\%$. Additional shielding of the analog interface is recommended.
- ¹⁷⁾ During the power-on procedure for the encoder supply voltage (2 seconds), the monitoring limit for the supply voltage is increased from 5.25 V to 6 V. In this phase, overvoltages up to 6 V are not detected.
- A short-term overvoltage of maximum 6 V should not damage the encoder electronics in any way.
- An undervoltage on the encoder supply will result in a sine or cosine signal outside the specification.
- ¹⁸⁾ An actual reserve of 12 mA exists for the terminating resistor.
- ¹⁹⁾ The sine-cosine output signals from the measuring instrument are checked by the evaluation circuit using pointer length monitoring.
- The pointer length $z = 2 \sqrt{(\text{Sin} - n\text{Sin})^2 + (\text{Cos} - n\text{Cos})^2}$ is monitored according to the specified limits.
- ²⁰⁾ The sine-cosine output signals from the measuring instrument are checked by the evaluation circuit using pointer length monitoring.
- The pointer length $z = 2 \sqrt{(\text{Sin} - n\text{Sin})^2 + (\text{Cos} - n\text{Cos})^2}$ is also monitored according to the specified limits from the time the evaluation circuit is switched on until a signal period has passed.
- ²¹⁾ I_{Encoder} ... Max. power consumption of the connected encoder [A].
- ²²⁾ This value only applies in its delivered state (SLOT2 of the module is sealed by a slot cover / shield plate). If SLOT2 on the module is not sealed, then the level of protection is reduced to IP10. It is important to note that a 8SCS005.0000-00 shield set (slot cover / shield plate) or plug-in module must always be inserted!
- ²³⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  774.

Technical data



8BV1650HCSS.000-1

General information

Cooling and mounting method	Cold plate or feed-through mounting
Certification	
CE	Yes
cULus	Yes
KC	Yes
FSC	Yes

DC bus connection

Continuous power consumption ¹⁾	121.8 kW
Power loss depending on the switching frequency ²⁾	
Switching frequency 5 kHz	$[0.001 * I_M^2 + 9.9 * I_M + 165] \text{ W}$
Switching frequency 10 kHz	$[0.17 * I_M^2 + 10.8 * I_M + 320] \text{ W}$
Switching frequency 20 kHz	In preparation
DC bus capacitance	3630 μF

24 VDC supply

Input capacitance	32.9 μF
Max. power consumption	$43 \text{ W} + P_{\text{SMC1}} + P_{\text{SLOT2}} + P_{24 \text{ V Out}} + P_{\text{HoldingBrake}} + 4 * P_{\text{Fan8B0M...}}^3)$

24 VDC output

Quantity	2
Output voltage	
DC bus voltage (U_{DC}): 260 to 315 VDC	25 VDC * ($U_{\text{DC}}/315$)
DC bus voltage (U_{DC}): 315 to 800 VDC	24 VDC $\pm 6\%$
Protection	250 mA (slow-blow) electronic, automatic reset

Motor connection ⁴⁾

Quantity	1
Continuous power per motor connection ¹⁾	120 kW
Continuous current per motor connection ¹⁾	165 A_{eff}
Reduction of continuous current depending on the switching frequency and mounting method ⁵⁾	
Switching frequency 5 kHz	
Cold plate mounting ⁶⁾	3.1 A/K (from 53°C) ⁷⁾
Feed-through mounting	2.82 A/K (from 40°C) ⁷⁾
Switching frequency 10 kHz	
Cold plate mounting ⁶⁾	1.8 A/K (from 17°C) ⁸⁾
Feed-through mounting	1.5 A/K (from -13°C) ⁹⁾
Switching frequency 20 kHz	
Cold plate mounting ⁶⁾	1.2 A/K (from -60°C) ⁸⁾
Feed-through mounting	0.72 A/K (from 141°C) ⁹⁾

Technical data

8BV1650HCSS.000-1

Reduction of continuous current depending on the installation elevation	
Starting at 500 m above sea level	16.5 A _{eff} per 1000 m
Peak current	330 A _{eff}
Possible switching frequencies ¹⁰⁾	5/10/20 kHz
Design	
U, V, W, PE	M8 threaded bolt
Shield connection	Yes
Connection cross section range	
Flexible and fine wire lines	6 to 95 mm ² ¹¹⁾
Approval data	
UL/C-UL-US	In preparation
CSA	In preparation
Terminal cable cross section dimension of shield connection	
	12 to 50 mm ¹²⁾
Max. motor line length depending on the switching frequency	
Switching frequency 5 kHz	25 m
Switching frequency 10 kHz	25 m
Switching frequency 20 kHz	25 m
Motor holding brake connection	
Quantity	1
Output voltage ¹³⁾	24 VDC +5.8% / -0.5% ¹⁴⁾
Continuous current	4.2 A
Max. internal resistance	0.15 Ω
Max. extinction energy per switching operation	3 Ws
Response threshold for open line monitoring	Approx. 0.5 A
Encoder interfaces ¹⁵⁾	
Quantity	1
Type	EnDat 2.2 ¹⁶⁾
Connections	9-pin female DSUB connector
Encoder supply	
Output voltage	Typ. 12.5 V
Load capability	350 mA
Protective measures	
Short circuit protection	Yes
Overload protection	Yes
Synchronous serial interface	
Signal transmission	RS485
Data transfer rate	6.25 Mbit/s
Max. power consumption per encoder interface	$P_{SMC}[W] = 19 V * I_{Encoder}[A]$ ¹⁷⁾

1-axis SafeMOTION SinCos inverter modules 120 kW

Technical data

8BVI1650HCSS.000-1

Operating conditions

Permitted mounting orientations	
Lying horizontally	Yes
EN 60529 protection	IP20 ¹⁸⁾

Mechanical characteristics

Dimensions ¹⁹⁾	
Width	427.5 mm
Height	317 mm
Depth	
Cold plate	212 mm
Feed-through mounting	209 mm
Weight	Approx. 19.5 kg
Module width	8

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ $I_{M...}$ Current on the motor connection [A].

³⁾ P_{SMC1} ... Max. power consumption P_{SMC} [W] of the SafeMOTION module in SLOT1 (see the "Encoder interfaces" section).

P_{SLOT2} ... Max. power consumption P_{8BAC} [W] of the plug-in module in SLOT2 (see the technical data for the respective plug-in module).

$P_{24V Out...}$ Power [W] that is output to the connections X2/+24 V Out 1 and X2/+24 V Out 2 on the module (max. 10 W).

$P_{Fan8B0M...}$ Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

⁴⁾ Only 8BCM motor cables from B&R are permitted to be connected to the motor connectors.

⁵⁾ Valid in the following conditions: 750 VDC DC bus voltage, minimum permissible coolant flow volume (3 l/min).

⁶⁾ The temperature specifications refer to the return temperature of the cold plate mounting plate.

⁷⁾ Value for the nominal switching frequency.

⁸⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
Caution! Condensation can occur at low flow temperatures and return temperatures.

⁹⁾ The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

¹⁰⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

¹¹⁾ The connection is made with cable lugs using an M8 threaded bolt. The rated cross section of the cable lug must match the wire cross section of the cable that is to be connected.

¹²⁾ The maximum diameter that can be clamped depends on the shield component set.

¹³⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

¹⁴⁾ The specified value is only valid under the following conditions:

- The 24 VDC supply for the module is provided by an 8B0C auxiliary supply module installed on the same mounting plate.

- Connection between S1 and S2 (activation of the external holding brake) using a jumper with a max. length of 10 cm.

If the 24 VDC supply for the module is applied to the mounting plate using an 8BVE expansion module, then the output voltage is reduced because of voltage drops on the expansion cable. In this case, undervoltage monitoring must be disabled.

If jumpers longer than 10 cm are used to connect S1 and S2, then the output voltage is reduced because of voltage drops on the jumpers.

¹⁵⁾ Only 8BCF EnDat 2.2 cables from B&R are permitted to be connected to the encoder interfaces.

¹⁶⁾ An EnDat 2.2 functional safety encoder is required when using ACOPOSmulti SafeMOTION inverter modules! With standard EnDat 2.2 encoders, only the STO, SBC and time-monitored SS1 safety functions are available!

¹⁷⁾ $I_{Encoder}$... Max. power consumption of the connected encoder [A].

¹⁸⁾ This value only applies in its delivered state (SLOT2 of the module is sealed by a slot cover / shield plate). If SLOT2 of the module is not sealed, then the level of protection is reduced to IP10. It is important to note that a 8SCS005.0000-00 shield set (slot cover / shield plate) or plug-in module must always be inserted!

¹⁹⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Expansion modules

Technical data for all modules

DC bus connection

Voltage	
Nominal	750 VDC
Reduction of continuous power depending on an ambient temperature above 40°C	1.25% per °Kelvin
Reduction of continuous power depending on the cooling method	No reduction
Power loss with continuous power	200 W
Design	ACOPOSmulti backplane

24 VDC supply

Input voltage	25 VDC ±1.6%
Design	ACOPOSmulti backplane

Operating conditions

Permitted mounting orientations	
Hanging vertically	Yes
Lying horizontally	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ¹⁾	4000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	III
EN 60529 protection	IP20

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum ²⁾	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

²⁾ Continuous operation at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

8BVE0500HW00.000-1, 8BVE0500HC00.000-1



- For distributing the DC bus power supply and 24 VDC auxiliary supply to multiple mounting plates
- For setting up decentralized units in the ACOPOSmulti drive system
- Output for overload protection

General information	8BVE0500HW00.000-1	8BVE0500HC00.000-1
Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting
Certification		
CE		Yes
cULus		Yes
KC		Yes
DC bus connection	8BVE0500HW00.000-1	8BVE0500HC00.000-1
Continuous power depending on the fuse ¹⁾		
10 A		6 kW ²⁾
20 A		12 kW ²⁾
50 A		30 kW ²⁾
Continuous current depending on the fuse ¹⁾		
10 A		8 A _{eff}
20 A		16 A _{eff}
50 A		40 A _{eff}
Reduction of continuous power depending on the installation elevation		
Starting at 500 m above sea level		10% per 1000 m
Peak current depending on the fuse		
10 A		20 A
20 A		40 A
50 A		100 A
Power loss with continuous power		200 W
24 VDC supply	8BVE0500HW00.000-1	8BVE0500HC00.000-1
Continuous power depending on the fuse ¹⁾		
12 A		240 W ²⁾
30 A		600 W ²⁾
Max. power consumption		5 W + P _{Fan8BOM...} ³⁾
Reduction of continuous power depending on an ambient temperature above 40°C		1.25% per °Kelvin
DC bus cable outlet ⁴⁾	8BVE0500HW00.000-1	8BVE0500HC00.000-1
Quantity		2
Protection		
Type ⁵⁾		2x blow-out fuse Ø 14x51 mm
Tripping characteristic		Ultra fast-acting
Rated current ⁶⁾		10 / 20 / 50 A
Protective measures		
Fuse-dependent overload protection		
10 A		No (overload indicated via LED, dry alarm contacts present)
20 A		No (overload indicated via LED, dry alarm contacts present)
50 A		No (overload indicated via LED, dry alarm contacts present)
Short circuit and ground fault protection		Yes
Max. distance between two expansion modules		5 m
Design		
DC+, DC-, PE		Male connector
Shield connection		Yes
Terminal connection cross section		
Flexible and fine wire lines		
With wire end sleeves		0.5 to 16 mm ²
Approbation data		
UL/C-UL-US		20 to 6
CSA		20 to 6
Terminal cable cross section dimension of shield connection		12 to 22 mm

Expansion modules

8BVE0500HW00.000-1, 8BVE0500HC00.000-1

24 VDC auxiliary supply cable outlet	8BVE0500HW00.000-1	8BVE0500HC00.000-1
Quantity		2
Output voltage		
DC bus voltage (U _{DC}): 260 to 315 VDC		25 VDC * (DC bus voltage / 315)
DC bus voltage (U _{DC}): 315 to 800 VDC		24 VDC ±6%
Protection		
Type ⁷⁾		Blow-out fuse Ø 10x38 mm
Tripping characteristic		Fast-acting
Rated current		12 / 30 A
Protective measures		
Overload protection		Yes
Short circuit protection		Yes
Max. distance between two expansion modules		5 m
Design		
24 VDC, COM		Male connector
Shield connection		No
Terminal connection cross section		
Flexible and fine wire lines		
With wire end sleeves		0.25 to 6 mm ²
Approbation data		
UL/C-UL-US		22 -10
CSA		22 -10
Alarm contacts ⁸⁾	8BVE0500HW00.000-1	8BVE0500HC00.000-1
Quantity		2
Type		
Alarm contact 1		Normally closed contact
Alarm contact 2		Normally open contact
Electrical isolation		
Alarm contact - ACOPOSmulti module		Yes
Alarm contact - Alarm contact		Yes
Nominal voltage		30 VDC
Maximum current		1 A
Switching delay		3 ms
Max. number of switching cycles		100,000
Protection		
Overload protection		No
Short circuit protection		No
Operating conditions	8BVE0500HW00.000-1	8BVE0500HC00.000-1
Permitted mounting orientations		
Lying horizontally		Yes
EN 60529 protection		IP20
Mechanical characteristics	8BVE0500HW00.000-1	8BVE0500HC00.000-1
Dimensions ⁹⁾		
Width		53 mm
Height		317 mm
Depth		
Wall mounting	263 mm	-
Cold plate	-	212 mm
Feed-through mounting	-	209 mm
Weight	Approx. 3.1 kg	Approx. 2.6 kg
Module width		1

8BVE0500HW00.000-1, 8BVE0500HC00.000-1

- ¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.
- ²⁾ The specified values take into consideration a reserve of 17% of the rated current (recommended by the fuse manufacturer).
- ³⁾ P_{Fan8B0M} ... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).
- ⁴⁾ Shielded cables must be used. B&R recommends the ACOPOSmulti 8BCA expansion cables.
- ⁵⁾ For example, a type KLKD0xx fuse from Littelfuse (www.littelfuse.com) may be used (xx is the rated current for the fuse; only fuses with a rated current of 50 A or less may be used).
- ⁶⁾ For a 10 A rated current, type 5011806.10 fuses from Siba (www.sibafuses.com) must be used.
For a 20 A rated current, type 5011806.20 fuses from Siba (www.sibafuses.com) must be used.
For a 50 A rated current, type 5020106.50 fuses from Siba (www.sibafuses.com) must be used.
- ⁷⁾ For example, a type KLKD0xx fuse from Littelfuse (www.littelfuse.com) may be used (xx is the rated current for the fuse; only fuses with a rated current of 30 A or less may be used).
- ⁸⁾ The alarm contacts are only activated in situations that lead to components being overloaded inside the module. The alarm contacts must therefore be monitored externally.
Triggering the DC bus or 24 VDC circuit breaker does not result in components being overloaded inside the module, so an alarm contact is not activated!
The alarm contacts are triggered if:
 - The load on the damping resistors is >100% (OLD LED lights up).
 - The expansion module's outgoing 24 VDC circuit is thermally overloaded (OL24 LED is lit).
 - The expansion module's outgoing DC bus circuit is thermally overloaded (OLDC LED is lit).When activating the alarm contacts, the ACOPOSmulti drive system should be switched off in order to prevent damage to the expansion module.
- ⁹⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  792.

Capacitor modules

Technical data for all modules

DC bus connection

Voltage	
Nominal	750 VDC
Design	ACOPOSmulti backplane

24 VDC supply

Input voltage	25 VDC +1.6% / -20%
Design	ACOPOSmulti backplane

Operating conditions

Permitted mounting orientations	
Hanging vertically	Yes
Lying horizontally	Yes
Standing horizontally	No
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ¹⁾	4000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	III
EN 60529 protection	IP20

Environmental conditions

Temperature	
Operation	
Nominal	5 to 40°C
Maximum ²⁾	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

¹⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

²⁾ Continuous operation at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the specified continuous current reductions into consideration), but this will result in a shorter service life.

8B0K1650HW00.000-1, 8B0K1650HC00.000-1



- For buffering the DC bus
- Seamless integration in the ACOPOSmulti drive system
- Charging circuit

General information	8B0K1650HW00.000-1	8B0K1650HC00.000-1
Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting
Certification		
CE		Yes
cULus		Yes
KC		Yes
DC bus connection	8B0K1650HW00.000-1	8B0K1650HC00.000-1
Power loss at max. device power		In preparation
DC bus capacitance		1650 µF
24 VDC supply	8B0K1650HW00.000-1	8B0K1650HC00.000-1
Max. power consumption		3 W + P _{Fan8B0M...} ¹⁾
Operating conditions	8B0K1650HW00.000-1	8B0K1650HC00.000-1
Permitted mounting orientations		
Lying horizontally		Yes
EN 60529 protection		IP20
Mechanical characteristics	8B0K1650HW00.000-1	8B0K1650HC00.000-1
Dimensions ²⁾		
Width		53 mm
Height		317 mm
Depth		
Wall mounting	263 mm	-
Cold plate	-	212 mm
Feed-through mounting	-	209 mm
Weight	Approx. 3.2 kg	Approx. 2.7 kg
Module width		1

¹⁾ P_{Fan8B0M...} ... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

²⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Capacitor modules

8B0K3630HW00.001-1, 8B0K3630HC00.001-1



- For buffering the DC bus
- Seamless integration in the ACOPOSmulti drive system
- Charging circuit

General information	8B0K3630HW00.001-1	8B0K3630HC00.001-1
Cooling and mounting method	Wall mounting	Cold plate or feed-through mounting
Certification		
CE		Yes
cULus		Yes
Maximum number of modules depends on the power supply module		
8B0P0xx0		In preparation
8BVP0220		In preparation
8BVP0440		In preparation
8BVP0880		In preparation
8BVP1650		In preparation
Startup time (CR_OK In HIGH to CR_OK Out HIGH)		Typical 500 ms
Cutoff delay (CR_OK In LOW to CR_OK Out LOW)		Typ. 3 ms
Power mains connection	8B0K3630HW00.001-1	8B0K3630HC00.001-1
Switch-on interval		
Mains input voltage 3x 400 VAC		In preparation
Mains input voltage 3x 480 VAC		In preparation
DC bus connection	8B0K3630HW00.001-1	8B0K3630HC00.001-1
Voltage		
Minimum		235 VDC
Power loss at max. device power		In preparation
DC bus capacitance		3630 μ F ¹⁾
24 VDC supply	8B0K3630HW00.001-1	8B0K3630HC00.001-1
Input capacitance		28.2 μ F
Max. power consumption		8 W + P _{Fan8B0M...} ²⁾
Alarm contacts ³⁾	8B0K3630HW00.001-1	8B0K3630HC00.001-1
Quantity		2
Type		
Alarm contact 1		Normally closed contact
Alarm contact 2		Normally open contact
Electrical isolation		
Alarm contact - ACOPOSmulti module		Yes
Alarm contact - Alarm contact		Yes
Nominal voltage		30 VDC
Maximum current		1 A
Switching delay ⁴⁾		Max. 5 ms
Max. number of switching cycles		100,000
Protection		
Overload protection		No
Short circuit protection		No
Operating conditions	8B0K3630HW00.001-1	8B0K3630HC00.001-1
Permitted mounting orientations		
Lying horizontally		Yes
EN 60529 protection		IP20

8B0K3630HW00.001-1, 8B0K3630HC00.001-1

Mechanical characteristics	8B0K3630HW00.001-1	8B0K3630HC00.001-1
Dimensions ⁵⁾		
Width		106.5 mm
Height		317 mm
Depth		
Wall mounting	263 mm	-
Cold plate	-	212 mm
Feed-through mounting	-	209 mm
Weight	6.4 kg	5.1 kg
Module width		2

¹⁾ May not be taken into consideration when determining the maximum chargeable DC bus capacitance of ACOPOSmulti drive systems!

²⁾ $P_{Fan8B0M...}$... Portion of the power [W] that is used by the fan modules in the mounting plate or the 8B0M0040HFF0.000-1 fan module (see the technical data for the respective 8B0M... mounting plate / 8B0M0040HFF0.000-1 fan module).

³⁾ B&R recommends monitoring the alarm contacts. This way, if the module cannot be started up, it is possible to check whether it is functioning properly and is cabled correctly.

⁴⁾ Switching delay after a change of state in CR_OK Out.

⁵⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

For technical data relevant to all modules, see  796.

Plug-in modules

Technical data for all modules

Environmental conditions

Temperature

Operation

Nominal

5 to 40°C

Maximum

55°C

Storage

-25 to 55°C

Transport

-25 to 70°C

Relative humidity

Operation

5 to 85%

Storage

5 to 95%

Transport

Max. 95% at 40°C

8BAC0120.000-1



- EnDat 2.1 encoder interface for installation in ACOPOSmulti modules
- Encoder monitoring
- High-precision analog signal processing
- Embedded parameter chip when used with B&R motors

General information

Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Power consumption	
Depends on the encoder connected	Yes
E0 ... EnDat single-turn, 512 lines	Max. 4 W
E1 ... EnDat multi-turn, 512 lines	Max. 4 W
E2 ... EnDat single-turn, 32 lines (inductive)	Max. 4 W
E3 ... EnDat multi-turn, 32 lines (inductive)	Max. 4 W
E4 ... EnDat single-turn, 512 lines	Max. 4 W
E5 ... EnDat multi-turn, 512 lines	Max. 4 W
Certification	
CE	Yes
cULus	Yes
KC	Yes

Encoder inputs ²⁾

Quantity	1
Module-side connection	15-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	No
Encoder monitoring	Yes
Max. encoder cable length	75 m
Sine/Cosine inputs	
Signal transmission	Differential signals, symmetrical
Signal frequency (-3 dB)	DC up to 300 kHz
Signal frequency (-5 dB)	DC up to 400 kHz
Common-mode voltage	Max. ±7 V
Terminating resistors	120 Ω
Resolution	12-bit

Encoder supply

Output voltage	5 V ±5%
Load capability	250 mA ³⁾
Sense lines	2, compensation of max. 2x 0.7 V

Position

Resolution @ 1 V _{SS} ⁴⁾	Number of encoder lines * 5700
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Synchronous serial interface

Data transfer rate	781.25 kbit/s
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¹⁾ The 8BAC0120.000-1 is a single encoder module. Up to two encoder modules can be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis, and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes if only one axis is being operated.

²⁾ The EnDat encoder must be wired using a cable with a single shielding layer.

³⁾ An additional reserve of 57 mA exists for terminating resistors.

⁴⁾ This value does not correspond to the encoder resolution that must be configured in Automation Studio (16384 * number of encoder lines).

8BAC0120.001-2



- EnDat 2.2 encoder interface for installation in ACOPOSmulti modules
- Encoder monitoring
- Embedded parameter chip when used with B&R motors

General information

Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption	$P_{\text{Module}} [\text{mW}] = 500 \text{ mW} + 19 \text{ V} * I_{\text{Encoder}} [\text{mA}]$ ²⁾
Certification	
CE	Yes
cULus	Yes
KC	Yes

Encoder connection ³⁾

Module-side connection	9-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	No
Encoder monitoring	Yes
Max. encoder cable length	100 m
	Depends on the cross section of the encoder's supply wires ⁴⁾

Encoder supply

Output voltage	Typ. 12.5 V
Load capability	350 mA
Protective measures	
Overload protection	Yes
Short circuit protection	Yes

Synchronous serial interface

Baud rate	6.25 Mbit/s
-----------	-------------

¹⁾ The 8BAC0120.001-2 is an encoder module. Two encoder modules can also be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis, and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes if only one axis is being operated.

²⁾ I_{encoder} ... Power consumption of the EnDat 2.2 encoder. The current consumption for the terminating resistors is already included in the formula.

³⁾ Only 8BCF EnDat 2.2 cables from B&R may be used to connect the module.

⁴⁾ The maximum encoder cable length l_{max} can be calculated as follows (the maximum permissible encoder cable length of 100 m must not be exceeded):

$$I_{\text{max}} = 7.9 I_G * A * 1 / (2 * \rho)$$

I_G ... Max. current consumption of the encoder [A].

A ... Cross section of the supply wire [mm²].

ρ ... Specific resistance [Ω mm²/m] (e.g. for copper: $\rho = 0.0178$).

8BAC0121.000-1



- HIPERFACE interface for installation in ACOPOSmulti modules
- Encoder monitoring
- High resolution

General information

Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption	$P_{\text{Module}} [\text{mW}] = 25 \text{ V} * (I_{\text{Encoder}} [\text{mA}] * 0.48 + 50 \text{ mA})$
Certification	
CE	Yes
cULus	Yes
KC	Yes

Encoder connection ²⁾

Module-side connection	15-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	No
Encoder monitoring	Yes
Max. encoder cable length	75 m

Encoder inputs

Quantity	1
Sine/Cosine inputs	
Signal transmission	Differential signal, asymmetrical
Signal frequency	DC up to 200 kHz
Common-mode voltage	Max. $\pm 7 \text{ V}$
Terminating resistors	120 Ω
Resolution	12-bit

Encoder supply

Output voltage	Typ. 10 V
Load capability	130 mA ³⁾
Sense lines	- ⁴⁾
Protective measures	
Overload protection	Yes
Short circuit protection	Yes

Position

Resolution @ 1 V _{SS} ⁵⁾	Number of encoder lines * 5700
--	--------------------------------

Asynchronous serial interface

Signal transmission	RS485
Data transfer rate	9600 bit/s

¹⁾ The 8BAC0121.000-1 is an encoder module. Up to two encoder modules can be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis, and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes if only one axis is being operated.

²⁾ The HIPERFACE encoder must be wired using a cable with a single shielding layer.

³⁾ An additional reserve of 40 mA exists for terminating resistors.

⁴⁾ No sense lines are present since the supply voltage for the HIPERFACE encoder is permitted to be between 7 and 12 V.

⁵⁾ This value does not correspond to the encoder resolution that must be configured in Automation Studio (16384 * number of encoder lines).

Plug-in modules

8BAC0122.000-1



- Resolver interface for installation in ACOPOSmulti modules
- Encoder monitoring
- High resolution

General information

Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption	1 W
Certification	
CE	Yes
cULus	Yes
KC	Yes

Encoder connection ²⁾

Module-side connection	9-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	No
Encoder monitoring	Yes
Max. encoder cable length	100 m

Encoder supply

Output voltage	Typ. 3 V _{eff}
Output current	Max. 50 mA _{eff}
Frequency	10 kHz
Protective measures	
Overload protection	Yes
Short circuit protection	Yes

Position

Resolution @ $\dot{u} = 0.5$	Number of pole pairs * 22600
------------------------------	------------------------------

Analog inputs

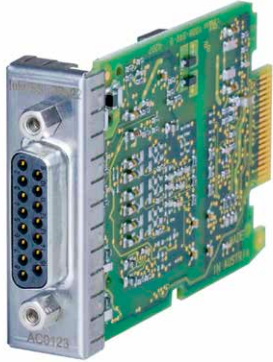
Digital converter resolution	14-bit
Input impedance	10.4 k Ω - j 11.1 k Ω
Input voltage	Resolver transformation ratio: 0.5 \pm 10% ³⁾
Common-mode voltage	Max. \pm 20 V
Signal transmission	Differential signals

¹⁾ The 8BAC0122.000-1 is an encoder module. Two encoder modules can also be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis, and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes if only one axis is being operated.

²⁾ The resolver must be wired using a cable with a single shield and twisted pair signal lines.

³⁾ Starting with firmware V2.040, the nominal gear ratio can be configured in the range 0.3 ... 0.5 (default value). Starting with firmware V2.230, the nominal gear ratio can be configured in the range 0.2 ... 0.5 (default value).

8BAC0123.000-1



- Incremental encoder and SSI absolute encoder interface for installation in ACOPOSmulti modules
- Evaluation of incremental/SSI encoders with output signals in accordance to RS422
- Encoder monitoring
- Encoder supply +5 V and +24 V
- Connection for temperature sensor
- Evaluation of tracer pins possible

General information

Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption	
Encoder supply 5 V	$P_{\text{Module}} [\text{mW}] = 25 \text{ V} * ((I_{\text{Encoder}} [\text{mA}] * 0.42) + 0.45)$ ²⁾
Encoder supply 24 V	$P_{\text{Module}} [\text{mW}] = 25 \text{ V} * (I_{\text{Encoder}} [\text{mA}] + 0.45)$ ³⁾
Certification	
CE	Yes
cULus	Yes
KC	Yes

Encoder connection ⁴⁾

Module-side connection	15-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	Yes
Encoder monitoring	Yes
Max. encoder cable length	100 m

Encoder supply 5 V

Output voltage	5 V \pm 5%
Load capability	350 mA ⁵⁾
Sense lines	
Quantity	2
Max. compensation	2x 1.5 V
Protective measures	
Overload protection	Yes
Short circuit protection	Yes

Encoder supply 24 V

Output voltage	24 V \pm 10%
Load capability	300 mA ⁶⁾
Sense lines	No
Protective measures	
Overload protection	Yes
Short circuit protection	Yes

Inputs A, B, R, D

Signal transmission	RS422
Differential voltage	\pm 0.5 V to \pm 7 V ⁷⁾
Common-mode voltage	-10 to +13 V
Terminating resistors	120 Ω (difference)

Incremental encoder operation

Signal form	Square wave pulse
Evaluation	4x
Input frequency ⁸⁾	Max. 50 / 100 / 200 / 400 kHz
Counter frequency	Max. 200 / 400 / 800 / 1600 kHz
Reference frequency	Max. 50 / 100 / 200 / 400 kHz
Distance between edges ⁹⁾	Min. 1.3 / 0.7 / 0.4 / 0.2 μ s

8BAC0123.000-1

SSI absolute encoder operation

Keying	Gray, binary
Baud rate	390 kbaud
Word size	Max. 31-bit
Differential voltage	Typ. 2.5 V

¹⁾ The 8BAC0123.000-1 is an encoder module. Two encoder modules can also be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis, and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes if only one axis is being operated.

²⁾ I_{Encoder} ... Current consumption of the incremental encoder The current consumption for the terminating resistors is already included in the formula. A voltage drop on the encoder cable of max. 2x 1.5 V is also taken into consideration.

³⁾ I_{Encoder} ... Current consumption of the incremental encoder The current consumption for the terminating resistors is already included in the formula.

⁴⁾ The encoder must be wired using a cable with a single shield and twisted pair signal lines (e.g. 4x 2x 0.14 mm² + 2x 0.5 mm²).

⁵⁾ An additional reserve of 60 mA is available for terminating resistors.

⁶⁾ An additional reserve of 25 mA is available for terminating resistors.

⁷⁾ With open line monitoring disabled, ± 0.2 V is sufficient.

⁸⁾ Input filter configurable using software.

⁹⁾ Automatically adjusted to the selected input filter.

8BAC0123.001-1



- Incremental encoder interface for installation in ACOPOSmulti modules
- Evaluation of incremental encoders with push, pull or push-pull outputs with no complementary signal
- Evaluation of incremental encoders with symmetrical push-pull outputs that cannot handle such high loads
- Encoder supply +5 V
- Connection for temperature sensor

General information

Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption ²⁾	$P_{\text{Module}} [\text{mW}] = 25 \text{ V} * (I_{\text{Encoder}} [\text{mA}] * 0.42 + 48 \text{ mA})$
Certification	
CE	Yes
cULus	Yes
KC	Yes

Encoder connection ³⁾

Module-side connection	15-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	Yes
Max. encoder cable length	
Incremental encoder	25 m

Encoder supply 5 V

Output voltage	5 V \pm 5%
Load capability	350 mA ⁴⁾
Sense lines	
Quantity	2
Max. compensation	2x 1.5 V
Protective measures	
Overload protection	Yes
Short circuit protection	Yes

Inputs A, B, R

Single-ended signals	
Input voltage for low	<1.0 V (to COM)
Input voltage for high	>2.4 V (to COM)
Maximum input voltage	-10 V / +13 V (to COM)
Differential signals	
Differential voltage	$\pm 0.8 \text{ V}$ to $\pm 23 \text{ V}$ ⁵⁾
Maximum input voltage	-10 V / +13 V (to COM)
Input resistance	See block diagram

Incremental encoder operation

Signal form	Square wave pulse
Evaluation	4x
Input frequency ⁶⁾	Max. 25 / 50 / 100 / 200 kHz
Counter frequency	Max. 100 / 200 / 400 / 800 kHz
Reference frequency	Max. 25 / 50 / 100 / 200 kHz
Distance between edges ⁷⁾	Min. 2.6 / 1.3 / 0.7 / 0.4 μ s

¹⁾ The 8BAC0123.001-1 is an encoder module. Two encoder modules can also be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis, and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes if only one axis is being operated.

²⁾ I_{Encoder} ... Current consumption of the incremental encoder. The current consumption for the terminating resistors is already included in the formula. A voltage drop on the encoder channel of max. 2x 1.5 V is also taken into consideration.

³⁾ The encoder must be wired using a cable with a single shield and twisted pair signal lines (e.g. 4x 2x 0.14 mm² + 2x 0.5 mm²).

⁴⁾ An additional reserve of 60 mA is available for terminating resistors.

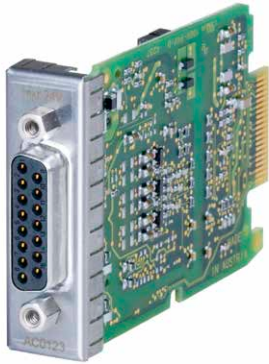
⁵⁾ With open line monitoring disabled, $\pm 0.5 \text{ V}$ is sufficient.

⁶⁾ Input filter configurable using software.

⁷⁾ Automatically adjusted to the selected input filter.

Plug-in modules

8BAC0123.002-1



- Incremental encoder interface for installation in ACOPOSmulti modules
- Evaluation of incremental encoders with push, pull or push-pull outputs with no complementary signal
- Evaluation of incremental encoders with symmetrical push-pull outputs
- Evaluation of tracer pins or other similar rapid sensors with digital output
- Encoder supply +24 V
- Connection for temperature sensor

General information

Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption ²⁾	$P_{\text{Module}} [\text{mW}] = 25 \text{ V} * (I_{\text{Encoder}} [\text{mA}] + 60 \text{ mA})$
Certification	
CE	Yes
cULus	Yes
KC	Yes

Encoder connection ³⁾

Module-side connection	15-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	Yes
Max. encoder cable length	25 m

Encoder supply 24 V

Output voltage	24 V \pm 10%
Load capability	300 mA ⁴⁾
Sense lines	-
Protective measures	
Overload protection	Yes
Short circuit protection	Yes

Inputs A, B, R

Single-ended signals	
Input voltage for low	<5.5 V (to COM)
Input voltage for high	>14 V (to COM)
Maximum input voltage	-15 V / +30 V (to COM)
Differential signals	
Differential voltage	\pm 4 V to \pm 30 V ⁵⁾
Maximum input voltage	-15 V / +30 V (to COM)
Input resistance	See block diagram

Incremental encoder operation

Signal form	Square wave pulse
Evaluation	4x
Input frequency ⁶⁾	Max. 25 / 50 / 100 / 200 kHz
Counter frequency	Max. 100 / 200 / 400 / 800 kHz
Reference frequency	Max. 25 / 50 / 100 / 200 kHz
Distance between edges ⁷⁾	Min. 2.6 / 1.3 / 0.7 / 0.4 μ s

¹⁾ The 8BAC0123.002-1 is an encoder module. Two encoder modules can also be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis, and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes if only one axis is being operated.

²⁾ I_{Encoder} ... Current consumption of the incremental encoder. The current consumption for the terminating resistors is already included in the formula.

³⁾ The encoder must be wired using a cable with a single shield and twisted pair signal lines (e.g. 4x 2x 0.14 mm² + 2x 0.5 mm²).

⁴⁾ An additional reserve of 25 mA is available for terminating resistors.

⁵⁾ With open line monitoring disabled, \pm 2.5 V is sufficient.

⁶⁾ Input filter configurable using software.

⁷⁾ Automatically adjusted to the selected input filter.

8BAC0124.000-1



- SinCos interface for installation in ACOPOSmulti modules
- Evaluation of incremental encoders with sinusoidal output signal
- Encoder supply +5 V
- Connection for limit switches
- Connection for temperature sensor

General information

Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption	$P_{\text{Module}} [\text{mW}] = 25 \text{ V} * (I_{\text{Encoder}} [\text{mA}] * 0.37 + 32 \text{ mA})$
Certification	
CE	Yes
cULus	Yes
KC	Yes

Encoder connection ²⁾

Module-side connection	15-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	No
Encoder monitoring	Yes
Max. encoder cable length	75 m

Encoder inputs

Quantity	1
Sine/Cosine inputs	
Signal transmission	Differential signals, symmetrical
Signal frequency (-3 dB)	DC up to 300 kHz
Signal frequency (-5 dB)	DC up to 400 kHz
Common-mode voltage	Max. $\pm 7 \text{ V}$
Terminating resistors	120 Ω
Resolution	12-bit

Encoder supply

Output voltage	5 V $\pm 5\%$
Load capability	300 mA ³⁾
Sense lines	2, compensation of max. 2x 0.7 V
Protective measures	
Overload protection	Yes
Short circuit protection	Yes

Reference input

Signal transmission	Differential signal, symmetrical
Differential voltage for low	$\leq -0.2 \text{ V}$
Differential voltage for high	$\geq +0.2 \text{ V}$
Common-mode voltage	Max. $\pm 7 \text{ V}$
Terminating resistors	120 Ω

Plug-in modules

8BAC0124.000-1

Position

Resolution @ 1 V _{SS} ⁴⁾	Number of encoder lines * 5700
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Limit switch inputs ⁵⁾

Quantity	2
----------	---

Wiring	Source
--------	--------

Input resistance	1470 Ω
------------------	--------

Electrical isolation

Input - ACOPOSmulti	No
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Input - Input	No
---------------	----

Input voltage

Minimum	-12 V
---------	-------

Nominal	+5 V
---------	------

Maximum	+20 V
---------	-------

Switching threshold

Low	<0.8 V
-----	--------

High	>2 V
------	------

Switching delay	Max. 100 μs
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¹⁾ The 8BAC0124.000-1 is an encoder module. Up to two encoder modules can be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis, and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes if only one axis is being operated.

²⁾ The encoder must be wired using a cable with a single shield and twisted pair signal lines.

³⁾ An additional reserve of 12 mA exists for terminating resistors and limit switch inputs.

⁴⁾ This value does not correspond to the encoder resolution that must be configured in Automation Studio (16384 * number of encoder lines).

⁵⁾ The measurement system offered by Heidenhain with limit switch outputs LIDA 47x, LIDA 48x and LIF4x1 was tested for compatibility. In practice, the cable length is limited by the encoder.

8BAC0125.000-1



- Interface for evaluating sinusoidal output signals
- Functions and protocols selected through configuration (using a higher-level controller)
 - SSI
 - SSI with evaluation of sinusoidal output signals
 - EnDat 2.1
 - BiSS

General information

Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption	$P_{\text{Module}} [\text{mW}] = 25 \text{ V} * (I_{\text{Encoder}} [\text{mA}] * 0.4 + 25 \text{ mA})$
Certification	
CE	Yes
cULus	Yes

Encoder inputs ²⁾

Quantity	1
Module-side connection	15-pin female DSUB connector
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	No
Encoder monitoring	Yes
Max. encoder cable length	75 m
Sine/Cosine inputs	
Signal transmission	Differential signals, symmetrical
Signal frequency (-3 dB)	DC up to 300 kHz
Signal frequency (-5 dB)	DC up to 400 kHz
Common-mode voltage	Max. $\pm 7 \text{ V}$
Terminating resistors	120 Ω
Resolution	12-bit

Encoder supply

Output voltage	5 V $\pm 5\%$
Load capability	250 mA ³⁾
Sense lines	2, compensation of max. 2 x 0.7 V

Position

Resolution @ 1 V _{SS}	Number of encoder lines * 5700
--------------------------------	--------------------------------

Synchronous serial interface

Data transfer rate	Depends on the configured functionality ⁴⁾
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¹⁾ The 8BAC0125.000-1 is a single encoder module. Up to two encoder modules can be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis, and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes if only one axis is being operated.

²⁾ The encoder must be wired using a cable with a single shielding layer.

³⁾ An additional reserve of 57 mA exists for terminating resistors.

⁴⁾ EnDat 2.1 ... 781.25 kbit/s; SSI ... 100 to 400 kbit/s; BiSS ... 1560 kbit/s.

For technical data relevant to all modules, see  800.

Plug-in modules

8BAC0130.000-1



- Digital mixed module for installation in ACOPOSmulti modules
- 2 inputs, +24 VDC
- 2 high-speed outputs, +24 VDC
- 2 standard readable outputs, +24 VDC

General information

Module type	ACOPOSmulti plug-in module
Slot	Slot 2
Max. power consumption	800 mW
Certification	
CE	Yes
cULus	Yes
KC	Yes

Module connection

Module-side connection	10-pin connector
Status indicators	UP LED (module OK) and DN LED (module NOT OK)

Digital inputs

Quantity	2
Modulation compared to ground potential	Max. 30 V
Wiring	Sink
Input current at nominal voltage	Approx. 11 mA
Input voltage	
Nominal	24 VDC
Electrical isolation	
Input - Input	No
Input - ACOPOSmulti	Yes

Digital outputs ¹⁾

Quantity	4
Readable outputs	Yes
Continuous current	
Outputs 1 - 2	Max. 50 mA
Outputs 3 - 4	Max. 500 mA
Short circuit current at 24 V (until cutoff)	
Outputs 1 - 2	Approx. 0.2 A
Outputs 3 - 4	Approx. 1.2 A
Electrical isolation	
Output - ACOPOSmulti	Yes
Output - Output	No
Switching frequency (resistive load)	
Outputs 1 - 2	Max. 62.5 kHz
Outputs 3 - 4	Max. 1.25 kHz
Switching voltage	
Minimum	18 VDC
Nominal	24 VDC
Maximum	30 VDC
Switching delay 0 -> 1 and 1 -> 0	
Outputs 1 - 2	Max. 1 µs
Outputs 3 - 4	Max. 50 µs
Type	
Outputs 1 - 2	Push-pull
Outputs 3 - 4	High-side
Modulation compared to ground potential	
Outputs 3 - 4	Max. 30 V

¹⁾ Shielded cables must be used for outputs 1 and 2.

8BAC0130.001-1



- Digital output module for installation in ACOPOSMulti modules
- 2 high-speed outputs, +24 VDC
- 2 standard readable outputs, +24 VDC

General information

Module type	ACOPOSMulti plug-in module
Slot	Slot 2
Max. power consumption	800 mW
Certification	
CE	Yes
cULus	Yes
KC	Yes

Module connection

Module-side connection	10-pin connector
Status indicators	UP LED (module OK) and DN LED (module NOT OK)

Digital inputs

Quantity	2
Modulation compared to ground potential	Max. 30 V
Wiring	Sink
Input current at nominal voltage	Approx. 11 mA
Input voltage	
Nominal	24 VDC
Electrical isolation	
Input - Input	No
Input - ACOPOSMulti	Yes

Digital outputs ¹⁾

Quantity	6
Readable outputs	Yes
Continuous current	
Outputs 1 - 2	Max. 50 mA
Outputs 3 - 6	Max. 500 mA
Short circuit current at 24 V (until cutoff)	
Outputs 1 - 2	Approx. 0.2 A
Outputs 3 - 6	Approx. 1.2 A
Electrical isolation	
Output - ACOPOSMulti	Yes
Output - Output	No
Switching frequency (resistive load)	
Outputs 1 - 2	Max. 62.5 kHz
Outputs 3 - 6	Max. 1.25 kHz
Switching voltage	
Minimum	18 VDC
Nominal	24 VDC
Maximum	30 VDC
Switching delay 0 -> 1 and 1 -> 0	
Outputs 1 - 2	Max. 1 µs
Outputs 3 - 6	Max. 50 µs
Type	
Outputs 1 - 2	Push-pull
Outputs 3 - 6	High-side
Modulation compared to ground potential	
Outputs 3 - 6	Max. 30 V

¹⁾ Shielded cables must be used for outputs 1 and 2.

Plug-in modules

8BAC0132.000-1



- Analog input module for installation in ACOPOSmulti modules
- 4 high-speed analog inputs ± 10 V

General information

Module type	ACOPOSmulti plug-in module
Slot	Slots 1 and 2
Max. power consumption	1.2 W
Certification	
CE	Yes
cULus	Yes
KC	Yes

Module connection

Module-side connection	10-pin connector
Status indicators	UP LED (module OK) and DN LED (module NOT OK)

Analog inputs

Quantity	4
Digital converter resolution	14-bit
Conversion time	<10 μ s
Design	Differential input
Electrical isolation	
Input - ACOPOSmulti	Yes
Input - Input	No
Input signal	
Nominal	-10 to +10 V
Maximum	-15 to +15 V
Operating modes	Cyclic measurement synchronous to 50 μ s clock
Differential input impedance	>10 M Ω

8BAC0133.000-1



- Encoder emulation module for installation in ACOPOSmulti modules
- 3 RS422 outputs
- ABR encoder emulation

General information

Module type	ACOPOSmulti plug-in module
Slot	Slot 2
Power consumption	Max. 2 W
Certification	
CE	Yes
cULus	Yes

Module connection

Module-side connection	9-pin female DSUB connector, keyed
Status indicators	UP LED (module OK) and DN LED (module NOT OK)
Max. cable length	75 m
Terminating resistors	120 Ω

Digital outputs

Quantity	3
Switching frequency	Max. 1 MHz
Type	RS422 (differential)
Output status dependent on operating state	High resistance, until the software is initialized
Electrical isolation	
Output - ACOPOSmulti	Yes
Output - Output	No

For technical data relevant to all modules, see [800](#).

Braking resistors

Features

- Compact design
- High peak load capacity
- Intrinsically safe
- Optimally suited for B&R drive systems

Technical data for all modules

Operating conditions

Permitted mounting orientations

Standing horizontally

Yes

Environmental conditions

Relative humidity

Operation

5 to 95%

Technical data



8B0W0045H000.000-1

8B0W0079H000.000-1

8B0W0045H000.001-1

8B0W0079H000.001-1

General information

RoHS-compliant	Yes
Cooling and mounting method	Wall mounting
Certification	
CE	Yes
cULus	Yes
KC	Yes

Braking resistors

Continuous power depending on the mounting orientation

	8B0W0045H000.000-1	8B0W0079H000.000-1	8B0W0045H000.001-1	8B0W0079H000.001-1
Standing horizontally	388 W	636 W	388 W	636 W
Hanging vertically	424 W	701 W	424 W	701 W
Reduction of continuous power depending on ambient temperature	7.5 W/K (from 40°C)	13.2 W/K (from 40°C)	7.5 W/K (from 40°C)	13.2 W/K (from 40°C)
Ohmic resistance	50 Ω ±10%	33 Ω ±10%	50 Ω ±10%	33 Ω ±10%
Max. operating voltage	850 VDC			
Isolation voltage type test	4000 VAC			
Intrinsically safe	Yes ¹⁾			
Design	Terminals with tension spring technology			
RB1, RB2				
PE	M5 threaded bolt		M4 threaded bolt	
Shield connection	Yes, on the terminal box via high-strength cable gland			
Terminal connection cross section				
Flexible and fine wire lines				
With wire end sleeves	1.5 to 10 mm ²			
Approbation data				
UL/C-UL-US	24 to 6			
CSA	22 to 6			
Terminal cable outer-cross-section dimension of the attachment cable	9 to 16.6 mm			

Temperature model data

Thermal resistance between braking resistor and the environment depending on the mounting orientation

	8B0W0045H000.000-1	8B0W0079H000.000-1	8B0W0045H000.001-1	8B0W0079H000.001-1
Standing horizontally	1.657 K/W	0.9395 K/W	1.657 K/W	0.9395 K/W
Hanging vertically	1.517 K/W	0.852 K/W	1.517 K/W	0.852 K/W
Thermal capacity	30.88 Ws/K	40.68 Ws/K	30.88 Ws/K	40.68 Ws/K
Max. permissible overtemperature	683°C	637°C	683°C	637°C

Technical data

8B0W0045H000.000-1

8B0W0079H000.000-1

8B0W0045H000.001-1

8B0W0079H000.001-1

Operating conditions

Permitted mounting orientations

Hanging vertically			
Connection box, bottom		Yes	
Connection box, top		No	
EN 60529 protection			
Standing horizontally	IP20		IP65
Hanging vertically			
Connection box, bottom	IP21		-
Connection box, top		-	

Environmental conditions

Temperature

Operation	-40 to 90°C
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Mechanical characteristics

Dimensions

Width	124 mm		
Height	121 mm		
Depth	403 mm	603 mm	332 mm
Weight	2.4 kg	3.9 kg	2.4 kg
			532 mm
			3.9 kg

¹⁾ 8B0W external braking resistors can be considered intrinsically safe if they are connected to a 8B0P passive power supply module operated with a mains supply voltage of 3x 380 - 500 VAC. The maximum time until the 8B0W external braking resistors are damaged is approximately 5.5 min in this case; a maximum surface temperature of approximately 480°C is achieved when this happens. A lower mains supply voltage on the 8B0P passive power supply module allows a longer maximum time before the 8B0W external braking resistor is damaged, which also results in higher temperatures.

For technical data relevant to all modules, see  816.

0.75 mm² motor cables

Technical data



8BCM0005.1011A-0

8BCM0007.1011A-0

8BCM0010.1011A-0

8BCM0015.1011A-0

8BCM0020.1011A-0

8BCM0025.1011A-0

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064					
Certification						
CE						Yes
cULus						Yes

Cable construction

Power lines						
Quantity	4					
Wire colors	Black, brown, blue, yellow/green					
Design	Tinned copper stranded wire					
Diameter	0.75 mm ²					
Shield	No					
Signal lines						
Quantity	4					
Wire colors	White, white/red, white/blue, white/green					
Design	Tinned copper stranded wire					
Diameter	0.35 mm ²					
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding					
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film					
Outer sheathing						
Material	PUR					

Connector

Type	Male motor connector, 8-pin female speedtec connector					
EN 60529 protection	IP67 when connected					

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type						
Wall mounting	13 A					
Installed in conduit or cable duct	11.5 A					
Installed in cable tray	13.5 A					

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	10.9 mm ±0.4 mm					
Flex radius						
Single bend	>34 mm					
Moving	≥85 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	0.98 kg	1.32 kg	1.83 kg	2.68 kg	3.53 kg	4.38 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 125 mm.

1.5 mm² motor cables

Technical data



8BCM0005.1111A-0

8BCM0007.1111A-0

8BCM0010.1111A-0

8BCM0015.1111A-0

8BCM0020.1111A-0

8BCM0025.1111A-0

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	1.5 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	White, white/red, white/blue, white/green
Design	Tinned copper stranded wire
Diameter	0.75 mm ²
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR

Connector

Type	Male motor connector, 8-pin female speedtec connector
EN 60529 protection	IP67 when connected

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	20 A
Installed in conduit or cable duct	17.8 A
Installed in cable tray	20.9 A

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	12.8 mm ±0.4 mm					
Flex radius						
Single bend	>40 mm					
Moving	≥99 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	1.44 kg	1.98 kg	2.74 kg	4.1 kg	5.28 kg	6.5 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 125 mm.

4 mm² motor cables

Technical data



8BCM0005.1312A-0

8BCM0007.1312A-0

8BCM0010.1312A-0

8BCM0015.1312A-0

8BCM0020.1312A-0

8BCM0025.1312A-0

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	4 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	White, white/red, white/blue, white/green
Design	Tinned copper stranded wire
Diameter	1 mm ²
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR

Connector

Type	Male motor connector, 8-pin female speedtec connector
EN 60529 protection	IP67 when connected

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	36.4 A
Installed in conduit or cable duct	31.9 A
Installed in cable tray	38.2 A

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	15.8 mm ±0.5 mm					
Flex radius						
Single bend	>50 mm					
Moving	≥122 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	2.22 kg	3.12 kg	4.46 kg	6.7 kg	9 kg	11.2 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 155 mm.

4 mm² motor cables with size 1.5 motor connector

Technical data



8BCM0005.1322A-0

8BCM0007.1322A-0

8BCM0010.1322A-0

8BCM0015.1322A-0

8BCM0020.1322A-0

8BCM0025.1322A-0

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	4 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	White, white/red, white/blue, white/green
Design	Tinned copper stranded wire
Diameter	1 mm ²
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR

Connector

Type	Male motor connector, 8-pin female speedtec connector, size 1.5
EN 60529 protection	IP67 when connected

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	36.4 A
Installed in conduit or cable duct	31.9 A
Installed in cable tray	38.2 A

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	15.8 mm ±0.5 mm					
Flex radius						
Single bend	>50 mm					
Moving	≥122 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	2.56 kg	3.4 kg	4.8 kg	7 kg	9.3 kg	11.5 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 155 mm.

10 mm² motor cables

Technical data



8BCM0005.1523A-0

8BCM0007.1523A-0

8BCM0010.1523A-0

8BCM0015.1523A-0

8BCM0020.1523A-0

8BCM0025.1523A-0

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064					
Certification						
CE						Yes
cULus						Yes

Cable construction

Power lines						
Quantity						4
Wire colors						Black, brown, blue, yellow/green
Design	Tinned copper litz wire					Tinned copper stranded wire
Diameter						10 mm ²
Shield						No
Signal lines						
Quantity						4
Wire colors						White, white/red, white/blue, white/green
Design						Tinned copper stranded wire
Diameter						1.5 mm ²
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding					
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film					
Outer sheathing						
Material						PUR

Connector

Type	Male motor connector, 8-pin female speedtec connector, size 1.5					
EN 60529 protection						IP67 when connected

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type						
Wall mounting						64.6 A
Installed in conduit or cable duct						54.6 A
Installed in cable tray						68.3 A

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	20.1 mm ±0.7 mm					
Flex radius						
Single bend						>62 mm
Moving						≥156 mm
Drag chain data						
Acceleration						<60 m/s ²
Flex cycles ¹⁾						≥3,000,000
Speed						≤4 m/s
Weight	4.47 kg	6 kg	8.3 kg	12.3 kg	16 kg	19.45 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 200 mm.

10 mm² motor cables with ring connectors

Technical data



8BCM0005.1525B-0

8BCM0007.1525B-0

8BCM0010.1525B-0

8BCM0015.1525B-0

8BCM0020.1525B-0

8BCM0025.1525B-0

General information

Note	Assembly of the power line connection on the server using an M8 ring connector
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	10 mm ²
Shield	No
Stranding	No

Connector

Type	Male motor connector, 8-pin female speedtec connector, size 1.5
EN 60529 protection	IP67 when connected

Electrical characteristics

Test voltage	
Wire/Wire	3 kV
Wire/Shield	3 kV
Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	64.6 A
Installed in conduit or cable duct	54.6 A
Installed in cable tray	68.3 A

Environmental conditions

Temperature	
Moving	-10 to 80°C
Static	-40 to 90°C

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	20.1 mm ±0.7 mm					
Flex radius						
Single bend	>62 mm					
Moving	≥156 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	4.47 kg	6 kg	8.3 kg	12.3 kg	16 kg	19.45 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 200 mm.

1.5 mm² hybrid motor cables

Technical data



8BCH0005.1111A-0

8BCH0007.1111A-0

8BCH0010.1111A-0

8BCH0015.1111A-0

8BCH0020.1111A-0

8BCH0025.1111A-0

General information

Certification

CE	Yes
cULus	Yes

Cable construction

Power lines

Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Design	Copper stranded wire
Diameter	1.5 mm ²
Shield	No
Stranding	No

Connector

Type	7-pin female speedtec motor connector
Additional connectors	9-pin male DSUB connector Connection cycles: >50 Contacts: 9 Protection in accordance with EN 60529: IP20 when connected IP67 when connected
EN 60529 protection	IP67 when connected

Electrical characteristics

Test voltage

Wire/Wire	4 kV
Wire/Shield	4 kV

Max. current load in accordance with IEC 60364-5-523 by installation type

Wall mounting	20.2 A
Installed in conduit or cable duct	17.8 A
Installed in cable tray	20.9 A

Environmental conditions

Temperature

Moving	-10 to 80°C
Static	-40 to 90°C

Mechanical characteristics

Dimensions

Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	13 mm ±0.4 mm					

Flex radius

Single bend	>40 mm
Moving	≥100 mm

Drag chain data

Acceleration	4 m/s ²
Flex cycles	3,000,000
Speed	4 m/s

Weight	1.31 kg	1.78 kg	2.48 kg	3.65 kg	4.82 kg	6 kg
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4 mm² hybrid motor cables

Technical data



8BCH0005.1312A-0

8BCH0007.1312A-0

8BCH0010.1312A-0

8BCH0015.1312A-0

8BCH0020.1312A-0

8BCH0025.1312A-0

General information

Certification

CE	Yes
cULus	Yes

Cable construction

Power lines

Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Design	Copper stranded wire
Diameter	4 mm ²
Shield	No
Stranding	No

Connector

Type

7-pin female speedtec motor connector

Additional connectors

9-pin male DSUB connector
Connection cycles: >50
Contacts: 9

Protection in accordance with EN 60529: IP20 when connected

EN 60529 protection

IP67 when connected

Electrical characteristics

Test voltage

Wire/Wire	4 kV
Wire/Shield	4 kV

Max. current load in accordance with IEC 60364-5-523 by installation type

Wall mounting	36.4 A
Installed in conduit or cable duct	31.9 A
Installed in cable tray	38.2 A

Environmental conditions

Temperature

Moving	-10 to 80°C
Static	-40 to 90°C

Mechanical characteristics

Dimensions

Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	15.6 mm ±0.4 mm					

Flex radius

Single bend	>48 mm
Moving	≥120 mm

Drag chain data

Acceleration	4 m/s ²
Flex cycles	3,000,000
Speed	4 m/s

Weight	1.98 kg	2.73 kg	3.86 kg	5.74 kg	7.62 kg	9.5 kg
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2.5 mm² hybrid motor cables, food grade

Technical data



8BCH0005.5221A-0

8BCH0007.5221A-0

8BCH0010.5221A-0

8BCH0015.5221A-0

8BCH0020.5221A-0

8BCH0025.5221A-0

General information

Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	2.5 mm ²
Shield	No
Stranding	No

Connector

Type	9-pin female stainless steel connector
Additional connectors	9-pin male DSUB connector Connection cycles: >50 Contacts: 9
EN 60529 protection	Protection in accordance with EN 60529: IP20 when connected IP67 when connected

Electrical characteristics

Test voltage	
Wire/Wire	4 kV
Wire/Shield	4 kV
Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	31.9 A
Installed in conduit or cable duct	36.4 A
Installed in cable tray	38.2 A

Environmental conditions

Temperature	
Moving	-10 to 80°C
Static	-40 to 90°C

Mechanical characteristics

Dimensions	
Length	5 m 7 m 10 m 15 m 20 m 25 m
Diameter	13 mm ±0.4 mm
Flex radius	
Single bend	>40 mm
Moving	≥100 mm
Drag chain data	
Acceleration	4 m/s ²
Flex cycles	3,000,000
Speed	4 m/s
Weight	In preparation

EnDat 2.1 cables

Technical data



8BCE0005.1111A-0

8BCE0007.1111A-0

8BCE0010.1111A-0

8BCE0015.1111A-0

8BCE0020.1111A-0

8BCE0025.1111A-0

General information

Listed	UL AWM Style 20963, 80°C, 30 V, E63216 and CSA AWM I/II A/B, 90°C, 30 V, FT1 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Supply lines	
Quantity	2
Wire colors	White/Green, white/red
Design	Tinned copper stranded wire
Diameter	0.5 mm ²
Shield	No
Signal lines	
Quantity	10
Wire colors	Blue, brown, yellow, gray, green, pink, red, black, violet, white
Design	Tinned copper stranded wire
Diameter	0.14 mm ²
Shield	No
Complete shielding	Copper braiding, optical coverage >85% and wrapped in foil shield
Outer sheathing	
Material	PUR

Connector

Type	Male EnDat connector, 17-pin female speedtec connector
Additional connectors	Male servo connector, 15-pin female DSUB connector Connection cycles: >50 Contacts: 15 Protection in accordance with EN 60529: IP20 when connected
EN 60529 protection	IP67 when connected

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	7.85 mm ±0.2 mm					
Flex radius						
Single bend	≥24 mm					
Moving	≥60 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	0.52 kg	0.7 kg	0.95 kg	1.36 kg	1.77 kg	2.18 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 65 mm.

EnDat 2.2 cables

Technical data



8BCF0005.1221B-0

8BCF0007.1221B-0

8BCF0010.1221B-0

8BCF0015.1221B-0

8BCF0020.1221B-0

8BCF0025.1221B-0

General information

Listed	UR AWM Style 20963, 80°C, 30 V, E63216 ¹⁾
Certification	
CE	Yes
cULus	Yes

Cable construction

Supply lines	
Quantity	4
Wire colors	White/Green, brown/green, blue, white
Design	Tinned copper stranded wire
Diameter	0.35 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	Yellow, gray, pink, violet
Design	Tinned copper stranded wire
Diameter	0.14 mm ²
Shield	No
Complete shielding	Copper/tin braiding, optical coverage ≥85%
Outer sheathing	
Material	PUR

Connector

Type	12-pin female springtec EnDat connector
Additional connectors	9-pin male DSUB servo connector Connection cycles: >50 Contacts: 9 Protection in accordance with EN 60529: IP20 when connected
EN 60529 protection	IP67 when connected

Electrical characteristics

Operating voltage	≤30 V
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Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	6 mm ±0.2 mm					
Flex radius						
Single bend	≥18 mm					
Moving	≥75 mm					
Drag chain data						
Acceleration	≤60 m/s ²					
Flex cycles	≥3,000,000 ²⁾					
Speed	≤4 m/s					
Weight	0.33 kg	0.42 kg	0.6 kg	0.9 kg	1.4 kg	1.8 kg

¹⁾ The specified values refer to the raw cable being used.

²⁾ Valid at an ambient temperature of 20°C and a flex radius of 75 mm.

Resolver cables

Technical data



8BCR0005.1111A-0

8BCR0007.1111A-0

8BCR0010.1111A-0

8BCR0015.1111A-0

8BCR0020.1111A-0

8BCR0025.1111A-0

General information

Listed	UL AWM Style 20671, 90°C, 30 V, E63216 and CSA AWM, 90°C, 30 V, I/II A/B FT1 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Signal lines	
Quantity	6
Wire colors	White, brown, green, yellow, gray, pink
Design	Tinned copper stranded wire
Diameter	AWG 24 / AWG 19
Shield	No
Complete shielding	Copper braiding, optical coverage $\geq 90\%$ and wrapped in isolating film
Outer sheathing	
Material	PUR

Connector

Type	Resolver connector, 12-pin female speedtec connector
Additional connectors	Male servo connector, female 9-pin DSUB connector Connection cycles: >50 Contacts: 9 Protection in accordance with EN 60529: IP20 when connected
EN 60529 protection	IP67 when connected

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	6.5 mm ± 0.2 mm					
Flex radius						
Single bend	≥ 20 mm					
Moving	≥ 50 mm					
Drag chain data						
Acceleration	< 60 m/s ²					
Flex cycles ¹⁾	$\geq 3,000,000$					
Speed	≤ 4 m/s					
Weight	0.39 kg	0.52 kg	0.7 kg	1 kg	1.4 kg	1.7 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 65 mm.

1.5 mm² expansion cables

8BCA01X5.1111A-0, 8BCA0003.1111A-0, 8BCA0005.1111A-0



- UL/CSA listed
- Can be used in cable drag chains
- Shield plate integrated

General information	8BCA01X5.1111A-0	8BCA0003.1111A-0	8BCA0005.1111A-0
Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064		
Certification	cULus		
	Yes		
Cable construction	8BCA01X5.1111A-0	8BCA0003.1111A-0	8BCA0005.1111A-0
Power lines			
Quantity	3		
Wire colors	Black, brown, yellow/green		
Design	Tinned copper stranded wire		
Diameter	1.5 mm ²		
Shield	No		
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film		
Outer sheathing			
Material	PUR		
Electrical characteristics	8BCA01X5.1111A-0	8BCA0003.1111A-0	8BCA0005.1111A-0
Max. current load in accordance with IEC 60364-5-523 by installation type			
Wall mounting	20 A		
Installed in conduit or cable duct	17.8 A		
Installed in cable tray	20.9 A		
Mechanical characteristics	8BCA01X5.1111A-0	8BCA0003.1111A-0	8BCA0005.1111A-0
Dimensions			
Length	1.5 m	3 m	5 m
Diameter	12.8 mm ±0.4 mm		
Flex radius			
Single bend	≥40 mm		
Moving	≥99 mm		
Drag chain data			
Acceleration	<60 m/s ²		
Flex cycles ¹⁾	≥3,000,000		
Speed	≤4 m/s		
Weight	0.44 kg	0.82 kg	1.33 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 125 mm.

4 mm² expansion cables

8BCA01X5.1312A-0, 8BCA0003.1312A-0, 8BCA0005.1312A-0



- UL/CSA listed
- Can be used in cable drag chains
- Shield plate integrated

General information	8BCA01X5.1312A-0	8BCA0003.1312A-0	8BCA0005.1312A-0
Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064		
Certification	cULus		
	Yes		
Cable construction	8BCA01X5.1312A-0	8BCA0003.1312A-0	8BCA0005.1312A-0
Power lines			
Quantity	3		
Wire colors	Black, brown, yellow/green		
Design	Tinned copper stranded wire		
Diameter	4 mm ²		
Shield	No		
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film		
Outer sheathing			
Material	PUR		
Electrical characteristics	8BCA01X5.1312A-0	8BCA0003.1312A-0	8BCA0005.1312A-0
Max. current load in accordance with IEC 60364-5-523 by installation type			
Wall mounting	36.4 A		
Installed in conduit or cable duct	31.9 A		
Installed in cable tray	38.2 A		
Mechanical characteristics	8BCA01X5.1312A-0	8BCA0003.1312A-0	8BCA0005.1312A-0
Dimensions			
Length	1.5 m	3 m	5 m
Diameter	15.8 mm ±0.5 mm		
Flex radius			
Single bend	≥50 mm		
Moving	≥122 mm		
Drag chain data			
Acceleration	<60 m/s ²		
Flex cycles ¹⁾	≥3,000,000		
Speed	≤4 m/s		
Weight	0.7 kg	1.33 kg	2.17 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 155 mm.

10 mm² expansion cables

8BCA01X5.1513A-0, 8BCA0003.1513A-0, 8BCA0005.1513A-0



- UL/CSA listed
- Can be used in cable drag chains
- Shield plate integrated

General information	8BCA01X5.1513A-0	8BCA0003.1513A-0	8BCA0005.1513A-0
Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064		
Certification	cULus		
	Yes		
Cable construction	8BCA01X5.1513A-0	8BCA0003.1513A-0	8BCA0005.1513A-0
Power lines			
Quantity	3		
Wire colors	Black, brown, yellow/green		
Design	Tinned copper stranded wire		
Diameter	10 mm ²		
Shield	No		
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film		
Outer sheathing			
Material	PUR		
Electrical characteristics	8BCA01X5.1513A-0	8BCA0003.1513A-0	8BCA0005.1513A-0
Max. current load in accordance with IEC 60364-5-523 by installation type			
Wall mounting	64.6 A		
Installed in conduit or cable duct	54.6 A		
Installed in cable tray	68.3 A		
Mechanical characteristics	8BCA01X5.1513A-0	8BCA0003.1513A-0	8BCA0005.1513A-0
Dimensions			
Length	1.5 m	3 m	5 m
Diameter	20.1 mm ±0.7 mm		
Flex radius			
Single bend	≥62 mm		
Moving	≥156 mm		
Drag chain data			
Acceleration	<60 m/s ²		
Flex cycles ¹⁾	≥3,000,000		
Speed	≤4 m/s		
Weight	1.1 kg	2.38 kg	3.8 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 200 mm.

0.75 mm² motor cables (not for use in cable drag chains)

Technical data



8BCM0005.3011A-0

8BCM0007.3011A-0

8BCM0010.3011A-0

8BCM0015.3011A-0

8BCM0020.3011A-0

8BCM0025.3011A-0

General information

Listed	UL Style 2570 80°C 1000 V VW-1 E47573 and cUL AWM I/II A/B 80°C 1000 V FT-1
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	0.75 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	White, white/red, white/blue, white/green
Design	Tinned copper stranded wire
Diameter	0.34 mm ²
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PVC

Connector

Type	Male motor connector, 8-pin female speedtec connector
EN 60529 protection	IP67 when connected

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	9.8 A
Installed in conduit or cable duct	8.5 A
Installed in cable tray	10.4 A

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	10.6 mm ±0.4 mm					
Flex radius						
Single bend	>55 mm					
Moving	≥165 mm					
Weight	0.98 kg	1.32 kg	1.83 kg	2.68 kg	3.53 kg	4.38 kg

0.75 mm² motor cables ESTB (not for use in cable drag chains)

Technical data



8BCM0005.3034C-0

8BCM0007.3034C-0

8BCM0010.3034C-0

8BCM0015.3034C-0

8BCM0020.3034C-0

8BCM0025.3034C-0

General information

Listed	UL Style 2570 80°C 1000 V VW-1 E47573 and cUL AWM I/II A/B 80°C 1000 V FT-1
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	0.75 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	White, white/red, white/blue, white/green
Design	Tinned copper stranded wire
Diameter	0.34 mm ²
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PVC

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	9.8 A
Installed in conduit or cable duct	8.5 A
Installed in cable tray	10.4 A

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	10.6 mm ±0.4 mm					
Flex radius						
Single bend	>55 mm					
Moving	≥165 mm					
Weight	1.2 kg	1.5 kg	2 kg	2.8 kg	3.6 kg	4 kg

1.5 mm² motor cables (not for use in cable drag chains)

Technical data



8BCM0005.3111A-0

8BCM0007.3111A-0

8BCM0010.3111A-0

8BCM0015.3111A-0

8BCM0020.3111A-0

8BCM0025.3111A-0

General information

Listed	UL Style 2570 80°C 1000 V VW-1 E47573 and cUL AWM I/II A/B 80°C 1000 V FT-1
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	1.5 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	White, white/red, white/blue, white/green
Design	Tinned copper stranded wire
Diameter	0.75 mm ²
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PVC

Connector

Type	Male motor connector, 8-pin female speedtec connector, size 1
EN 60529 protection	IP67 when connected

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	15.2 A
Installed in conduit or cable duct	13.1 A
Installed in cable tray	16.1 A

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	12.3 mm ±0.4 mm					
Flex radius						
Single bend	>64 mm					
Moving	≥190 mm					
Weight	1.4 kg	1.8 kg	2.5 kg	3.7 kg	4.8 kg	6 kg

4 mm² motor cables (not for use in cable drag chains)

Technical data



8BCM0005.3312A-0

8BCM0007.3312A-0

8BCM0010.3312A-0

8BCM0015.3312A-0

General information

Listed	UL Style 2570 80°C 1000 V VW-1 E47573 and cUL AWM I/II A/B 80°C 1000 V FT-1
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	4 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	White, white/red, white/blue, white/green
Design	Tinned copper stranded wire
Diameter	1 mm ²
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PVC

Connector

Type	Male motor connector, 8-pin female speedtec connector, size 1
EN 60529 protection	IP67 when connected

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	28 A
Installed in conduit or cable duct	23 A
Installed in cable tray	30 A

Mechanical characteristics

Dimensions				
Length	5 m	7 m	10 m	15 m
Diameter	15.6 mm ±0.6 mm			
Flex radius				
Single bend	>81 mm			
Moving	≥243 mm			
Weight	2.2 kg	3 kg	4.2 kg	6.2 kg

EnDat 2.1 (not for use in cable drag chains)

Technical data



8BCE0005.3111A-0

8BCE0007.3111A-0

8BCE0010.3111A-0

8BCE0015.3111A-0

8BCE0020.3111A-0

8BCE0025.3111A-0

General information

Listed	UL AWM Style 2637 90°C 30 V E130266 and CSA AWM I/II A/B 90°C 30 V, FT1
Certification	
CE	Yes
cULus	Yes

Cable construction

Supply lines	
Quantity	2
Wire colors	White/Green, white/red
Design	Tinned copper stranded wire
Diameter	0.5 mm ²
Shield	No
Signal lines	
Quantity	10
Wire colors	Blue, brown, yellow, gray, green, pink, red, black, violet, white
Design	Tinned copper stranded wire
Diameter	0.14 mm ²
Shield	No
Complete shielding	Copper braiding, optical coverage >85% and wrapped in foil shield
Outer sheathing	
Material	PVC

Connector

Type	Male EnDat connector, 17-pin female speedtec connector
Additional connectors	Male servo connector, 15-pin female DSUB connector Connection cycles: >50 Contacts: 15 Protection in accordance with EN 60529: IP20 when connected
EN 60529 protection	IP67 when connected

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	7.6 mm ±0.2 mm					
Flex radius						
Single bend	≥31 mm					
Moving	≥62 mm					
Weight	0.5 kg	0.7 kg	0.9 kg	1.3 kg	1.7 kg	2.1 kg

Resolver cables (not for use in cable drag chains)

Technical data



8BCR0005.3111A-0

8BCR0007.3111A-0

8BCR0010.3111A-0

8BCR0015.3111A-0

8BCR0020.3111A-0

8BCR0025.3111A-0

General information

Listed	UL AWM Style 2637 90°C 30 V E130266 and CSA AWM I/II A/B 90°C 30 V, FT1
Certification	
CE	Yes
cULus	Yes

Cable construction

Signal lines	
Quantity	6
Wire colors	White, brown, green, yellow, gray, pink
Design	Tinned copper stranded wire
Diameter	0.22 mm
Shield	No
Complete shielding	Copper braiding, optical coverage $\geq 90\%$ and wrapped in isolating film
Outer sheathing	
Material	PVC

Connector

Type	Resolver connector, 12-pin female speedtec connector
Additional connectors	Male servo connector, female 9-pin DSUB connector Connection cycles: >50 Contacts: 9
EN 60529 protection	Protection in accordance with EN 60529: IP20 when connected IP67 when connected

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	6.3 mm ± 0.2 mm					
Flex radius						
Single bend	≥ 26 mm					
Moving	≥ 52 mm					
Weight	0.46 kg	0.42 kg	0.76 kg	1.06 kg	1.36 kg	1.66 kg

Resolver cables ESTB (not for use in cable drag chains)

Technical data



8BCR0005.3121A-0

8BCR0007.3121A-0

8BCR0010.3121A-0

8BCR0015.3121A-0

8BCR0020.3121A-0

8BCR0025.3121A-0

General information

Listed	UL AWM Style 2637 90°C 30 V E130266 and CSA AWM I/II A/B 90°C 30 V, FT1
Certification	
CE	Yes
cULus	Yes

Cable construction

Signal lines	
Quantity	6
Wire colors	White, brown, green, yellow, gray, pink
Design	Tinned copper stranded wire
Diameter	0.22 mm
Shield	No
Complete shielding	Copper braiding, optical coverage $\geq 90\%$ and wrapped in isolating film
Outer sheathing	
Material	PVC

Connector

Type	Male resolver connector, 12-pin female springtec connector
Additional connectors	Male servo connector, female 9-pin DSUB connector Connection cycles: >50 Contacts: 9 Protection in accordance with EN 60529: IP20 when connected
EN 60529 protection	IP67 when connected

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	6.3 mm ± 0.2 mm					
Flex radius						
Single bend	≥ 26 mm					
Moving	≥ 52 mm					
Weight	0.34 kg	0.46 kg	0.64 kg	0.94 kg	1.24 kg	1.54 kg

Cable extensions for 1.5 mm² motor cables

Technical data



8BCM0005.11140-0

8BCM0007.11140-0

8BCM0010.11140-0

8BCM0015.11140-0

8BCM0020.11140-0

8BCM0025.11140-0

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	1.5 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	White, white/red, white/blue, white/green
Design	Tinned copper stranded wire
Diameter	0.75 mm ²
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	20 A
Installed in conduit or cable duct	17.8 A
Installed in cable tray	20.9 A

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	12.8 mm ±0.4 mm					
Flex radius						
Single bend	>40 mm					
Moving	≥99 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	1.3 kg	1.8 kg	2.6 kg	3.9 kg	5 kg	6.5 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 125 mm.

Cable extensions for 4 mm² motor cables

Technical data



8BCM0005.13140-0

8BCM0007.13140-0

8BCM0010.13140-0

8BCM0015.13140-0

8BCM0020.13140-0

8BCM0025.13140-0

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	4 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	White, white/red, white/blue, white/green
Design	Tinned copper stranded wire
Diameter	1 mm ²
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	36.4 A
Installed in conduit or cable duct	31.9 A
Installed in cable tray	38.2 A

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	15.8 mm ±0.5 mm					
Flex radius						
Single bend	>50 mm					
Moving	≥122 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	2.25 kg	3.15 kg	4.5 kg	6.75 kg	9 kg	11.25 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 155 mm.

Cable extensions for 10 mm² motor cables

Technical data



8BCM0005.15250-0

8BCM0007.15250-0

8BCM0010.15250-0

8BCM0015.15250-0

8BCM0020.15250-0

8BCM0025.15250-0

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064					
Certification						
CE	Yes					
cULus	Yes					

Cable construction

Power lines						
Quantity	4					
Wire colors	Black, brown, blue, yellow/green					
Design	Tinned copper stranded wire					
Diameter	10 mm ²					
Shield	No					
Signal lines						
Quantity	4					
Wire colors	White, white/red, white/blue, white/green					
Design	Tinned copper stranded wire					
Diameter	1.5 mm ²					
Shield	Pairs shielded separately, tinned copper braiding, optical coverage >85% and foil banding					
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film					
Outer sheathing						
Material	PUR					

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	64.6 A
Installed in conduit or cable duct	54.6 A
Installed in cable tray	68.3 A

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	20.1 mm ±0.7 mm					
Flex radius						
Single bend	>62 mm					
Moving	≥156 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	3.85 kg	5.4 kg	7.7 kg	11.5 kg	15.4 kg	19.3 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 200 mm.

Cable extensions for EnDat 2.1 cables

Technical data



8BCE0005.11120-0

8BCE0007.11120-0

8BCE0010.11120-0

8BCE0015.11120-0

8BCE0020.11120-0

8BCE0025.11120-0

General information

Listed	UL AWM Style 20963, 80°C, 30 V, E63216 and CSA AWM I/II A/B, 90°C, 30 V, FT1 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Supply lines	
Quantity	2
Wire colors	White/Green, white/red
Design	Tinned copper stranded wire
Diameter	0.5 mm ²
Shield	No
Signal lines	
Quantity	10
Wire colors	Blue, brown, yellow, gray, green, pink, red, black, violet, white
Design	Tinned copper stranded wire
Diameter	0.14 mm ²
Shield	No
Complete shielding	Copper braiding, optical coverage >85% and wrapped in foil shield
Outer sheathing	
Material	PUR

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	7.85 mm ±0.2 mm					
Flex radius						
Single bend	≥24 mm					
Moving	≥60 mm					
Drag chain data						
Acceleration	<60 m/s ²					
Flex cycles ¹⁾	≥3,000,000					
Speed	≤4 m/s					
Weight	0.41 kg	0.57 kg	0.81 kg	1.21 kg	1.6 kg	2 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 65 mm.

Cable extensions for resolver cables

Technical data



8BCR0005.11120-0

8BCR0007.11120-0

8BCR0010.11120-0

8BCR0015.11120-0

8BCR0020.11120-0

8BCR0025.11120-0

General information

Listed	UL AWM Style 20671, 90°C, 30 V, E63216 and CSA AWM, 90°C, 30 V, I/II A/B FT1 LL46064					
Certification						
CE	Yes					
cULus	Yes					

Cable construction

Signal lines						
Quantity	6					
Wire colors	White, brown, green, yellow, gray, pink					
Design	Tinned copper stranded wire					
Diameter	AWG 24 / AWG 19					
Shield	No					
Complete shielding	Copper braiding, optical coverage $\geq 90\%$ and wrapped in isolating film					
Outer sheathing						
Material	PUR					

Mechanical characteristics

Dimensions						
Length	5 m	7 m	10 m	15 m	20 m	25 m
Diameter	6.5 mm ± 0.2 mm					
Flex radius						
Single bend	≥ 20 mm					
Moving	≥ 50 mm					
Drag chain data						
Acceleration	< 60 m/s ²					
Flex cycles ¹⁾	$\geq 3,000,000$					
Speed	≤ 4 m/s					
Weight	0.33 kg	0.46 kg	0.7 kg	1 kg	1.4 kg	1.7 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 65 mm.

Cable extensions for resolver cables ESTB

Technical data



8BCR0005.11230-0

8BCR0007.11230-0

8BCR0010.11230-0

8BCR0015.11230-0

8BCR0020.11230-0

8BCR0025.11230-0

General information

Listed	UL AWM Style 20671, 90°C, 30 V, E63216 and CSA AWM, 90°C, 30 V, I/II A/B FT1 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Signal lines	
Quantity	6
Wire colors	White, brown, green, yellow, gray, pink
Design	Tinned copper stranded wire
Diameter	AWG 24 / AWG 19
Shield	No
Complete shielding	Copper braiding, optical coverage $\geq 90\%$ and wrapped in isolating film
Outer sheathing	
Material	PUR

Connector

Type	springtec connector
EN 60529 protection	IP67 when connected

Mechanical characteristics

Dimensions	5 m	7 m	10 m	15 m	20 m	25 m
Length						
Diameter	6.5 mm ± 0.2 mm					
Flex radius						
Single bend	≥ 20 mm					
Moving	≥ 50 mm					
Drag chain data						
Acceleration	< 60 m/s ²					
Flex cycles ¹⁾	$\geq 3,000,000$					
Speed	≤ 4 m/s					
Weight	0.33 kg	0.46 kg	0.65 kg	0.98 kg	1.30 kg	1.63 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 65 mm.

Feed-through receptacles and terminal block sets

8BXC000.0000-00, 8BXC001.0000-00, 8BXC002.0000-00, 8BXC003.0000-00, 8BXC004.0000-00, 8BXC005.0000-00



General information	8BXC000.0000-00	8BXC001.0000-00	8BXC002.0000-00	8BXC003.0000-00	8BXC004.0000-00	8BXC005.0000-00
Short description	8-pin feed-through receptacle, for motor cables with speedtec or standard connector, UL/CSA listed	8-pin feed-through receptacle, for motor cables with speedtec or standard size 1.5 connector, UL/CSA listed	12-pin feed-through receptacle, for encoder cables with speedtec or standard connector, UL/CSA listed	17-pin feed-through receptacle, for encoder cables with speedtec or standard connector, UL/CSA listed	9-pin feed-through receptacle, for motor cables with speedtec connector, UL/CSA listed	12-pin feed-through receptacle, for resolver cables with speedtec connector, UL/CSA listed

8BZ0C016000.001-1A, 8BZ0C016000.A01-1A, 8BZ0C032000.000-1A, 8BZ0C032000.002-1A, 8BZ0C032000.00A-1A



General information	8BZ0C016000.001-1A	8BZ0C016000.A01-1A	8BZ0C032000.000-1A	8BZ0C032000.002-1A	8BZ0C032000.00A-1A
Short description	Screw clamp set for ACOPOSmulti modules 8B0C0160Hx00.001-1: 1x 8TB3104.201M-10, 1x 8TB2104.2010-00, 1x 8TB2106.2010-00	Screw clamp set for ACOPOSmulti 8B0C0160Hx00.A01-1 modules: 1x 8TB3104.201H-10, 1x 8TB2104.2010-00, 1x 8TB2106.2010-00	Screw clamp set for ACOPOSmulti 8B0C0xx0Hx00.000-1 modules: 1x 8TB2106.2010-00	Screw clamp set for ACOPOSmulti 8B0C0320Hx00.002-1 modules: 1x 8TB3104.201M-10, 1x 8TB2104.2010-00, 1x 8TB2106.2010-00	Screw clamp set for ACOPOSmulti 8B0C0320Hx00.00A-1 modules: 1x 8TB3104.201M-10, 1x 8TB2104.2010-00, 1x 8TB2106.2010-00

Certification

CE	Yes
cULus	Yes

Terminal block sets

8BZ0P044000.000-1A, 8BZVE050000.000-1A, 8BZVF044000.001-2A, 8BZVF088000.000-1A



General information	8BZ0P044000.000-1A	8BZVE050000.000-1A	8BZVF044000.001-2A	8BZVF088000.000-1A
Short description	Screw clamp set for ACOPOSmulti modules 8B0P0220Hx00.00x-1 and 8B0P0440Hx00.00x-1: 1x 8TB4104.202L-10, 1x 8TB4103.202A-00, 1x 8TB2106.2010-00	Screw clamp set for ACOPOS-multi 8BVE0500Hx00.000-1 modules: 2x 8TB3102.201C-10, 2x 8TB4103.203C-10, 1x 8TB2104.2010-00	Screw clamp set for ACOPOSmulti modules 8BVF0220H000.000-1 and 8BVF0440H000.001-2: 1x 8TB4104.202N-10, 1x 8TB4104.206D-10, 1x 8TB2104.204A-00	Screw clamp set for ACOPOSmulti 8BVF0880H000.000-1 modules: 1x 8TB2104.204A-00
Certification			Yes	
CE			Yes	
cULus			Yes	
Mechanical characteristics	8BZ0P044000.000-1A	8BZVE050000.000-1A	8BZVF044000.001-2A	8BZVF088000.000-1A
Weight	-	88 g	80 g	8 g

8BZVI0055D0.000-1A, 8BZVI0055DS.000-1A, 8BZVI0055S0.000-1A, 8BZVI0055SS.000-1A, 8BZVI0110D0.000-1A, 8BZVI0110DS.000-1A



General information	8BZVI0055D0.000-1A	8BZVI0055DS.000-1A	8BZVI0055S0.000-1A	8BZVI0055SS.000-1A	8BZVI0110D0.000-1A	8BZVI0110DS.000-1A
Short description	Screw clamp set for ACOPOSmulti 8BVI00xx-HxD0 modules: 1x 8TB2112.2010-00, 1x 8TB2108.2010-00, 1x 8TB2104.203L-00, 1x 8TB2104.203F-00, 1x 8TB3104.204G-00, 1x 8TB3104.204K-00	Screw clamp set for ACOPOSmulti 8BVI00xx-HxDS modules: 1x 8TB2108.2010-00, 1x 8TB2104.203L-00, 1x 8TB2104.203F-00, 1x 8TB3104.204G-00, 1x 8TB3104.204K-00	Screw clamp set for ACOPOSmulti 8BVI00xx-HxS0 modules: 1x 8TB3104.204G-00, 1x 8TB2104.203L-00, 1x 8TB2106.2010-00, 1x 8TB2108.2010-00	Screw clamp set for ACOPOSmulti 8BVI00xx-HxSS modules: 1x 8TB3104.204G-00, 1x 8TB2104.203L-00, 1x 8TB2108.2010-00	Screw clamp set for ACOPOSmulti 8BVI0110HxD0 modules: 1x 8TB2112.2010-00, 1x 8TB2108.2010-00, 1x 8TB2104.203L-00, 1x 8TB2104.203F-00, 1x 8TB3104.204G-00, 1x 8TB3104.204K-00	Screw clamp set for ACOPOSmulti 8BVI0110HxDS modules: 1x 8TB2108.2010-00, 1x 8TB2104.203L-00, 1x 8TB2104.203F-00, 1x 8TB3104.204G-00, 1x 8TB3104.204K-00
Certification				Yes		
CE				Yes		
cULus				Yes		
Mechanical characteristics	8BZVI0055D0.000-1A	8BZVI0055DS.000-1A	8BZVI0055S0.000-1A	8BZVI0055SS.000-1A	8BZVI0110D0.000-1A	8BZVI0110DS.000-1A
Weight	110 g	75 g	68 g	51 g	110 g	75 g

8BZVI0110S0.000-1A, 8BZVI0110SS.000-1A, 8BZVI0220D0.000-1A, 8BZVI0220DS.000-1A, 8BZVI0220S0.000-1A, 8BZVI0220SS.000-1A



General information	8BZVI0110S0.000-1A	8BZVI0110SS.000-1A	8BZVI0220D0.000-1A	8BZVI0220DS.000-1A	8BZVI0220S0.000-1A	8BZVI0220SS.000-1A
Short description	Screw clamp set for ACOPOSmulti 8BVI0110HxS0 modules: 1x 8TB3104.204G-00, 1x 8TB2104.203L-00, 1x 8TB2106.2010-00, 1x 8TB2108.2010-00	Screw clamp set for ACOPOSmulti 8BVI0110HxSS modules: 1x 8TB3104.204G-00, 1x 8TB2104.203L-00, 1x 8TB2108.2010-00	Screw clamp set for ACOPOSmulti 8BVI0220HxD0 modules: 1x 8TB2112.2010-00, 1x 8TB2108.2010-00, 1x 8TB2104.203L-00, 1x 8TB2104.203F-00, 1x 8TB3104.204G-10, 1x 8TB3104.204K-10	Screw clamp set for ACOPOSmulti 8BVI0220HxDS modules: 1x 8TB2108.2010-00, 1x 8TB2104.203L-00, 1x 8TB2104.203F-00, 1x 8TB3104.204G-10, 1x 8TB3104.204K-10	Screw clamp set for ACOPOSmulti 8BVI0220HxS0 modules: 1x 8TB2106.2010-00, 1x 8TB2108.2010-00, 1x 8TB2104.203L-00, 1x 8TB4104.204G-00	Screw clamp set for ACOPOSmulti 8BVI0220HxSS modules: 1x 8TB2108.2010-00, 1x 8TB2104.203L-00, 1x 8TB4104.204G-00
Certification				Yes		
CE				Yes		
cULus				Yes		
Mechanical characteristics						
Weight	68 g	68 g	114 g	79 g	72 g	65 g

8BZVI0440S0.000-1A, 8BZVI0440SS.000-1A, 8BZVI1650S0.000-1A, 8BZVI1650SS.000-1A, 8BZVP044000.000-1A, 8BZVP165000.000-1A



General information	8BZVI0440S0.000-1A	8BZVI0440SS.000-1A	8BZVI1650S0.000-1A	8BZVI1650SS.000-1A	8BZVP044000.000-1A	8BZVP165000.000-1A
Short description	Screw clamp set for ACOPOSmulti 8BVI0440HxS0 modules: 1x 8TB2106.2010-00, 1x 8TB2108.2010-00, 1x 8TB2104.203L-00, 1x 8TB4104.204G-10	Screw clamp set for ACOPOSmulti 8BVI0440HxSS modules: 1x 8TB2108.2010-00, 1x 8TB2104.203L-00, 1x 8TB4104.204G-10	Screw clamp set for ACOPOSmulti modules 8BVI0880HxS0 and 8BVI16500HxS0: 1x 8TB2104.203L-00, 1x 8TB2106.2010-00, 1x 8TB2108.2010-00	Screw clamp set for ACOPOSmulti modules 8BVI0880HxSS and 8BVI1650HxSS: 1x 8TB2104.203L-00, 1x 8TB2108.2010-00	Screw clamp set for ACOPOSmulti modules 8BVP0220Hx00 and 8BVP0440Hx00: 1x 8TB2106.2010-00, 1x 8TB2108.2010-00, 1x 8TB2104.204A-00, 1x 8TB4104.202L-10	Screw clamp set for ACOPOSmulti modules 8BVP0880Hx00 and 8BVP1650Hx00: 1x 8TB2104.204A-00, 1x 8TB2106.2010-00, 1x 8TB2108.2010-00
Certification				Yes		
CE				Yes		
cULus				Yes		
Mechanical characteristics						
Weight	72 g	67 g	67 g	42 g	85 g	49 g

Terminal blocks

8TB2104.2010-00, 8TB2104.203F-00, 8TB2104.203L-00, 8TB2104.204A-00, 8TB2106.2010-00



Terminal block	8TB2104.2010-00	8TB2104.203F-00	8TB2104.203L-00	8TB2104.204A-00	8TB2106.2010-00
Note	Label 1: numbered serially 0 keying: none Nominal values according to UL	Label 3: T- T+ B- B+ F keying: 0101 Nominal values according to UL	Label 3: T- T+ B- B+ L keying: 1010 Nominal values according to UL	Label 4: T- T+ F- F+ A keying: 0000 Nominal values according to UL	Label 1: numbered serially 0 keying: none Nominal values according to UL
Number of pins	4	4	4	4	6
Type of terminal clamp	Screw clamp terminal block				
Cable type	Only copper wires (no aluminum wires!)				
Keying	0	F	L	A	0
Distance between contacts	5.08 mm				
Connection cross section					
AWG wire	30 to 12 AWG				
Wire end sleeves with plastic covering	0.25 to 2.5 mm ²				
Solid wires	0.2 to 2.5 mm ²				
Fine strand wires	0.2 to 1.5 mm ²				
With wire end sleeves	0.25 to 2.5 mm ²				
Tightening torque	0.5 to 0.6 Nm				
Electrical characteristics	8TB2104.2010-00	8TB2104.203F-00	8TB2104.203L-00	8TB2104.204A-00	8TB2106.2010-00
Nominal voltage	300 V				
Nominal current	10 A				

8TB2108.2010-00, 8TB2112.2010-00, 8TB3102.201C-11, 8TB3104.201H-11



Terminal block	8TB2108.2010-00	8TB2112.2010-00	8TB3102.201C-11	8TB3104.201H-11
Note	Label 1: numbered serially 0 keying: none Nominal values according to UL	Label 1: numbered serially 0 keying: none Nominal values according to UL	Label 1: numbered serially C keying: 10 Nominal values according to UL	Label 1: numbered serially H keying: 0111 Nominal values according to UL
Number of pins	8	12	2	4
Type of terminal clamp	Screw clamp terminal block			
Cable type	Only copper wires (no aluminum wires!)			
Keying	0	0	C	H
Distance between contacts	5.08 mm	5.08 mm	7.62 mm	7.62 mm
Connection cross section				
AWG wire	30 to 12 AWG	30 to 12 AWG	24 to 8 AWG	24 to 8 AWG
Wire end sleeves with plastic covering	0.25 to 2.5 mm ²	0.25 to 2.5 mm ²	0.25 to 4 mm ²	0.25 to 4 mm ²
Solid wires	0.2 to 2.5 mm ²	0.2 to 2.5 mm ²	0.2 to 6 mm ²	0.2 to 6 mm ²
Fine strand wires	0.2 to 1.5 mm ²	0.2 to 1.5 mm ²	0.2 to 4 mm ²	0.2 to 4 mm ²
With wire end sleeves	0.25 to 2.5 mm ²	0.25 to 2.5 mm ²	0.25 to 6 mm ²	0.25 to 6 mm ²
Tightening torque	0.5 to 0.6 Nm	0.5 to 0.6 Nm	0.7 to 0.8 Nm	0.7 to 0.8 Nm
Electrical characteristics	8TB2108.2010-00	8TB2112.2010-00	8TB3102.201C-11	8TB3104.201H-11
Nominal voltage	300 V	300 V	600 V	600 V
Nominal current	10 A	10 A	41 A	41 A

Terminal blocks

8TB3104.201M-11, 8TB3104.204G-11, 8TB3104.204K-11, 8TB4103.203C-10



Terminal block	8TB3104.201M-11	8TB3104.204G-11	8TB3104.204K-11	8TB4103.203C-10
Note	Label 1: numbered serially M keying: 1011 Nominal values according to UL	Label 4: PE W V U G keying: 0110 Nominal values according to UL	Label 4: PE W V U K keying: 1001 Nominal values according to UL	Label 3: +DC -DC PE C keying: 010 Nominal values according to UL
Number of pins	4	4	4	3
Type of terminal clamp	Screw clamp terminal block			
Cable type	Only copper wires (no aluminum wires!)			
Keying	M	G	K	C
Distance between contacts	7.62 mm	7.62 mm	7.62 mm	10.16 mm
Connection cross section				
AWG wire	24 to 8 AWG	24 to 8 AWG	24 to 8 AWG	20 to 6 AWG
Wire end sleeves with plastic covering	0.25 to 4 mm ²	0.25 to 4 mm ²	0.25 to 4 mm ²	0.5 to 10 mm ²
Solid wires	0.2 to 6 mm ²	0.2 to 6 mm ²	0.2 to 6 mm ²	0.75 to 16 mm ²
Fine strand wires	0.2 to 4 mm ²	0.2 to 4 mm ²	0.2 to 4 mm ²	0.75 to 6 mm ²
With wire end sleeves	0.25 to 6 mm ²	0.25 to 6 mm ²	0.25 to 6 mm ²	0.5 to 16 mm ²
Tightening torque	0.7 to 0.8 Nm	0.7 to 0.8 Nm	0.7 to 0.8 Nm	1.7 to 1.8 Nm
Electrical characteristics	8TB3104.201M-11	8TB3104.204G-11	8TB3104.204K-11	8TB4103.203C-10
Nominal voltage			600 V	
Nominal current	41 A	41 A	41 A	55 A

8TB4104.202L-10, 8TB4104.202N-10, 8TB4104.206D-10, 8TB4104.204G-00, 8TB4104.204G-10



Terminal block	8TB4104.202L-10	8TB4104.202N-10	8TB4104.206D-10	8TB4104.204G-00	8TB4104.204G-10
Note	Label 2: L1 L2 L3 PE L keying: 1010 Nominal values according to UL	Label 2: L1 L2 L3 P3 N keying: 1100 Nominal values according to UL	Label 2: L1` L2` L3` PE G keying: 0011 Nominal values according to UL	Label 4: PE W V U G keying: 0110 Nominal values according to UL	Label 4: PE W V U G keying: 0110 Nominal values according to UL
Number of pins	4				
Type of terminal clamp	Screw clamp terminal block				
Cable type	Only copper wires (no aluminum wires!)				
Keying	L	N	D	G	G
Distance between contacts	10.16 mm				
Connection cross section					
AWG wire	20 to 6 AWG	20 to 6 AWG	20 to 6 AWG	20 to 8 AWG	20 to 6 AWG
Wire end sleeves with plastic covering	0.5 to 10 mm ²	0.5 to 10 mm ²	0.5 to 10 mm ²	0.5 to 6 mm ²	0.5 to 10 mm ²
Solid wires	0.75 to 16 mm ²	0.75 to 16 mm ²	0.75 to 16 mm ²	0.75 to 6 mm ²	0.75 to 16 mm ²
Fine strand wires			0.75 to 6 mm ²		
With wire end sleeves	0.5 to 16 mm ²	0.5 to 16 mm ²	0.5 to 16 mm ²	0.5 to 6 mm ²	0.5 to 16 mm ²
Tightening torque	1.7 to 1.8 Nm	1.7 to 1.8 Nm	1.7 to 1.8 Nm	1.2 to 1.5 Nm	1.7 to 1.8 Nm
Electrical characteristics	8TB4104.202L-10	8TB4104.202N-10	8TB4104.206D-10	8TB4104.204G-00	8TB4104.204G-10
Nominal voltage	600 V				
Nominal current	55 A	55 A	55 A	50 A	55 A

Shield component sets

8SCS000.0000-00, 8SCS001.0000-00, 8SCS002.0000-00, 8SCS003.0000-00, 8SCS004.0000-00



General information	8SCS000.0000-00	8SCS001.0000-00	8SCS002.0000-00	8SCS003.0000-00	8SCS004.0000-00
Short description	ACOPOSMulti shield component set: 1 shield plate 1x type 0; 1 hose clamp, B 9 mm, D 12-22 mm	ACOPOSMulti shield component set: 1 shield plate 4x type 1; 1 hose clamp, B 9 mm, D 12-22 mm	ACOPOSMulti shield component set: 1 clamping plate; 2 clamps D 4-13.5 mm; 2 screws	ACOPOSMulti shield component set: 1 shield mounting plate 4x 45°; 8 screws	ACOPOSMulti shield component set: 1 shield plate 4x type 0; 2 hose clamps, B 9 mm, D 32-50 mm
Certification	CE		Yes	CE	
Mechanical characteristics	8SCS000.0000-00	8SCS001.0000-00	8SCS002.0000-00	8SCS003.0000-00	8SCS004.0000-00
Weight	32 g	32 g	57.7 g	330 g	58.1 g

8SCS005.0000-00, 8SCS007.0000-00, 8SCS008.0000-00, 8SCS009.0000-00, 8SCS010.0000-00



General information	8SCS005.0000-00	8SCS007.0000-00	8SCS008.0000-00	8SCS009.0000-00	8SCS010.0000-00
Short description	ACOPOSMulti shield component set: 1 slot cover / shield plate	ACOPOSMulti shield component set: 1 shield mounting plate 2x 45°; 4 screws	ACOPOSMulti shield component set: 1 shield plate 2x type 0; 1 hose clamp, B 9 mm, D 23-35 mm	ACOPOSMulti shield component set: 1 ACOPOSMulti holding plate SK8-14; 1 shield terminal SK14	ACOPOSMulti shield component set: 1 ACOPOSMulti holding plate SK14-20; 1 shield terminal SK20
Certification	CE		Yes	CE	
Mechanical characteristics	8SCS005.0000-00	8SCS007.0000-00	8SCS008.0000-00	8SCS009.0000-00	8SCS010.0000-00
Weight	6 g	130 g	32 g	40.5 g	55.4 g

Fan modules

8B0M0040HFF0.000-1



General information

Short description	ACOPOSMulti fan module for mounting plate 8B0MxxxxHF00.xxx-x
Certification	
CE	Yes
cULus	Yes
GOST-R	Yes

24 VDC supply

Connection	1x M8 connector 4-pin female 1x M8 connector 4-pin male
Power consumption	32 W

Mechanical characteristics

Volume flow	325 m ³ /h @ 0 Pa 210 Pa @ 0 m ³ /h 275 m ³ /h @ 120 Pa
Operating noise	61 dB(A)
Service life	
At 40°C	80,000 h
Dimensions	
Width	200 mm
Height	200 mm
Depth	90 mm
Weight	1.2 kg

8BXF001.0000-00



General information

Short description	ACOPOSMulti fan module, replacement fan for ACOPOSMulti modules (8BVP / 8B0C / 8BVI / 8BVE / 8B0K)
Certification	
CE	Yes
cULus	Yes

Fan modules

8BXF002.0000-00



General information

Short description	ACOPOSmulti fan module, replacement fan for mounting plate with backplane module, wall mounting (8B0MxxxxHWxx.xxx-x)
Certification	
CE	Yes
cULus	Yes

Fuse sets

8BXS000.0000-00, 8BXS001.0000-00, 8BXS002.0000-00, 8BXS003.0000-00, 8BXS004.0000-00, 8BXS005.0000-00



General information	8BXS000.0000-00	8BXS001.0000-00	8BXS002.0000-00	8BXS003.0000-00	8BXS004.0000-00	8BXS005.0000-00
Short description	ACOPOSMulti fuse set: 2 fuses, 14 x 51 mm, 50 A, ultra fast-acting	ACOPOSMulti fuse set: 2 fuses, 14 x 51 mm, 20 A, ultra fast-acting	ACOPOSMulti fuse set: 2 fuses, 14 x 51 mm, 10 A, ultra fast-acting	ACOPOSMulti fuse set: 1x fuse 10x38 mm, 30 A, fast-acting	ACOPOSMulti fuse set: 1x fuse 10x38 mm, 12 A, fast-acting	ACOPOSMulti fuse set: 2 fuses, 14 x 51 mm, 25 A, ultra fast-acting
Certification	CE					
	Yes					
Mechanical characteristics	8BXS000.0000-00	8BXS001.0000-00	8BXS002.0000-00	8BXS003.0000-00	8BXS004.0000-00	8BXS005.0000-00
Weight		41 g			9 g	41 g






ACOPOSremote

Distributed drive system

Being able to directly integrate drive components into the machine is a fundamental requirement for modular machine manufacturing. B&R has designed the ACOPOSremote distributed drive system to meet this requirement, allowing implementation of drive solutions that are completely optimized to the application at hand.

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8CVI decentralized inverters

Drive solutions that are tailored exactly to the application are essential to keeping machines and systems competitive. That's why directly integrating inverters in the immediate environment of the actuator – without the need for additional accompanying measures – is the perfect solution. With the new ACOPOSremote drive system, B&R is now accommodating this wish.

This architecture offers many different advantages when it comes to machine configuration.

The ideal topology

One of the most substantial advantages has to do with the hybrid cabling between the inverters themselves. Simply connecting ACOPOSremote drive modules together in a line – the "daisy chain" wiring scheme – results in an uncomplicated and flexible machine architecture where energy is passed from one drive module to the next.

Integrated modularity

All modules in the ACOPOSremote product line are designed with IP65 protection, which makes it possible to mount them directly on the machine. The control cabinet then only has to contain the power supply, high-powered inverter modules and other necessary electrical switching equipment. The result is a much easier implementation of modular machine architectures. When optional machine functions are required, they can easily be connected – with the requisite dimensioning of the power supply – to the machine's main line using hybrid cables.

Free motor selection

Because the inverter is separate from the motor, the user is free to select the actuator best suited to his drive solution. This type of installation is particularly well suited for the increasingly prevalent linear and torque motors. It prevents the properties of the motor from being negatively influenced, and the maximum possible dynamics remain available throughout.

Homogeneous and compatible

ACOPOSremote drive systems offer the well-known functionality of the ACOPOSmulti drive family and can therefore be integrated homogeneously into a drive solution.

Optimal machine and system configurations are based on the ACOPOSremote – the ideal enhancement for modular drive solutions that require the highest levels of performance and flexibility.



8CVE remote connection box

ACOPOSremote 8CUI inverters are usually connected via a hybrid cable by simply arranging the individual modules in a line structure. This type of arrangement places a number of demands on the hybrid cable. In addition to its main tasks of supplying energy and handling network communication, other aspects such as connector technology, manageability and flex radius also need to be taken into consideration. The sum of these demands results in a practical limit to the cable diameter, which in turn limits the maximum current available to supply the ACOPOSremote 8CUI inverters in this line structure.

In applications where this maximum current is insufficient, the necessary power must be provided in another way, made available to a remote location on-site and then redistributed from there. This is where the 8CVE remote connection box comes in.

Robust and flexible

Like the ACOPOSremote, the 8CVE remote connection box is designed with IP65 protection so it can be mounted directly on the machine. The robust housing makes it ideal for use in tough environments and gives the user the freedom to position the device wherever it best serves the application at hand.

Separate cable routing means more free space

Because the power supply, the 24 V supply, the safety technology (STO signals) and the POWERLINK network are wired separately, the 8CVE remote connection box can provide a considerable amount of power directly to the machine (up to 30 kW).

Not only that, but it's also possible to use standard cables to implement alternative solutions such as transferring energy using slip rings. This provides the user with the flexibility to work with conventional connector technology while still being able to use remote servo drive technology.

Extensive connection options

The 8CVE remote connection box comes equipped with four hybrid cable outlets, which allows the power to be divided between up to four ACOPOSremote 8CUI inverter line structures.

Classic wiring solutions have also been taken into consideration. The connections necessary for the STO signals (Safe Torque Off) are also included on the 8CVE remote connection box and directly affect the ACOPOSremote 8CUI inverters connected to the hybrid cable outlets.

In addition, the 8CVE remote connection box is equipped with two local I/O connections – another example of exemplary support for modular machine concepts.

Product overview

ACOPOSremote



Connection boxes

 864



Inverter modules

 867



8BVE/8CVI connection cables



Hybrid cables

 882



Hybrid cable, 1x connector insert rotated 180°

 884



Hybrid cable, 2x connector insert rotated 180°

 886



1.5 mm² motor cables

 888



SinCos cables

 889



EnDat 2.1 cables

 890

Accessories



General accessories

 891



Fuse sets for connection boxes

 893

Connection boxes

8CVE28000HC00.00-1



- Remote power distribution up to 30 kW using up to four hybrid cable outlets
- Safeguards the DC bus
- Diagnostics for all connections
- Integrated connections for local I/O nodes

ETHERNET 
POWERLINK

General information

Status indicators	Safety status, interface status
Cooling and mounting method	Cold plate mounting
Certification	
CE	Yes
cULus	Yes
FSC	Yes

DC bus connection ¹⁾

Voltage	
Nominal	750 VDC
Design	
DC+, DC-, PE	Cage clamp terminal block
Shield connection	Yes (via cable gland)
Terminal connection cross sections	
Flexible and fine wire lines	
With wire end sleeves	0.25 to 10 mm ²
Approbation data	
UL/C-UL-US	24 to 8
CSA	24 to 8
Terminal cross sections (cable diameter)	14 to 21 mm (M32 cable grommet)
Max. cable length	30 m

24 VDC supply ¹⁾

Quantity	2
Input voltage	24 VDC -25% / +20%
Max. power consumption ²⁾	In preparation
Design	
24 VDC, COM, PE	Cage clamp terminal block
Shield connection	No
Terminal connection cross sections	
Flexible and fine wire lines	
With wire end sleeves	0.25 to 10 mm ²
Approbation data	
UL/C-UL-US	24 to 8
CSA	24 to 8
Terminal cross sections (cable diameter)	14 to 21 mm (M32 cable grommet)
Max. cable length	30 m

Hybrid cable outlets

Quantity	4 (each with DC bus, 24 VDC, 2x enable, POWERLINK)
DC+ and DC- fuse protection	
Type ³⁾	Blow-out fuse conforming to UL/CSA, Ø 10 x 38 mm
Tripping characteristic	Fast-acting
Rated current of fuse depending on the ambient temperature	
40°C	In preparation
60°C	20 A
24 VDC fuse protection	
Type	Blade fuses conforming to UL/CSA
Tripping characteristic	Fast-acting
Rated current of fuse depending on the ambient temperature	
40°C	In preparation
60°C	15 A

8CVE28000HC00.00-1

Continuous power depending on the rated current of fuse ⁴⁾	
DC+ and DC- 20 A	10.1 kW
24 VDC 15 A	240 W
Continuous current depending on the rated current of fuse	
DC+ and DC- 20 A	13.5 A _{eff}
24 VDC 15 A	10.1 A
Reduction of continuous power depending on the installation elevation	
Starting at 500 m above sea level	10% per 1000 m
Power loss with continuous power	
DC+ and DC- 20 A	In preparation
24 VDC 15 A	In preparation
Protective measures	
Overload protection	
DC+ and DC- 24 VDC	No (overload status can be retrieved via fieldbus) ⁵⁾
Short circuit and ground fault protection	
DC+ and DC- 24 VDC	Yes
24 VDC	Yes
Max. cable length	30 m
Design	19-pin male hybrid connector ⁶⁾
24 VDC output	
Quantity	2
Output voltage	Depends on the 24 VDC supply
Continuous current	Max. 8 A (max. 4 A per pin)
Fuse protection per pin	
Type	Blade fuses conforming to UL/CSA
Tripping characteristic	Fast-acting
Rated current of fuse depending on the ambient temperature	
40°C	5 A
60°C	7.5 A
Protective measures	
Overload protection	No (overload status can be retrieved via fieldbus) ⁵⁾
Short circuit protection	Yes
Design	
24 VDC, COM	Female M8 connector
Fieldbus	
Type	POWERLINK (V1/V2) 100 Base-T (ANSI/IEE 802.3)
Design	2x internal 4x hub; 4x 19-pin hybrid connectors; 4x female M12 connectors
Cable length	Max. 100 m between two stations (segment length) ⁷⁾
Transfer rate	100 Mbit/s
Enable inputs	
Quantity	2
Input voltage	
Nominal	24 VDC
Maximum	30 VDC

Connection boxes

8CVE28000HC00.00-1

Input current at nominal voltage	Max. 0.5 A
Design	Cage clamp terminal block
Terminal connection cross sections	
Flexible and fine wire lines with wire end sleeves, with a plastic sleeve	0.25 to 1.5 mm ²
Approbation data	
UL/C-UL-US	26 to 12
CSA	-
Terminal cross sections (cable diameter)	5 to 9 mm (M16 cable grommet)
Max. cable length	30 m
Operating conditions	
Permitted mounting orientations	
Hanging vertically	Yes
Lying horizontally	Yes
Standing horizontally	Yes
Installation at elevations above sea level	
Nominal	0 to 500 m
Maximum ⁸⁾	4000 m
Degree of pollution in accordance with EN 60664-1	2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999	III
EN 60529 protection	IP65 ⁹⁾
Environmental conditions	
Temperature	
Operation	
Nominal	5 to 40°C ¹⁰⁾
Maximum ¹¹⁾	60°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
Mechanical characteristics	
Dimensions ¹²⁾	
Width	293 mm
Height	328 mm
Depth	80 mm
Weight	7 kg

¹⁾ Caution! Power for 8CVE remote connection boxes must be supplied by an ACOPOSmulti drive system (8BVE expansion module)!

²⁾ Power consumption refers to the 24 VDC2 input since this supplies the module.

³⁾ For a cable with 15 A rated current, KLKD020 fuses from Littlefuse must be used.

⁴⁾ Continuous power and continuous current are valid under the following conditions: nominal DC bus voltage 750 VDC, 40°C ambient temperature, installation elevation <500 m above sea level. The values listed take into consideration a reserve of 48% (recommended by fuse manufacturer) of the rated current (for a max. ambient temperature of 60°C).

⁵⁾ In preparation

⁶⁾ It is important to note that the 19-pin hybrid connector is designed for max. 5 connection cycles.

⁷⁾ Limited to 30 m when using hybrid cables.

⁸⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

⁹⁾ The specified level of protection is only in place if all connectors on the module that are not being used are closed with suitable caps or covers. Suitable caps and covers are available as optional accessories (X67AC0M08, X67AC0M12, 8CXC000.0000-00). The module is rated at IP20 when delivered.

¹⁰⁾ The temperature of the module's mounting surface is not permitted to exceed 60°C.

¹¹⁾ The module must be connected to a cooling surface (frame of the machine) at ambient temperatures over 40°C.

¹²⁾ These dimensions refer to the actual device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

EnDat 2.1 inverter modules

8CVI045E1HCS0.00-1, 8CVI088E1HCS0.00-1



- Uncontrolled and safe stops integrated
- EnDat 2.1 encoder connection
- Integrated connections for local I/O nodes
- Reduced cabling (daisy chain)

ETHERNET 
POWERLINK

General information	8CVI045E1HCS0.00-1	8CVI088E1HCS0.00-1
Module type	ACOPOSremote module	
Cooling and mounting method	Cold plate mounting	
Certification		
CE		Yes
cULus		Yes
FSC	Yes	-
DC bus connection	8CVI045E1HCS0.00-1	8CVI088E1HCS0.00-1
Voltage		
Nominal		750 VDC
Continuous power consumption ¹⁾		In preparation
Power loss depending on the switching frequency		
Switching frequency 5 kHz		In preparation
Switching frequency 10 kHz		In preparation
Switching frequency 20 kHz		In preparation
DC bus capacitance		35 µF
Design		19-pin male hybrid connector ²⁾
Cable length		
Maximum		30 m
24 VDC supply	8CVI045E1HCS0.00-1	8CVI088E1HCS0.00-1
Input voltage		24 VDC +20% / -25%
Input capacitance		In preparation
Max. power consumption	10 W + P _{24 V Out} + P _{HoldingBrake} + P _{Trigger} ³⁾	10 W + P _{24 V out} + P _{Holding brake} + P _{Trigger} ³⁾
Design		19-pin male hybrid connector ²⁾
Cable length		
Maximum		30 m
24 VDC output	8CVI045E1HCS0.00-1	8CVI088E1HCS0.00-1
Quantity		1
Output voltage		Depends on the 24 VDC supply
Continuous current		Max. 8 A (max. 4 A per pin)
Protection		Electronic (per pin)
Design		
24 VDC, COM		M8 connector
Motor connection	8CVI045E1HCS0.00-1	8CVI088E1HCS0.00-1
Quantity		1
Continuous power per motor connection ¹⁾	1.5 kW	4 kW
Continuous current per motor connection ¹⁾	4.5 A _{eff}	8.8 A _{eff}
Reduction of continuous current depending on the switching frequency ⁴⁾		
Switching frequency 5 kHz		No reduction ⁵⁾
Switching frequency 10 kHz		No reduction
Switching frequency 20 kHz		No reduction
Reduction of continuous current depending on the installation elevation		
Starting at 500 m above sea level	0.45 A per 1000 m	0.88 A per 1000 m
Peak current	13.5 A _{eff}	24.5 A _{eff}
Nominal switching frequency		5 kHz
Possible switching frequencies ⁶⁾		5 / 10 / 20 kHz
Electrical stress of the connected motor in accordance with IEC TS 60034-25 ⁷⁾		Limit value curve A
Protective measures		
Overload protection		Yes
Short circuit and ground fault protection		Yes

EnDat 2.1 inverter modules

8CVI045E1HCS0.00-1, 8CVI088E1HCS0.00-1

Max. output frequency	598 Hz ⁸⁾	
Design		
U, V, W, PE	8-pin speedtec connector, size 1	
Shield connection	Yes (via connector housing)	
Max. motor line length depending on the switching frequency		
Switching frequency 5 kHz	10 m	
Switching frequency 10 kHz	5 m	
Switching frequency 20 kHz	5 m	
Motor holding brake connection	8CVI045E1HCS0.00-1	8CVI088E1HCS0.00-1
Quantity	1	
Output voltage ⁹⁾	24 VDC +5.8% / -0%	
Continuous current	1.1 A	
Max. internal resistance	In preparation	
Extinction potential	Approx. 30 V	
Max. extinction energy per switching operation	1.5 Ws	
Max. switching frequency	0.5 Hz	
Protective measures		
Overload and short circuit protection	Yes	
Open line monitoring	Yes	
Undervoltage monitoring	Yes	
Response threshold for open line monitoring	Approx. 0.25 A	
Response threshold for undervoltage monitoring	24 VDC +0% / -4%	
Fieldbus	8CVI045E1HCS0.00-1	8CVI088E1HCS0.00-1
Type	POWERLINK (V1/V2) 100 Base-T (ANSI/IEE 802.3)	
Design	Internal 3x hub, 2x 19-pin hybrid connector, 1x M12 connector	
Cable length	Max. 100 m between two stations (segment length) ¹⁰⁾	
Transfer rate	100 Mbit/s	
Encoder inputs	8CVI045E1HCS0.00-1	8CVI088E1HCS0.00-1
Quantity	1	
Type	EnDat 2.1	
Module-side connection	15-pin female springtec connector	
Status indicators	UP/DN LEDs	
Electrical isolation		
Encoder - ACOPOSremote	No	
Encoder monitoring	Yes	
Max. encoder cable length	10 m	
Encoder supply		
Output voltage	5 V ±5%	
Load capability	250 mA ¹¹⁾	
Sense lines	2, compensation of max. 2x 0.7 V	
Protective measures		
Overload protection	Yes	
Short circuit protection	Yes	
Sine/Cosine inputs		
Signal transmission	Differential signals, symmetrical	
Signal frequency (-3 dB)	DC up to 300 kHz	
Signal frequency (-5 dB)	DC up to 400 kHz	
Differential voltage	0.5 to 1.25 V _{ss}	
Common-mode voltage	Max. ±7 V	
Terminating resistor	120 Ω	
Resolution	12-bit	

8CVI045E1HCS0.00-1, 8CVI088E1HCS0.00-1

Reference input		
Signal transmission	Differential signal, symmetrical	
Differential voltage for low	≤ -0.2 V	
Differential voltage for high	≥ 0.2 V	
Common-mode voltage	Max. ±7 V	
Terminating resistor	120 Ω	
Position		
Resolution @ 1 V _{SS} ¹²⁾	Number of encoder lines * 5700	
Precision ¹³⁾	-	
Noise ¹³⁾	-	
Synchronous serial interface		
Signal transmission	RS485	
Data transfer rate	Depends on the configured functionality ¹⁴⁾	
Enable inputs	8CVI045E1HCS0.00-1	8CVI088E1HCS0.00-1
Quantity	2	
Wiring	Sink	
Electrical isolation		
Input - Inverter module	Yes	
Input - Input	Yes	
Input voltage		
Nominal	24 VDC	
Maximum	30 VDC	
Input current at nominal voltage	Approx. 30 mA	
Switching threshold		
Low	<5 V	
High	>15 V	
Switching delay at nominal input voltage		
Enable 1 -> 0, PWM off	Max. 20.5 ms	
Enable 0 -> 1, ready for PWM	Max. 100 μs	
Modulation compared to ground potential	Max. ±38 V	
OSSD signal connections ¹⁵⁾	permitted Max. test pulse length: 500 μs	
Design	19-pin male hybrid connector ²⁾	
Trigger inputs	8CVI045E1HCS0.00-1	8CVI088E1HCS0.00-1
Quantity	2	
Wiring	Sink	
Electrical isolation		
Input - Inverter module	No	
Input - Input	No	
Input voltage		
Nominal	24 VDC	
Maximum	30 VDC	
Switching threshold		
Low	<5 V	
High	>15 V	
Input current at nominal voltage	In preparation	
Switching delay		
Rising edge	In preparation	
Falling edge	In preparation	
Modulation compared to ground potential	In preparation	
Max. cable length	30 m	
Design	M8 connector	

EnDat 2.1 inverter modules

8CVI045E1HCS0.00-1, 8CVI088E1HCS0.00-1

Operating conditions	8CVI045E1HCS0.00-1	8CVI088E1HCS0.00-1
Permitted mounting orientations		
Hanging vertically		Yes
Lying horizontally		Yes
Standing horizontally		Yes
Installation at elevations above sea level		
Nominal		0 to 500 m
Maximum ¹⁶⁾		4000 m
Degree of pollution in accordance with EN 60664-1		2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999		III
EN 60529 protection ¹⁷⁾	IP65	IP65 ¹⁷⁾
Environmental conditions	8CVI045E1HCS0.00-1	8CVI088E1HCS0.00-1
Temperature		
Operation		
Nominal		5 to 40°C ¹⁸⁾
Maximum		60°C
Storage		-25 to 55°C
Transport		-25 to 70°C
Relative humidity		
Operation		5 to 85%, non-condensing
Storage		5 to 95%, non-condensing
Transport		Max. 95% at 40°C
Mechanical characteristics	8CVI045E1HCS0.00-1	8CVI088E1HCS0.00-1
Dimensions ¹⁹⁾		
Width		137 mm
Height		287.2 mm
Depth		131 mm
Weight		4.8 kg

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ It is important to note that the 19-pin hybrid connector is designed for max. 5 connection cycles.

³⁾ The power consumption $P_{24V_{Out}}$ corresponds to the portion of the power that is output on the X31 connector on the module.

⁴⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁵⁾ Value for the nominal switching frequency.

⁶⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁷⁾ If necessary, the stress of the motor isolation system can be reduced by an additional externally wired dv/dt choke. For example, the RWK 305 three-phase dv/dt choke from Schaffner (www.schaffner.com) can be used. Important: Even when using a dv/dt choke, it is necessary to ensure that an EMC-compatible, low inductance shield connection is used!

⁸⁾ The module's electrical output frequency (SCTRL_SPEED_ACT * MOTOR_POLEPAIRS) is monitored to protect against dual use in accordance with EC regulation 428/2009 | 3A225. If the electrical output frequency of the module exceeds the limit value of 598 Hz uninterrupted for more than 0.5 s, then the current movement is aborted and error 6060 is output (Power element: Limit speed exceeded).

⁹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

¹⁰⁾ Limited to 30 m when using hybrid cables.

¹¹⁾ An additional reserve of 57 mA exists for terminating resistors.

¹²⁾ This value does not correspond to the encoder resolution that must be configured in Automation Studio (16384 * number of encoder lines).

¹³⁾ Limited by the encoder in practice.

¹⁴⁾ EnDat 2.1 ... 781.25 kbit/s; SSI ... 100 to 400 kbit/s; BiSS ... 1560 kbit/s.

¹⁵⁾ OSSD (open signal switching device) signals are used to monitor signal lines for short circuits and cross faults.

¹⁶⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

¹⁷⁾ The specified level of protection is only in place if all connectors on the module that are not being used are closed with suitable caps or covers. Suitable caps and covers are available as optional accessories (X67AC0M08, X67AC0M12, 8CX000.0000-00). The module is rated at IP20 when delivered.

¹⁸⁾ The temperature of the module's mounting surface is not permitted to exceed 60°C.

¹⁹⁾ The dimensions refer to the actual device dimensions. Make sure to leave additional space above and below the devices for mounting and connections.

HIPERFACE inverter modules

8CVI045H1HCS0.00-1, 8CVI088H1HCS0.00-1



- Uncontrolled and safe stops integrated
- HIPERFACE encoder connection
- Integrated connections for local I/O nodes
- Reduced cabling (daisy chain)

ETHERNET 
POWERLINK

General information	8CVI045H1HCS0.00-1	8CVI088H1HCS0.00-1
Module type	ACOPOSremote module	
Cooling and mounting method	Cold plate mounting	
Certification		
CE	Yes	
cULus	Yes	
FSC	Yes	-
DC bus connection	8CVI045H1HCS0.00-1	8CVI088H1HCS0.00-1
Voltage		
Nominal	750 VDC	
Continuous power consumption ¹⁾	In preparation	
Power loss depending on the switching frequency		
Switching frequency 5 kHz	In preparation	
Switching frequency 10 kHz	In preparation	
Switching frequency 20 kHz	In preparation	
DC bus capacitance	35 µF	
Design	19-pin male hybrid connector ²⁾	
Cable length		
Maximum	30 m	
24 VDC supply	8CVI045H1HCS0.00-1	8CVI088H1HCS0.00-1
Input voltage	24 VDC +20% / -25%	
Input capacitance	In preparation	
Max. power consumption	10 W + P _{24 V out} + P _{Holding brake} + P _{Trigger} ³⁾	
Design	19-pin male hybrid connector ²⁾	
Cable length		
Maximum	30 m	
24 VDC output	8CVI045H1HCS0.00-1	8CVI088H1HCS0.00-1
Quantity	1	
Output voltage	Depends on the 24 VDC supply	
Continuous current	Max. 8 A (max. 4 A per pin)	
Protection	Electronic (per pin)	
Design		
24 VDC, COM	M8 connector	
Motor connection	8CVI045H1HCS0.00-1	8CVI088H1HCS0.00-1
Quantity	1	
Continuous power per motor connection ¹⁾	1.5 kW	4 kW
Continuous current per motor connection ¹⁾	4.5 A _{eff}	8.8 A _{eff}
Reduction of continuous current depending on the switching frequency ⁴⁾		
Switching frequency 5 kHz	No reduction ⁵⁾	
Switching frequency 10 kHz	No reduction	
Switching frequency 20 kHz	No reduction	
Reduction of continuous current depending on the installation elevation		
Starting at 500 m above sea level	0.45 A per 1000 m	0.88 A per 1000 m
Peak current	13.5 A _{eff}	24.5 A _{eff}
Nominal switching frequency	5 kHz	
Possible switching frequencies ⁶⁾	5 / 10 / 20 kHz	
Electrical stress of the connected motor in accordance with IEC TS 60034-25 ⁷⁾	Limit value curve A	
Protective measures		
Overload protection	Yes	
Short circuit and ground fault protection	Yes	

HIPERFACE inverter modules

8CVI045H1HCS0.00-1, 8CVI088H1HCS0.00-1

Max. output frequency	598 Hz ⁸⁾	
Design		
U, V, W, PE	8-pin speedtec connector, size 1	
Shield connection	Yes (via connector housing)	
Max. motor line length depending on the switching frequency		
Switching frequency 5 kHz	10 m	
Switching frequency 10 kHz	5 m	
Switching frequency 20 kHz	5 m	
Motor holding brake connection	8CVI045H1HCS0.00-1	8CVI088H1HCS0.00-1
Quantity	1	
Output voltage ⁹⁾	24 VDC +5.8% / -0%	
Continuous current	1.1 A	
Max. internal resistance	In preparation	
Extinction potential	Approx. 30 V	
Max. extinction energy per switching operation	1.5 Ws	
Max. switching frequency	0.5 Hz	
Protective measures		
Overload and short circuit protection	Yes	
Open line monitoring	Yes	
Undervoltage monitoring	Yes	
Response threshold for open line monitoring	Approx. 0.25 A	
Response threshold for undervoltage monitoring	24 VDC +0% / -4%	
Fieldbus	8CVI045H1HCS0.00-1	8CVI088H1HCS0.00-1
Type	POWERLINK (V1/V2) 100 Base-T (ANSI/IEE 802.3)	
Design	Internal 3x hub, 2x 19-pin hybrid connector, 1x M12 connector	
Cable length	Max. 100 m between two stations (segment length) ¹⁰⁾	
Transfer rate	100 Mbit/s	
Encoder inputs	8CVI045H1HCS0.00-1	8CVI088H1HCS0.00-1
Quantity	1	
Type	HIPERFACE	
Module-side connection	15-pin female springtec connector	
Status indicators	UP/DN LEDs	
Electrical isolation		
Encoder - ACOPOSremote	No	
Encoder monitoring	Yes	
Max. encoder cable length	10 m	
Encoder supply		
Output voltage	Typ. 10 V	
Load capability	130 mA ¹¹⁾	
Sense lines	-	
Protective measures		
Overload protection	Yes	
Short circuit protection	Yes	
Sine/Cosine inputs		
Signal transmission	Differential signal, asymmetrical	
Signal frequency	DC up to 200 kHz	
Differential voltage	0.5 to 1.25 V _{SS}	
Common-mode voltage	Max. ±7 V	
Terminating resistor	120 Ω	
Resolution	12-bit	
Position		
Resolution @ 1 V _{SS} ¹²⁾	Number of encoder lines * 5700	
Precision ¹³⁾	-	
Noise ¹³⁾	-	

8CVI045H1HCS0.00-1, 8CVI088H1HCS0.00-1

Asynchronous serial interface		
Signal transmission		RS485
Data transfer rate		9600 bit/s
Enable inputs	8CVI045H1HCS0.00-1	8CVI088H1HCS0.00-1
Quantity		2
Wiring		Sink
Electrical isolation		
Input - Inverter module		Yes
Input - Input		Yes
Input voltage		
Nominal		24 VDC
Maximum		30 VDC
Input current at nominal voltage		Approx. 30 mA
Switching threshold		
Low		<5 V
High		>15 V
Switching delay at nominal input voltage		
Enable 1 -> 0, PWM off		Max. 20.5 ms
Enable 0 -> 1, ready for PWM		Max. 100 µs
Modulation compared to ground potential		Max. ±38 V
OSSD signal connections ¹⁴⁾		permitted Max. test pulse length: 500 µs
Design		19-pin male hybrid connector ²⁾
Trigger inputs	8CVI045H1HCS0.00-1	8CVI088H1HCS0.00-1
Quantity		2
Wiring		Sink
Electrical isolation		
Input - Inverter module		No
Input - Input		No
Input voltage		
Nominal		24 VDC
Maximum		30 VDC
Switching threshold		
Low		<5 V
High		>15 V
Input current at nominal voltage		In preparation
Switching delay		
Rising edge		In preparation
Falling edge		In preparation
Modulation compared to ground potential		In preparation
Max. cable length		30 m
Design		M8 connector
Sensor/Actuator supply		
Voltage		24 VDC
Summation current		Max. 250 mA ¹⁵⁾
Operating conditions	8CVI045H1HCS0.00-1	8CVI088H1HCS0.00-1
Permitted mounting orientations		
Hanging vertically		Yes
Lying horizontally		Yes
Standing horizontally		Yes
Installation at elevations above sea level		
Nominal		0 to 500 m
Maximum ¹⁶⁾		4000 m
Degree of pollution in accordance with EN 60664-1		2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999		III
EN 60529 protection		IP65 ¹⁷⁾

HIPERFACE inverter modules

8CVI045H1HCS0.00-1, 8CVI088H1HCS0.00-1

Environmental conditions	8CVI045H1HCS0.00-1	8CVI088H1HCS0.00-1
Temperature		
Operation		
Nominal		5 to 40°C ¹⁸⁾
Maximum		60°C
Storage		-25 to 55°C
Transport		-25 to 70°C
Relative humidity		
Operation		5 to 85%, non-condensing
Storage		5 to 95%, non-condensing
Transport		Max. 95% at 40°C
Mechanical characteristics	8CVI045H1HCS0.00-1	8CVI088H1HCS0.00-1
Dimensions ¹⁹⁾		
Width		137 mm
Height		287.2 mm
Depth		131 mm
Weight		4.8 kg

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ It is important to note that the 19-pin hybrid connector is designed for max. 5 connection cycles.

³⁾ The power consumption $P_{24V_{Out}}$ corresponds to the portion of the power that is output on the X31 connector on the module.

⁴⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁵⁾ Value for the nominal switching frequency.

⁶⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁷⁾ If necessary, the stress of the motor isolation system can be reduced by an additional externally wired dv/dt choke. For example, the RWK 305 three-phase dv/dt choke from Schaffner (www.schaffner.com) can be used. Important: Even when using a dv/dt choke, it is necessary to ensure that an EMC-compatible, low inductance shield connection is used!

⁸⁾ The module's electrical output frequency (SCTRL_SPEED_ACT * MOTOR_POLEPAIRS) is monitored to protect against dual use in accordance with EC regulation 428/2009 | 3A225. If the electrical output frequency of the module exceeds the limit value of 598 Hz uninterrupted for more than 0.5 s, then the current movement is aborted and error 6060 is output (Power element: Limit speed exceeded).

⁹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

¹⁰⁾ Limited to 30 m when using hybrid cables.

¹¹⁾ An additional reserve of 40 mA exists for terminating resistors.

¹²⁾ This value does not correspond to the encoder resolution that must be configured in Automation Studio (16384 * number of encoder lines).

¹³⁾ Limited by the encoder in practice.

¹⁴⁾ OSSD (open signal switching device) signals are used to monitor signal lines for short circuits and cross faults.

¹⁵⁾ The summation current corresponds to the current that is output on the X23A and X24A connectors on the module.

¹⁶⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

¹⁷⁾ The specified level of protection is only in place if all connectors on the module that are not being used are closed with suitable caps or covers. Suitable caps and covers are available as optional accessories (X67AC0M08, X67AC0M12, 8CXC000.0000-00). The module is rated at IP20 when delivered.

¹⁸⁾ The temperature of the module's mounting surface is not permitted to exceed 60°C.

¹⁹⁾ The dimensions refer to the actual device dimensions. Make sure to leave additional space above and below the devices for mounting and connections.

SinCos inverter modules

8CVI045S1HCS0.00-1, 8CVI088S1HCS0.00-1



- Uncontrolled and safe stops integrated
- SinCos encoder connection
- Integrated connections for local I/O nodes
- Simplified wiring

ETHERNET 
POWERLINK

General information	8CVI045S1HCS0.00-1	8CVI088S1HCS0.00-1
Module type	ACOPOSremote module	
Cooling and mounting method	Cold plate mounting	
Certification		
CE		Yes
cULus		Yes
FSC	Yes	-
DC bus connection	8CVI045S1HCS0.00-1	8CVI088S1HCS0.00-1
Voltage		
Nominal		750 VDC
Continuous power consumption ¹⁾		In preparation
Power loss depending on the switching frequency		
Switching frequency 5 kHz		In preparation
Switching frequency 10 kHz		In preparation
Switching frequency 20 kHz		In preparation
DC bus capacitance		35 µF
Design		19-pin male hybrid connector ²⁾
Cable length		
Maximum		30 m
24 VDC supply	8CVI045S1HCS0.00-1	8CVI088S1HCS0.00-1
Input voltage		24 VDC +20% / -25%
Input capacitance		In preparation
Max. power consumption		10 W + P _{24 V out} + P _{Holding brake} + P _{Trigger} ³⁾
Design		19-pin male hybrid connector ²⁾
Cable length		
Maximum		30 m
24 VDC output	8CVI045S1HCS0.00-1	8CVI088S1HCS0.00-1
Quantity		1
Output voltage		Depends on the 24 VDC supply
Continuous current		Max. 8 A (max. 4 A per pin)
Protection		Electronic (per pin)
Design		
24 VDC, COM		M8 connector
Motor connection	8CVI045S1HCS0.00-1	8CVI088S1HCS0.00-1
Quantity		1
Continuous power per motor connection ¹⁾	1.5 kW	4 kW
Continuous current per motor connection ¹⁾	4.5 A _{eff}	8.8 A _{eff}
Reduction of continuous current depending on the switching frequency ⁴⁾		
Switching frequency 5 kHz		No reduction ⁵⁾
Switching frequency 10 kHz		No reduction
Switching frequency 20 kHz		No reduction
Reduction of continuous current depending on the installation elevation		
Starting at 500 m above sea level	0.45 A per 1000 m	0.88 A per 1000 m
Peak current	13.5 A _{eff}	24.5 A _{eff}
Nominal switching frequency		5 kHz
Possible switching frequencies ⁶⁾		5 / 10 / 20 kHz
Electrical stress of the connected motor in accordance with IEC TS 60034-25 ⁷⁾		Limit value curve A
Protective measures		
Overload protection		Yes
Short circuit and ground fault protection		Yes
Max. output frequency		598 Hz ⁸⁾

SinCos inverter modules

8CVI045S1HCS0.00-1, 8CVI088S1HCS0.00-1

Design		
U, V, W, PE	8-pin speedtec connector, size 1	
Shield connection	Yes (via connector housing)	
Max. motor line length depending on the switching frequency		
Switching frequency 5 kHz	10 m	
Switching frequency 10 kHz	5 m	
Switching frequency 20 kHz	5 m	
Motor holding brake connection	8CVI045S1HCS0.00-1	8CVI088S1HCS0.00-1
Quantity	1	
Output voltage ⁹⁾	24 VDC +5.8% / -0%	
Continuous current	1.1 A	
Max. internal resistance	In preparation	
Extinction potential	Approx. 30 V	
Max. extinction energy per switching operation	1.5 Ws	
Max. switching frequency	0.5 Hz	
Protective measures		
Overload and short circuit protection	Yes	
Open line monitoring	Yes	
Undervoltage monitoring	Yes	
Response threshold for open line monitoring	Approx. 0.25 A	
Response threshold for undervoltage monitoring	24 VDC +0% / -4%	
Fieldbus	8CVI045S1HCS0.00-1	8CVI088S1HCS0.00-1
Type	POWERLINK (V1/V2) 100 Base-T (ANSI/IEE 802.3)	
Design	Internal 3x hub, 2x 19-pin hybrid connector, 1x M12 connector	
Cable length	Max. 100 m between two stations (segment length) ¹⁰⁾	
Transfer rate	100 Mbit/s	
Encoder inputs	8CVI045S1HCS0.00-1	8CVI088S1HCS0.00-1
Quantity	1	
Type	SinCos	
Module-side connection	15-pin female springtec connector	
Status indicators	UP/DN LEDs	
Electrical isolation		
Encoder - ACOPOSremote	No	
Encoder monitoring	Yes	
Max. encoder cable length	10 m	
Encoder supply		
Output voltage	5 V ±5%	
Load capability	300 mA ¹¹⁾	
Sense lines	2, compensation of max. 2 x 0.7 V	
Protective measures		
Overload protection	Yes	
Short circuit protection	Yes	
Sine/Cosine inputs		
Signal transmission	Differential signals, symmetrical	
Signal frequency (-3 dB)	DC up to 300 kHz	
Signal frequency (-5 dB)	DC up to 400 kHz	
Differential voltage	0.5 to 1.25 V _{ss}	
Common-mode voltage	Max. ±7 V	
Terminating resistor	120 Ω	
ADC resolution	12-bit	

8CVI045S1HCS0.00-1, 8CVI088S1HCS0.00-1

Reference input		
Signal transmission	Differential signal, symmetrical	
Differential voltage for low	≤ -0.2 V	
Differential voltage for high	≥ 0.2 V	
Common-mode voltage	Max. ±7 V	
Terminating resistor	120 Ω	
Position		
Resolution @ 1 V _{SS} ¹²⁾	Number of encoder lines * 5700	
Precision ¹³⁾	-	
Noise ¹³⁾	-	
Limit switch inputs¹⁴⁾		
Quantity	2	
Wiring	Source	
Input resistance	1470 Ω	
Electrical isolation		
Input - ACOPOSremote	No	
Input - Input	No	
Input voltage		
Minimum	-12 V	
Nominal	5 V	
Maximum	20 V	
Switching threshold		
Low	<0.8 V	
High	>2 V	
Switching delay	Max. 100 μs	
Enable inputs	8CVI045S1HCS0.00-1	8CVI088S1HCS0.00-1
Quantity	2	
Wiring	Sink	
Electrical isolation		
Input - Inverter module	Yes	
Input - Input	Yes	
Input voltage		
Nominal	24 VDC	
Maximum	30 VDC	
Input current at nominal voltage	Approx. 30 mA	
Switching threshold		
Low	<5 V	
High	>15 V	
Switching delay at nominal input voltage		
Enable 1 -> 0, PWM off	Max. 20.5 ms	
Enable 0 -> 1, ready for PWM	Max. 100 μs	
Modulation compared to ground potential	Max. ±38 V	
OSSD signal connections ¹⁵⁾	permitted	
Design	Max. test pulse length: 500 μs	
	19-pin male hybrid connector ²⁾	

SinCos inverter modules

8CVI045S1HCS0.00-1, 8CVI088S1HCS0.00-1

Trigger inputs	8CVI045S1HCS0.00-1	8CVI088S1HCS0.00-1
Quantity		2
Wiring		Sink
Electrical isolation		
Input - Inverter module		No
Input - Input		No
Input voltage		
Nominal		24 VDC
Maximum		30 VDC
Switching threshold		
Low		<5 V
High		>15 V
Input current at nominal voltage		In preparation
Switching delay		
Rising edge		In preparation
Falling edge		In preparation
Modulation compared to ground potential		In preparation
Max. cable length		30 m
Design		M8 connector
Sensor/Actuator supply		
Voltage		24 VDC
Summation current		Max. 250 mA ¹⁶⁾
Operating conditions	8CVI045S1HCS0.00-1	8CVI088S1HCS0.00-1
Permitted mounting orientations		
Hanging vertically		Yes
Lying horizontally		Yes
Standing horizontally		Yes
Installation at elevations above sea level		
Nominal		0 to 500 m
Maximum ¹⁷⁾		4000 m
Degree of pollution in accordance with EN 60664-1		2 (non-conductive pollution)
Overvoltage category in accordance with IEC 60364-4-443:1999		III
EN 60529 protection		IP65 ¹⁸⁾
Environmental conditions	8CVI045S1HCS0.00-1	8CVI088S1HCS0.00-1
Temperature		
Operation		
Nominal		5 to 40°C ¹⁹⁾
Maximum		60°C
Storage		-25 to 55°C
Transport		-25 to 70°C
Relative humidity		
Operation		5 to 85%, non-condensing
Storage		5 to 95%, non-condensing
Transport		Max. 95% at 40°C

8CVI045S1HCS0.00-1, 8CVI088S1HCS0.00-1

Mechanical characteristics	8CVI045S1HCS0.00-1	8CVI088S1HCS0.00-1
Dimensions ²⁰⁾		
Width		137 mm
Height		287.2 mm
Depth		131 mm
Weight		4.8 kg

¹⁾ Valid in the following conditions: 750 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.

²⁾ It is important to note that the 19-pin hybrid connector is designed for max. 5 connection cycles.

³⁾ The power consumption $P_{24V_{Out}}$ corresponds to the portion of the power that is output on the X31 connector on the module.

⁴⁾ Valid in the following conditions: 750 VDC DC bus voltage. The temperature specifications refer to the ambient temperature.

⁵⁾ Value for the nominal switching frequency.

⁶⁾ B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load.

⁷⁾ If necessary, the stress of the motor isolation system can be reduced by an additional externally wired dv/dt choke. For example, the RWK 305 three-phase dv/dt choke from Schaffner (www.schaffner.com) can be used. Important: Even when using a dv/dt choke, it is necessary to ensure that an EMC-compatible, low inductance shield connection is used!

⁸⁾ The module's electrical output frequency (SCTRL_SPEED_ACT * MOTOR_POLEPAIRS) is monitored to protect against dual use in accordance with EC regulation 428/2009 | 3A225. If the electrical output frequency of the module exceeds the limit value of 598 Hz uninterrupted for more than 0.5 s, then the current movement is aborted and error 6060 is output (Power element: Limit speed exceeded).

⁹⁾ During project development, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified wiring. The operating voltage range of the holding brake can be found in the user's manual for the respective motor.

¹⁰⁾ Limited to 30 m when using hybrid cables.

¹¹⁾ An additional reserve of 12 mA exists for terminating resistors and limit switch inputs.

¹²⁾ This value does not correspond to the encoder resolution that must be configured in Automation Studio (16384 * number of encoder lines).

¹³⁾ Limited by the encoder in practice.

¹⁴⁾ The measurement system offered by Heidenhain with limit switch outputs LIDA 47x, LIDA 48x and LIF4x1 was tested for compatibility. In practice, the cable length is limited by the encoder.

¹⁵⁾ OSSD (open signal switching device) signals are used to monitor signal lines for short circuits and cross faults.

¹⁶⁾ The summation current corresponds to the current that is output on the X23A and X24A connectors on the module.

¹⁷⁾ Continuous operation at elevations ranging from 500 m to 4000 m above sea level is possible (taking the specified continuous current reductions into consideration). Requirements that go above and beyond this must be arranged with B&R.

¹⁸⁾ The specified level of protection is only in place if all connectors on the module that are not being used are closed with suitable caps or covers. Suitable caps and covers are available as optional accessories (X67AC0M08, X67AC0M12, 8CXC000.0000-00). The module is rated at IP20 when delivered.

¹⁹⁾ The temperature of the module's mounting surface is not permitted to exceed 60°C.

²⁰⁾ The dimensions refer to the actual device dimensions. Make sure to leave additional space above and below the devices for mounting and connections.

8BVE / 8CVI connection cables

Technical data



8CCH0005.11120-1

8CCH0007.11120-1

8CCH0010.11120-1

General information

Cable cross section	5x 2.5 mm ² + 4x 0.75 mm ² + 2x 2x 0.34 mm ² / 1.55- 100 LI
Listed	UL AWM Style 20234, 80°C, 1000 V as well as CSA C22.2 No. 210.2 I/II A/B, FT1
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	5
Wire insulation	Special thermoplastic material
Wire colors	Black, red, green, white, yellow/green
Design	Tinned copper stranded wire
Diameter	2.5 mm ²
Shield	No
Stranding	No
Signal lines	
Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Pink, blue, violet, gray
Design	Tinned copper stranded wire
Diameter	0.75 mm ²
Shield	No
Stranding	No
Data lines	
Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Orange, white, yellow, blue
Design	Tinned copper stranded wire
Diameter	0.34 mm ²
Shield	Yes
Stranding	Yes
Cable stranding	With filler elements and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR
Labeling	In preparation
Connector	
Type	15-pin female hybrid connector
Connection cycles	>50
Contacts	15
Additional connectors	POWERLINK RJ45 male connector
EN 60529 protection	IP65

Technical data

8CCH0005.11120-1

8CCH0007.11120-1

8CCH0010.11120-1

Electrical characteristics

Operating voltage		Power lines: ≤ 1000 V Signal lines: ≤ 1000 V Data lines: ≤ 100 V	
Current load		In preparation	
Conductor resistance			
Power lines	$\leq 0.04 \Omega$	$\leq 0.06 \Omega$	$\leq 0.08 \Omega$
Signal lines	$\leq 0.13 \Omega$	$\leq 0.18 \Omega$	$\leq 0.26 \Omega$
Data lines	$\leq 0.28 \Omega$	$\leq 0.39 \Omega$	$\leq 0.56 \Omega$
Insulation resistance	$> 100 \text{ G}\Omega$	$> 71.43 \text{ G}\Omega$	$> 50 \text{ G}\Omega$

Mechanical characteristics

Dimensions			
Length	5 m	7 m	10 m
Diameter	14.6 mm ± 0.4 mm		
Flex radius			
Single bend	> 40 mm		
Moving	≥ 140 mm		
Weight	1.95 kg	2.74 kg	3.72 kg

Hybrid cables

Technical data



8CCH0001.11110-1

8CCH0002.11110-1

8CCH0003.11110-1

8CCH0004.11110-1

8CCH0005.11110-1

General information

Cable cross section	5x 2.5 mm ² + 4x 0.75 mm ² + 2x 2x 0.34 mm ² / 1.55- 100 LI
Listed	UL AWM Style 20234, 80°C, 1000 V as well as CSA C22.2 No. 210.2 I/II A/B, FT1
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	5
Wire insulation	Special thermoplastic material
Wire colors	Black, red, green, white, yellow/green
Design	Tinned copper stranded wire
Diameter	2.5 mm ²
Shield	No
Stranding	No
Signal lines	
Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Pink, blue, violet, gray
Design	Tinned copper stranded wire
Diameter	0.75 mm ²
Shield	No
Stranding	No
Data lines	
Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Orange, white, yellow, blue
Design	Tinned copper stranded wire
Diameter	0.34 mm ²
Shield	Yes
Stranding	Yes
Cable stranding	With filler elements and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR
Labeling	In preparation

Connector

Type	15-pin female hybrid connector
Connection cycles	>50
Contacts	15
EN 60529 protection	IP65

Technical data

8CCH0001.11110-1

8CCH0002.11110-1

8CCH0003.11110-1

8CCH0004.11110-1

8CCH0005.11110-1

Electrical characteristics

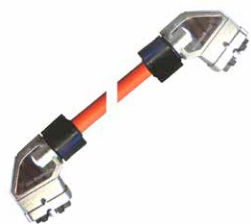
Operating voltage	Power lines: ≤ 1000 V Signal lines: ≤ 1000 V Data lines: ≤ 100 V				
Current load	In preparation				
Conductor resistance					
Power lines	$\leq 0.008 \Omega$	$\leq 0.02 \Omega$	$\leq 0.02 \Omega$	$\leq 0.03 \Omega$	$\leq 0.04 \Omega$
Signal lines	$\leq 0.03 \Omega$	$\leq 0.05 \Omega$	$\leq 0.08 \Omega$	$\leq 0.1 \Omega$	$\leq 0.13 \Omega$
Data lines	$\leq 0.06 \Omega$	$\leq 0.11 \Omega$	$\leq 0.17 \Omega$	$\leq 0.22 \Omega$	$\leq 0.28 \Omega$
Insulation resistance	> 500 G Ω	> 250 G Ω	> 166.67 G Ω	> 125 G Ω	> 100 G Ω

Mechanical characteristics

Dimensions					
Length	1 m	2 m	3 m	4 m	5 m
Diameter	14.6 mm ± 0.4 mm				
Flex radius					
Single bend	> 40 mm				
Moving	≥ 140 mm				
Weight	0.82 kg	1.1 kg	1.55 kg	1.73 kg	2 kg

Hybrid cables, 1x connector insert rotated 180°

Technical data



8CCH0001.11130-1

8CCH0002.11130-1

8CCH0003.11130-1

8CCH0004.11130-1

8CCH0005.11130-1

General information

Cable cross section	5x 2.5 mm ² + 4x 0.75 mm ² + 2x 2x 0.34 mm ² / 1.55- 100 LI
Short description	Connector insert in hybrid connector rotated 180° degrees
Listed	UL AWM Style 20234, 80°C, 1000 V as well as CSA C22.2 No. 210.2 I/II A/B, FT1
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	5
Wire insulation	Special thermoplastic material
Wire colors	Black, red, green, white, yellow/green
Design	Tinned copper stranded wire
Diameter	2.5 mm ²
Shield	No
Stranding	No
Signal lines	
Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Pink, blue, violet, gray
Design	Tinned copper stranded wire
Diameter	0.75 mm ²
Shield	No
Stranding	No
Data lines	
Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Orange, white, yellow, blue
Design	Tinned copper stranded wire
Diameter	0.34 mm ²
Shield	Yes
Stranding	Yes
Cable stranding	With filler elements and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR
Labeling	In preparation
Connector	
Type	15-pin female hybrid connector
Connection cycles	>50
Contacts	15
EN 60529 protection	IP65

Technical data

8CCH0001.11130-1

8CCH0002.11130-1

8CCH0003.11130-1

8CCH0004.11130-1

8CCH0005.11130-1

Electrical characteristics

Operating voltage	Power lines: ≤ 1000 V Signal lines: ≤ 1000 V Data lines: ≤ 100 V				
Current load	In preparation				
Conductor resistance					
Power lines	$\leq 0.008 \Omega$	$\leq 0.02 \Omega$		$\leq 0.03 \Omega$	$\leq 0.04 \Omega$
Signal lines	$\leq 0.03 \Omega$	$\leq 0.05 \Omega$	$\leq 0.08 \Omega$	$\leq 0.1 \Omega$	$\leq 0.13 \Omega$
Data lines	$\leq 0.06 \Omega$	$\leq 0.11 \Omega$	$\leq 0.17 \Omega$	$\leq 0.22 \Omega$	$\leq 0.28 \Omega$
Insulation resistance	> 500 G Ω	> 250 G Ω	> 166.67 G Ω	> 125 G Ω	> 100 G Ω

Mechanical characteristics

Dimensions					
Length	1 m	2 m	3 m	4 m	5 m
Diameter	14.6 mm ± 0.4 mm				
Flex radius					
Single bend	> 40 mm				
Moving	≥ 140 mm				
Weight	0.79 kg	1.11 kg	1.44 kg	1.73 kg	2 kg

Hybrid cables, 2x connector insert rotated 180°

Technical data



8CCH0001.11230-1

8CCH0002.11230-1

8CCH0003.11230-1

8CCH0004.11230-1

8CCH0005.11230-1

General information

Cable cross section	5x 2.5 mm ² + 4x 0.75 mm ² + 2x 2x 0.34 mm ² / 1.55- 100 LI
Short description	Connector insert in both hybrid connectors rotated 180° degrees
Listed	UL AWM Style 20234, 80°C, 1000 V as well as CSA C22.2 No. 210.2 I/II A/B, FT1
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	5
Wire insulation	Special thermoplastic material
Wire colors	Black, red, green, white, yellow/green
Design	Tinned copper stranded wire
Diameter	2.5 mm ²
Shield	No
Stranding	No
Signal lines	
Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Pink, blue, violet, gray
Design	Tinned copper stranded wire
Diameter	0.75 mm ²
Shield	No
Stranding	No
Data lines	
Quantity	4
Wire insulation	Special thermoplastic material
Wire colors	Orange, white, yellow, blue
Design	Tinned copper stranded wire
Diameter	0.34 mm ²
Shield	Yes
Stranding	Yes
Cable stranding	With filler elements and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR
Labeling	In preparation
Connector	
Type	15-pin female hybrid connector
Connection cycles	>50
Contacts	15
EN 60529 protection	IP65

Technical data

8CCH0001.11230-1

8CCH0002.11230-1

8CCH0003.11230-1

8CCH0004.11230-1

8CCH0005.11230-1

Electrical characteristics

Operating voltage	Power lines: ≤ 1000 V Signal lines: ≤ 1000 V Data lines: ≤ 100 V				
Current load	In preparation				
Conductor resistance					
Power lines	$\leq 0.008 \Omega$	$\leq 0.02 \Omega$		$\leq 0.03 \Omega$	$\leq 0.04 \Omega$
Signal lines	$\leq 0.03 \Omega$	$\leq 0.05 \Omega$	$\leq 0.08 \Omega$	$\leq 0.1 \Omega$	$\leq 0.13 \Omega$
Data lines	$\leq 0.06 \Omega$	$\leq 0.11 \Omega$	$\leq 0.17 \Omega$	$\leq 0.22 \Omega$	$\leq 0.28 \Omega$
Insulation resistance	$> 500 \text{ G}\Omega$	$> 250 \text{ G}\Omega$	$> 166.67 \text{ G}\Omega$	$> 125 \text{ G}\Omega$	$> 100 \text{ G}\Omega$

Mechanical characteristics

Dimensions					
Length	1 m	2 m	3 m	4 m	5 m
Diameter	14.6 mm ± 0.4 mm				
Flex radius					
Single bend	> 40 mm				
Moving	≥ 140 mm				
Weight	0.82 kg	1.1 kg	1.55 kg	1.73 kg	2 kg

1.5 mm² motor cables

Technical data



8CCM0001.11110-0

8CCM0002.11110-0

8CCM0003.11110-0

8CCM0004.11110-0

8CCM0005.11110-0

General information

Listed	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Power lines	
Quantity	4
Wire colors	Black, brown, blue, yellow/green
Design	Tinned copper stranded wire
Diameter	1.5 mm ²
Shield	No
Signal lines	
Quantity	4
Wire colors	White, white/red, white/blue, white/green
Design	Tinned copper stranded wire
Diameter	0.75 mm ²
Shield	Separate shielding for pairs, tinned copper braiding, optical coverage >85% and foil banding
Complete shielding	Tinned copper braiding, optical coverage >85% and wrapped in isolating film
Outer sheathing	
Material	PUR

Connector

Type	8-pin female speedtec connector
Additional connectors	8-pin male speedtec coupling
EN 60529 protection	IP67 when connected

Electrical characteristics

Max. current load in accordance with IEC 60364-5-523 by installation type	
Wall mounting	20 A
Installed in conduit or cable duct	17.8 A
Installed in cable tray	20.9 A

Mechanical characteristics

Dimensions					
Length	1 m	2 m	3 m	4 m	5 m
Diameter	12.8 mm ±0.4 mm				
Flex radius					
Single bend	>40 mm				
Moving	≥99 mm				
Drag chain data					
Acceleration	<60 m/s ²				
Flex cycles ¹⁾	≥3,000,000				
Speed	≤4 m/s				
Weight	0.5 kg	0.77 kg	1.03 kg	1.29 kg	1.5 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 125 mm.

Technical data



8CCS0001.11110-0

8CCS0002.11110-0

8CCS0003.11110-0

8CCS0004.11110-0

8CCS0005.11110-0

General information

Listed	UL AWM Style 20963, 80°C, 30 V, E63216 and CSA AWM I/II A/B, 90°C, 30 V, FT1 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Supply lines	
Quantity	2
Wire colors	White/Green, white/red
Design	Tinned copper stranded wire
Diameter	0.5 mm ²
Shield	No
Signal lines	
Quantity	10
Wire colors	Blue, brown, yellow, gray, green, pink, red, black, violet, white
Design	Tinned copper stranded wire
Diameter	0.14 mm ²
Shield	No
Complete shielding	Copper braiding, optical coverage >85% and wrapped in foil shield
Outer sheathing	
Material	PUR

Connector

Type	12-pin female springtec connector
Additional connectors	15-pin male springtec connector Connection cycles: >50 Contacts: 15
EN 60529 protection	IP67 when connected

Mechanical characteristics

Dimensions					
Length	1 m	2 m	3 m	4 m	5 m
Diameter	7.85 mm ±0.2 mm				
Flex radius					
Single bend	≥24 mm				
Moving	≥60 mm				
Drag chain data					
Acceleration	<60 m/s ²				
Flex cycles ¹⁾	≥3,000,000				
Speed	≤4 m/s				
Weight	0.24 kg	0.32 kg	0.4 kg	0.48 kg	0.56 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 65 mm.

EnDat 2.1 cables

Technical data



8CCE0001.11210-0

8CCE0002.11210-0

8CCE0003.11210-0

8CCE0004.11210-0

8CCE0005.11210-0

General information

Listed	UL AWM Style 20963, 80°C, 30 V, E63216 and CSA AWM I/II A/B, 90°C, 30 V, FT1 LL46064
Certification	
CE	Yes
cULus	Yes

Cable construction

Supply lines	
Quantity	2
Wire colors	White/Green, white/red
Design	Tinned copper stranded wire
Diameter	0.5 mm ²
Shield	No
Signal lines	
Quantity	10
Wire colors	Blue, brown, yellow, gray, green, pink, red, black, violet, white
Design	Tinned copper stranded wire
Diameter	0.14 mm ²
Shield	No
Complete shielding	Copper braiding, optical coverage >85% and wrapped in foil shield
Outer sheathing	
Material	PUR

Connector

Type	17-pin female speedtec connector
Additional connectors	15-pin male springtec connector Connection cycles: >50 Contacts: 15 signal contacts Protection in accordance with EN 60529: IP67 when connected
EN 60529 protection	IP67 when connected

Mechanical characteristics

Dimensions					
Length	1 m	2 m	3 m	4 m	5 m
Diameter	7.85 mm ±0.2 mm				
Flex radius					
Single bend	≥24 mm				
Moving	≥60 mm				
Drag chain data					
Acceleration	<60 m/s ²				
Flex cycles ¹⁾	≥3,000,000				
Speed	≤4 m/s				
Weight	0.2 kg	0.28 kg	0.4 kg	0.44 kg	0.53 kg

¹⁾ At an ambient temperature of 20°C and a flex radius of 65 mm.

General accessories

8CXC000.0000-00



General information

Short description	Accessory set: 1x slot cover for male hybrid connector
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Certification CE	Yes
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Mechanical characteristics

Weight	24 g
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8CXC001.0000-00



General information

Short description	Accessory fuse set for 8CVE connection box: 2x bridge, 2-pin, fully isolated, 10 mm, rated current: 57 A
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Certification CE	Yes
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Mechanical characteristics

Weight	11 g
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General accessories

8CXM000.0000-00, 8CXM000.0002-00, 8CXM000.0005-00, 8CXM000.000A-00



General information	8CXM000.0000-00	8CXM000.0002-00	8CXM000.0005-00	8CXM000.000A-00
Short description	Accessory set for 8CVI inverter modules: 4x M6x80 mm hex socket head screw	Accessory set for 8CVI inverter modules: 20x M6x80 mm hex socket head screw	Accessory set for 8CVI inverter modules: 52x M6x80 mm hex socket head screw	Accessory set for 8CVI inverter modules: 100x M6x80 mm hex socket head screw
Mechanical characteristics	8CXM000.0000-00	8CXM000.0002-00	8CXM000.0005-00	8CXM000.000A-00
Weight	77 g	382 g	1011 g	1886 g

8CXM001.0000-00, 8CXM001.0002-00, 8CXM001.0005-00, 8CXM001.000A-00



General information	8CXM001.0000-00	8CXM001.0002-00	8CXM001.0005-00	8CXM001.000A-00
Short description	Accessory set for 8CVE connection boxes: 4x M6x25 mm hex socket head screw	Accessory set for 8CVE connection boxes: 20x M6x25 mm hex socket head screw	Accessory set for 8CVE connection boxes: 52x M6x25 mm hex socket head screw	Accessory set for 8CVE connection boxes: 100x M6x25 mm hex socket head screw
Mechanical characteristics	8CXM001.0000-00	8CXM001.0002-00	8CXM001.0005-00	8CXM001.000A-00
Weight	30 g	143 g	413 g	752 g

Fuse sets for 8CVE connection boxes

8CXS000.0000-00



General information

Short description

Fuse set for 8CVE connection box:
8x fuses for hybrid cable outputs, DC+ and DC-

Type: Blow-out fuse conforming to UL/CSA, Ø 10 x 38 mm
Rated current: 20 A
Tripping characteristic: Fast-acting

Certification

CE

Yes

Mechanical characteristics

Weight

68 g

8CXS001.0000-00, 8CXS001.0002-00, 8CXS001.0005-00, 8CXS001.000A-00



General information

Short description

8CXS001.0000-00
Fuse set for 8CVE connection box:
4 fuses for 24 VDC outputs

Type: Blade-type fuses conforming to UL/CSA
Rated current: 7.5 A
Tripping characteristic: Fast-acting

8CXS001.0002-00
Fuse set for 8CVE connection box:
20 fuses for 24 VDC outputs

Type: Blade-type fuses conforming to UL/CSA
Rated current: 7.5 A
Tripping characteristic: Fast-acting

8CXS001.0005-00
Fuse set for 8CVE connection box:
52 fuses for 24 VDC outputs

Type: Blade-type fuses conforming to UL/CSA
Rated current: 7.5 A
Tripping characteristic: Fast-acting

8CXS001.000A-00
Fuse set for 8CVE connection box:
100 fuses for 24 VDC outputs

Type: Blade-type fuses conforming to UL/CSA
Rated current: 7.5 A
Tripping characteristic: Fast-acting

Certification

CE

Yes

Mechanical characteristics

Weight

7 g

35 g

91 g

175 g

8CXS002.0000-00, 8CXS002.0002-00, 8CXS002.0005-00, 8CXS002.000A-00



General information

Short description

8CXS002.0000-00
Fuse set for 8CVE connection box:
4x fuses for hybrid cable outputs, 24 VDC

Type: Blade-type fuses conforming to UL/CSA
Rated current: 15 A
Tripping characteristic: Fast-acting

8CXS002.0002-00
Fuse set for 8CVE connection box:
20x fuses for hybrid cable outputs, 24 VDC

Type: Blade-type fuses conforming to UL/CSA
Rated current: 15 A
Tripping characteristic: Fast-acting

8CXS002.0005-00
Fuse set for 8CVE connection box:
52x fuses for hybrid cable outputs, 24 VDC

Type: Blade-type fuses conforming to UL/CSA
Rated current: 15 A
Tripping characteristic: Fast-acting

8CXS002.000A-00
Fuse set for 8CVE connection box:
100x fuses for hybrid cable outputs, 24 VDC

Type: Blade-type fuses conforming to UL/CSA
Rated current: 15 A
Tripping characteristic: Fast-acting

Certification

CE

Yes

Mechanical characteristics

Weight

7 g

35 g

91 g

175 g



ACOPOSinverter

Frequency inverters

The ACOPOSinverter combines intelligence with efficiency, thus enabling higher performance for industrial machines.

Even though ACOPOSinverter systems have reduced energy consumption and lower maintenance costs, they continue to effectively protect systems while increasing competitiveness at the same time.

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Product overview

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Mains chokes for ACOPOSinverter P74

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ACOPOSinverter P84



3-phase ACOPOSinverter P84, 200 to 240 V

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3-phase ACOPOSinverter P84, 380 to 480 V

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Accessories for ACOPOSinverter P84



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Graphics displays for ACOPOSinverter P74 and P84

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System features

ACOPOSinverter P74

The ACOPOSinverter P74 frequency inverter includes various drive profiles for three-phase induction motors and synchronous motors with a voltage supply from 200 to 500 V and a power rating from 0.18 to 15 kW. The combination of an ACOPOSinverter P74 and a synchronous motor without an encoder is very compact and therefore helps to significantly reduce the overall size and cost of a machine.

Applications

- Material handling (small conveyor belts, freight elevators, etc.)
- Packaging machines (small labeling machines, small bag packaging machines, etc.)
- Special-purpose machines (mixing machines, kneading machines, textile machines, etc.)
- Pumps, compressors, fans
- Freight elevators
- Woodworking (automatic lathes, saws, milling machines, etc.)
- Metal machining and processing (bending presses, welding machines, cutting machines, etc.)



Functions

- Brake control
- Load distribution
- Limit switch management
- Current limitation
- Torque limiting
- Parameter set switching
- Motor switching
- PID controllers
- Automatic alignment of rotational loads with rotary speed detection (alignment during operation)
- Undervoltage management
- High-speed cutoff, etc.

Power range for 50 to 60 Hz (kW) mains supply

0.18 to 15

1-phase, 200 to 240 V (kW)

0.18 to 2.2

3-phase, 380 to 500 V (kW)

0.37 to 15

Drive

Output frequency

0.1 to 599 Hz

Type of closed-loop control

Induction motor

Flux vector control without encoder, voltage/frequency ratio - V/f characteristic curve (2 or 5 points), pump/fan profile (quadratic curve Kn^2), energy saving profile (especially for ventilation)

Synchronous motor

Vector control without speed feedback

Short-term overload torque

170 to 200% of the rated motor torque

Functions

Number of functions

150

Safety functions

Integrated

STO (Safe Torque Off), SLS (Safely Limited Speed), SS1 (Safe Stop 1)

Number of inputs/outputs

Analog inputs

3

Logic inputs

6

Analog outputs

1

Logic outputs

1

Relay outputs

2

Communication

Integrated

POWERLINK

ACOPOSinverter P84

The ACOPOSinverter P84 is a frequency inverter for three-phase induction motors with a voltage supply from 200 to 480 V and a power rating from 0.37 to 75 kW.

Because of its wide performance range and many integrated functions, the ACOPOSinverter P84 can fulfill the most challenging requirements of complex machines.

Applications

- Material handling (palletizers / depalletizers, cardboard packaging machines, labeling machines, conveyor belts, roll lifting equipment, etc.)
- Packaging (palletizers / depalletizers, cardboard packaging machines, labeling machines, etc.)
- Textiles (weaving machines, carding machines, washing machines, spin dryers, ribbon lap machines, etc.)
- Woodworking (automatic lathes, saws, milling)
- High inertia systems (centrifuges, mixers, asymmetrical machines (beam pumps, presses), etc.)
- Process systems / Material handling

Functions

- Brake control
- Load distribution
- Limit switch management
- Current limitation
- Torque control
- Parameter set switching
- Motor switching
- PID controllers
- Automatic alignment of rotational loads with rotary speed detection (alignment during operation)
- Undervoltage management
- High-speed cutoff, etc.



Power range for 50 to 60 Hz (kW) mains supply

0.37 to 75

1-phase, 200 to 240 V (kW)	0.37 to 5.5
3-phase, 200 to 240 V (kW)	0.37 to 45
3-phase, 380 to 480 V (kW)	0.75 to 75

Drive

Output frequency	1 to 500 Hz over the entire range 1 to 599 Hz up to 37 kW at 200 to 240 V and 380 to 480 V
Type of closed-loop control	AC motor control Flux vector control with or without an encoder, voltage/frequency ratio - V/F curve (2 or 5 points), ENA system
Short-term overload torque	220% of the rated motor torque for 2 seconds 170% for 60 seconds

Functions

Number of functions	>150
Number of inputs/outputs	
Analog inputs	2
Logic inputs	6
Analog outputs	1
Logic outputs	-
Relay outputs	2

Communication

Integrated POWERLINK

Cards (available as options)

Interface boards for incremental encoders

1-phase ACOPOSinverter P74, 200 to 240 V

8I74S200018.01P-1, 8I74S200037.01P-1, 8I74S200055.01P-1



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CANopen

Motor power	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Listed on nameplate	0.18 kW (0.25 HP)	0.37 kW (0.5 HP)	0.55 kW (0.75 HP)
Power mains connector	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Mains input voltage	1x 200 VAC -15% to 240 VAC +10%		
Frequency	50 to 60 Hz ±5%		
Starting current	Max. 9.6 A ¹⁾		
Mains current			
At 200 VAC	3.4 A ²⁾	6 A ²⁾	7.9 A ²⁾
At 240 VAC	2.8 A ²⁾	5 A ²⁾	6.7 A ²⁾
Integrated EMC filter	Yes ³⁾		
Line-conducted and radiated emissions	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
With integrated filter			
Motor cable length in accordance with IEC/ EN 61800-3		-	
Cat. C1 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		10 m ⁴⁾	
Cat. C2 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		10 m ⁴⁾	
Cat. C3 environment 2 (industrial mains)			
With add-on filter	8I0FS009.200-2		
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3		20 m ⁴⁾	
Cat. C1 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		50 m ⁴⁾	
Cat. C2 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		50 m ⁴⁾	
Cat. C3 environment 2 (industrial mains)			
Motor connection	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Nominal output current	1.5 A ⁵⁾	3.3 A ⁵⁾	3.7 A ⁵⁾
Max. transient current for 60 s	2.3 A	5 A	5.6 A
Max. transient current for 2 s	2.5 A	5.5 A	6.1 A
Output frequency range	0.1 to 599 Hz		
Nominal clock frequency	4 kHz		
Clock frequency			
Min.	2 kHz		
Max.	16 kHz		
Motor closed loop control profiles			
Induction motor		Flux vector control without an encoder Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) Pump/Fan profile (quadratic curve Kn ²) Energy saving profile (especially for ventilation)	
Synchronous motor		Vector control without speed feedback	
Brake chopper	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Integrated dynamic brake transistors	Yes		
Min. resistance value (external)	40 Ω		
24 VDC supply	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Input voltage	24 VDC (-15%/+20%)		
Current	Max. 1.1 A		

8I74S200018.01P-1, 8I74S200037.01P-1, 8I74S200055.01P-1

Available internal power supplies	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Output voltage 10 VDC		10 VDC (-0%/+10%)	
Output voltage 10 VDC			
Max. output current at 10 VDC		10 mA	
Interfaces	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Type		POWERLINK and CANopen	
Digital inputs	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Quantity		6 ⁶⁾	
Nominal voltage		24 VDC (max. 30 V)	
Input circuit		Source or sink	
Input circuit			
Current consumption		7 mA	
Digital input 5			
Max. input frequency		20 kHz	
Safe input - STO (Safe Torque Off)	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Quantity		1	
Nominal voltage		24 VDC	
Input impedance		1.5 kΩ	
Input impedance			
Current consumption		16 mA	
Switching threshold			
Low		<2 V	
High		>17 V	
Electrical isolation			
Input - ACOPOSinverter		Yes	
Input - Input		No	
Input circuit		Sink	
Sampling time		4 ms	
Analog inputs	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Quantity		3	
Input			
Voltage		0 to 10 V, ±10 V	
Current		0 to 20 mA (or 4 to 20 mA)	
Resolution		10-bit	
Digital outputs	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Quantity		1	
Nominal voltage		24 VDC	
Max. voltage		30 VDC	
Output circuit		Source or sink	
Sampling time		2 ms	
Max. current		100 mA	
Relay outputs	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		R1, with a resistive load (cos phi = 1): 3 A at 250 VAC, R1, with a resistive load (cos phi = 1): 4 A at 30 VDC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 250 VAC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 30 VDC, R2, with a resistive load (cos phi = 1): 5 A at 250 VAC, R2, with a resistive load (cos phi = 1): 5 A at 30 VDC	
Design			
Relay 1		1 changeover contact	
Relay 2		1 normally open contact	
Response time (max.)		2 ms	

1-phase ACOPOSinverter P74, 200 to 240 V

8I74S200018.01P-1, 8I74S200037.01P-1, 8I74S200055.01P-1

Analog outputs	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Quantity		1	
Output		0 to 10 V or 0 to 20 mA	
Resolution		10-bit	
Operating conditions	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
EN 60529 protection		IP20	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1		2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3		Class 3C3 and 3S3	
Operating position		Vertical installation $\pm 10\%$	
Environmental conditions	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Temperature			
Operation		-10 to 50°C without derating 50 to 60°C with derating	
Mechanical characteristics	8I74S200018.01P-1	8I74S200037.01P-1	8I74S200055.01P-1
Dimensions ⁷⁾			
Width		45 mm	
Height		317 mm	
Depth		245 mm	

¹⁾ Peak current when switching on for maximum voltage (240 V +10% or 500 V +10%)

²⁾ Typical value for 4-pole motor and a max. clock frequency of 4 kHz, without mains choke for the max. assumed short circuit current (I_{sc}).

³⁾ Inverter supplied with an integrated Category C2 EMC filter. This filter can be turned off.

⁴⁾ The selection table for the filters specifies the maximum length of the shielded cables between motors and inverters. These maximum cable lengths only serve as a reference point since they depend on the capacity of the motors and the cables being used. The total length should be taken into consideration when motors are connected in parallel. These values apply at a rated clock frequency of 4 kHz.

⁵⁾ These values apply at a rated clock frequency of 4 kHz during continuous operation. The clock frequency can be set from 2 to 16 kHz. Above 4 kHz, reduce the rated drive current. The motor current is not permitted to exceed this value.

⁶⁾ 1 logic input can be programmed as a 20 kbps pulse input. 1 logic input is configurable as an input for a PTC sensor using a switch (SW2). Trigger resistance 3 k Ω , reset value 1.8 k Ω , short circuit protection <50 Ω

⁷⁾ With shield plate

8I74S200075.01P-1, 8I74S200110.01P-1



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CANopen®

Motor power	8I74S200075.01P-1	8I74S200110.01P-1
Listed on nameplate	0.75 kW (1 HP)	1.1 kW (1 ^{1/2} HP)
Power mains connector	8I74S200075.01P-1	8I74S200110.01P-1
Mains input voltage	1x 200 VAC -15% to 240 VAC +10%	
Frequency	50 to 60 Hz ±5%	
Starting current	Max. 9.6 A ¹⁾	Max. 19.1 A ¹⁾
Mains current		
At 200 VAC	10.1 A ²⁾	13.6 A ²⁾
At 240 VAC	8.5 A ²⁾	11.5 A ²⁾
Integrated EMC filter		Yes ³⁾
Line-conducted and radiated emissions	8I74S200075.01P-1	8I74S200110.01P-1
With integrated filter		
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		-
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		10 m ⁴⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		10 m ⁴⁾
With add-on filter	8I0FS009.200-2	8I0FS016.200-1
With add-on filter		
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		20 m ⁴⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		50 m ⁴⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		50 m ⁴⁾
Motor connection	8I74S200075.01P-1	8I74S200110.01P-1
Nominal output current	4.8 A ⁵⁾	6.9 A ⁵⁾
Max. transient current for 60 s	7.2 A	10.4 A
Max. transient current for 2 s	7.9 A	11.4 A
Output frequency range	0.1 to 599 Hz	
Nominal clock frequency	4 kHz	
Clock frequency		
Min.	2 kHz	
Max.	16 kHz	
Motor closed loop control profiles		
Induction motor	Flux vector control without an encoder Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) Pump/Fan profile (quadratic curve K _n ²) Energy saving profile (especially for ventilation)	
Synchronous motor	Vector control without speed feedback	
Brake chopper	8I74S200075.01P-1	8I74S200110.01P-1
Integrated dynamic brake transistors		Yes
Min. resistance value (external)	40 Ω	27 Ω
24 VDC supply	8I74S200075.01P-1	8I74S200110.01P-1
Input voltage	24 VDC (-15%/+20%)	
Current	Max. 1.1 A	

1-phase ACOPOSinverter P74, 200 to 240 V

8I74S200075.01P-1, 8I74S200110.01P-1

Available internal power supplies	8I74S200075.01P-1	8I74S200110.01P-1
Output voltage 10 VDC	10 VDC (-0%/+10%)	
Output voltage 10 VDC Max. output current at 10 VDC	10 mA	
Interfaces	8I74S200075.01P-1	8I74S200110.01P-1
Type	POWERLINK and CANopen	
Digital inputs	8I74S200075.01P-1	8I74S200110.01P-1
Quantity	6 ⁶⁾	
Nominal voltage	24 VDC (max. 30 V)	
Input circuit	Source or sink	
Input circuit Current consumption	7 mA	
Digital input 5 Max. input frequency	20 kHz	
Safe input - STO (Safe Torque Off)	8I74S200075.01P-1	8I74S200110.01P-1
Quantity	1	
Nominal voltage	24 VDC	
Input impedance	1.5 kΩ	
Input impedance Current consumption	16 mA	
Switching threshold Low High	<2 V >17 V	
Electrical isolation Input - ACOPOSinverter Input - Input	Yes No	
Input circuit	Sink	
Sampling time	4 ms	
Analog inputs	8I74S200075.01P-1	8I74S200110.01P-1
Quantity	3	
Input Voltage Current	0 to 10 V, ±10 V 0 to 20 mA (or 4 to 20 mA)	
Resolution	10-bit	
Digital outputs	8I74S200075.01P-1	8I74S200110.01P-1
Quantity	1	
Nominal voltage	24 VDC	
Max. voltage	30 VDC	
Output circuit	Source or sink	
Sampling time	2 ms	
Max. current	100 mA	
Relay outputs	8I74S200075.01P-1	8I74S200110.01P-1
Quantity	2	
Nominal voltage	30 VDC / 250 VAC	
Switching capacity	R1, with a resistive load (cos phi = 1): 3 A at 250 VAC, R1, with a resistive load (cos phi = 1): 4 A at 30 VDC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 250 VAC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 30 VDC, R2, with a resistive load (cos phi = 1): 5 A at 250 VAC, R2, with a resistive load (cos phi = 1): 5 A at 30 VDC	
Design Relay 1 Relay 2	1 changeover contact 1 normally open contact	
Response time (max.)	2 ms	

8I74S200075.01P-1, 8I74S200110.01P-1

Analog outputs	8I74S200075.01P-1	8I74S200110.01P-1
Quantity	1	
Output	0 to 10 V or 0 to 20 mA	
Resolution	10-bit	
Operating conditions	8I74S200075.01P-1	8I74S200110.01P-1
EN 60529 protection	IP20	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1	2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3	Class 3C3 and 3S3	
Operating position	Vertical installation $\pm 10\%$	
Environmental conditions	8I74S200075.01P-1	8I74S200110.01P-1
Temperature		
Operation	-10 to 50°C without derating 50 to 60°C with derating	
Mechanical characteristics	8I74S200075.01P-1	8I74S200110.01P-1
Dimensions ⁷⁾		
Width	45 mm	60 mm
Height		317 mm
Depth		245 mm

¹⁾ Peak current when switching on for maximum voltage (240 V +10% or 500 V +10%)

²⁾ Typical value for 4-pole motor and a max. clock frequency of 4 kHz, without mains choke for the max. assumed short circuit current (Isc).

³⁾ Inverter supplied with an integrated Category C2 EMC filter. This filter can be turned off.

⁴⁾ The selection table for the filters specifies the maximum length of the shielded cables between motors and inverters. These maximum cable lengths only serve as a reference point since they depend on the capacity of the motors and the cables being used. The total length should be taken into consideration when motors are connected in parallel. These values apply at a rated clock frequency of 4 kHz.

⁵⁾ These values apply at a rated clock frequency of 4 kHz during continuous operation. The clock frequency can be set from 2 to 16 kHz. Above 4 kHz, reduce the rated drive current. The motor current is not permitted to exceed this value.

⁶⁾ 1 logic input can be programmed as a 20 kbps pulse input. 1 logic input is configurable as an input for a PTC sensor using a switch (SW2). Trigger resistance 3 k Ω , reset value 1.8 k Ω , short circuit protection <50 Ω

⁷⁾ With shield plate

1-phase ACOPOSinverter P74, 200 to 240 V

8I74S200150.01P-1, 8I74S200220.01P-1



ETHERNET
POWERLINK

CANopen

Motor power	8I74S200150.01P-1	8I74S200220.01P-1
Listed on nameplate	1.5 kW (2 HP)	2.2 kW (3 HP)
Power mains connector	8I74S200150.01P-1	8I74S200220.01P-1
Mains input voltage	1x 200 VAC -15% to 240 VAC +10%	
Frequency	50 to 60 Hz ±5%	
Starting current	Max. 19.1 A ¹⁾	
Mains current		
At 200 VAC	17.6 A ²⁾	23.9 A ²⁾
At 240 VAC	14.8 A ²⁾	20.1 A ²⁾
Integrated EMC filter		Yes ³⁾
Line-conducted and radiated emissions	8I74S200150.01P-1	8I74S200220.01P-1
With integrated filter		
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		-
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		10 m ⁴⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		10 m ⁴⁾
With add-on filter	8I0FS016.200-1	8I0FS022.200-1
With add-on filter		
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		20 m ⁴⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		50 m ⁴⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		50 m ⁴⁾
Motor connection	8I74S200150.01P-1	8I74S200220.01P-1
Nominal output current	8 A ⁵⁾	11 A ⁵⁾
Max. transient current for 60 s	12 A	16.5 A
Max. transient current for 2 s	13.2 A	18.2 A
Output frequency range	0.1 to 599 Hz	
Nominal clock frequency	4 kHz	
Clock frequency		
Min.	2 kHz	
Max.	16 kHz	
Motor closed loop control profiles		
Induction motor	Flux vector control without an encoder Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) Pump/Fan profile (quadratic curve Kn^2) Energy saving profile (especially for ventilation)	
Synchronous motor	Vector control without speed feedback	
Brake chopper	8I74S200150.01P-1	8I74S200220.01P-1
Integrated dynamic brake transistors		Yes
Min. resistance value (external)	27 Ω	25 Ω
24 VDC supply	8I74S200150.01P-1	8I74S200220.01P-1
Input voltage	24 VDC (-15%/+20%)	
Current	Max. 1.1 A	

8I74S200150.01P-1, 8I74S200220.01P-1

Available internal power supplies	8I74S200150.01P-1	8I74S200220.01P-1
Output voltage 10 VDC	10 VDC (-0%/+10%)	
Output voltage 10 VDC Max. output current at 10 VDC	10 mA	
Interfaces	8I74S200150.01P-1	8I74S200220.01P-1
Type	POWERLINK and CANopen	
Digital inputs	8I74S200150.01P-1	8I74S200220.01P-1
Quantity	6 ⁶⁾	
Nominal voltage	24 VDC (max. 30 V)	
Input circuit	Source or sink	
Input circuit Current consumption	7 mA	
Digital input 5 Max. input frequency	20 kHz	
Safe input - STO (Safe Torque Off)	8I74S200150.01P-1	8I74S200220.01P-1
Quantity	1	
Nominal voltage	24 VDC	
Input impedance	1.5 kΩ	
Input impedance Current consumption	16 mA	
Switching threshold Low	<2 V	
High	>17 V	
Electrical isolation Input - ACOPOSinverter	Yes	
Input - Input	No	
Input circuit	Sink	
Sampling time	4 ms	
Analog inputs	8I74S200150.01P-1	8I74S200220.01P-1
Quantity	3	
Input Voltage	0 to 10 V, ±10 V	
Current	0 to 20 mA (or 4 to 20 mA)	
Resolution	10-bit	
Digital outputs	8I74S200150.01P-1	8I74S200220.01P-1
Quantity	1	
Nominal voltage	24 VDC	
Max. voltage	30 VDC	
Output circuit	Source or sink	
Sampling time	2 ms	
Max. current	100 mA	
Relay outputs	8I74S200150.01P-1	8I74S200220.01P-1
Quantity	2	
Nominal voltage	30 VDC / 250 VAC	
Switching capacity	R1, with a resistive load (cos phi = 1): 3 A at 250 VAC, R1, with a resistive load (cos phi = 1): 4 A at 30 VDC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 250 VAC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 30 VDC, R2, with a resistive load (cos phi = 1): 5 A at 250 VAC, R2, with a resistive load (cos phi = 1): 5 A at 30 VDC	
Design Relay 1	1 changeover contact	
Relay 2	1 normally open contact	
Response time (max.)	2 ms	

1-phase ACOPOSinverter P74, 200 to 240 V

8I74S200150.01P-1, 8I74S200220.01P-1

Analog outputs	8I74S200150.01P-1	8I74S200220.01P-1
Quantity		1
Output	0 to 10 V or 0 to 20 mA	
Resolution	10-bit	
Operating conditions	8I74S200150.01P-1	8I74S200220.01P-1
EN 60529 protection	IP20	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1	2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3	Class 3C3 and 3S3	
Operating position	Vertical installation $\pm 10\%$	
Environmental conditions	8I74S200150.01P-1	8I74S200220.01P-1
Temperature		
Operation	-10 to 50°C without derating 50 to 60°C with derating	
Mechanical characteristics	8I74S200150.01P-1	8I74S200220.01P-1
Dimensions ⁷⁾		
Width	60 mm	
Height	317 mm	
Depth	245 mm	

¹⁾ Peak current when switching on for maximum voltage (240 V +10% or 500 V +10%)

²⁾ Typical value for 4-pole motor and a max. clock frequency of 4 kHz, without mains choke for the max. assumed short circuit current (I_{sc}).

³⁾ Inverter supplied with an integrated Category C2 EMC filter. This filter can be turned off.

⁴⁾ The selection table for the filters specifies the maximum length of the shielded cables between motors and inverters. These maximum cable lengths only serve as a reference point since they depend on the capacity of the motors and the cables being used. The total length should be taken into consideration when motors are connected in parallel. These values apply at a rated clock frequency of 4 kHz.

⁵⁾ These values apply at a rated clock frequency of 4 kHz during continuous operation. The clock frequency can be set from 2 to 16 kHz. Above 4 kHz, reduce the rated drive current. The motor current is not permitted to exceed this value.

⁶⁾ 1 logic input can be programmed as a 20 kbps pulse input. 1 logic input is configurable as an input for a PTC sensor using a switch (SW2). Trigger resistance 3 k Ω , reset value 1.8 k Ω , short circuit protection <50 Ω

⁷⁾ With shield plate

3-phase ACOPOSinverter P74, 380 to 500 V

8I74T400037.01P-1, 8I74T400055.01P-1, 8I74T400075.01P-1



ETHERNET 
POWERLINK

CANopen®

Motor power	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Listed on nameplate	0.37 kW (0.5 HP)	0.55 kW (0.75 HP)	0.75 kW (1 HP)
Power mains connector	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Mains input voltage	3x 380 VAC -15% to 500 VAC +10%		
Frequency	50 to 60 Hz ±5%		
Apparent power (at 500 VAC)	1.4 kVA	1.9 kVA	2.3 kVA
Starting current	Max. 10 A ¹⁾		
Mains current			
At 380 VAC	2.1 A ²⁾	2.8 A ²⁾	3.6 A ²⁾
At 500 VAC	1.6 A ²⁾	2.2 A ²⁾	2.7 A ²⁾
Integrated EMC filter	Yes ³⁾		
Line-conducted and radiated emissions	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
With integrated filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		-	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		5 m ⁴⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		5 m ⁴⁾	
With add-on filter	8IOFT015.200-1		
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		20 m ⁴⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		50 m ⁴⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		50 m ⁴⁾	
Motor connection	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Nominal output current	1.5 A ⁵⁾	1.9 A ⁵⁾	2.3 A ⁵⁾
Max. transient current for 60 s	2.3 A	2.9 A	3.5 A
Max. transient current for 2 s	2.5 A	3.1 A	3.8 A
Output frequency range	0.1 to 599 Hz		
Nominal clock frequency	4 kHz		
Clock frequency			
Min.	2 kHz		
Max.	16 kHz		
Motor closed loop control profiles			
Induction motor	Flux vector control without an encoder Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) Pump/Fan profile (quadratic curve Kn ²) Energy saving profile (especially for ventilation)		
Synchronous motor	Vector control without speed feedback		
Brake chopper	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Integrated dynamic brake transistors	Yes		
Min. resistance value (external)	80 Ω		
24 VDC supply	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Input voltage	24 VDC (-15%/+20%)		
Current	Max. 1.1 A		

3-phase ACOPOSinverter P74, 380 to 500 V

8I74T400037.01P-1, 8I74T400055.01P-1, 8I74T400075.01P-1

Available internal power supplies	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Output voltage 10 VDC		10 VDC (-0%/+10%)	
Output voltage 10 VDC Max. output current at 10 VDC		10 mA	
Interfaces	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Type		POWERLINK and CANopen	
Digital inputs	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Quantity		6 ⁶⁾	
Nominal voltage		24 VDC (max. 30 V)	
Input circuit		Source or sink	
Input circuit Current consumption		7 mA	
Digital input 5 Max. input frequency		20 kHz	
Safe input - STO (Safe Torque Off)	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Quantity		1	
Nominal voltage		24 VDC	
Input impedance		1.5 kΩ	
Input impedance Current consumption		16 mA	
Switching threshold Low High		<2 V >17 V	
Electrical isolation Input - ACOPOSinverter Input - Input		Yes No	
Input circuit		Sink	
Sampling time		4 ms	
Analog inputs	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Quantity		3	
Input Voltage Current		0 to 10 V, ±10 V 0 to 20 mA (or 4 to 20 mA)	
Resolution		10-bit	
Digital outputs	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Quantity		1	
Nominal voltage		24 VDC	
Max. voltage		30 VDC	
Output circuit		Source or sink	
Sampling time		2 ms	
Max. current		100 mA	
Relay outputs	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		R1, with a resistive load (cos phi = 1): 3 A at 250 VAC, R1, with a resistive load (cos phi = 1): 4 A at 30 VDC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 250 VAC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 30 VDC, R2, with a resistive load (cos phi = 1): 5 A at 250 VAC, R2, with a resistive load (cos phi = 1): 5 A at 30 VDC	
Design Relay 1 Relay 2		1 changeover contact 1 normally open contact	
Response time (max.)		2 ms	

8I74T400037.01P-1, 8I74T400055.01P-1, 8I74T400075.01P-1

Analog outputs	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Quantity		1	
Output		0 to 10 V or 0 to 20 mA	
Resolution		10-bit	
Operating conditions	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
EN 60529 protection		IP20	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1		2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3		Class 3C3 and 3S3	
Operating position		Vertical installation ±10%	
Environmental conditions	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Temperature			
Operation		-10 to 50°C without derating 50 to 60°C with derating	
Mechanical characteristics	8I74T400037.01P-1	8I74T400055.01P-1	8I74T400075.01P-1
Dimensions ⁷⁾			
Width		45 mm	
Height		317 mm	
Depth		245 mm	

¹⁾ Peak current when switching on for maximum voltage (240 V +10% or 500 V +10%)

²⁾ Typical value for 4-pole motor and a max. clock frequency of 4 kHz, without mains choke for the max. assumed short circuit current (I_{sc}).

³⁾ Inverter supplied with an integrated Category C2 EMC filter. This filter can be turned off.

⁴⁾ The selection table for the filters specifies the maximum length of the shielded cables between motors and inverters. These maximum cable lengths only serve as a reference point since they depend on the capacity of the motors and the cables being used. The total length should be taken into consideration when motors are connected in parallel. These values apply at a rated clock frequency of 4 kHz.

⁵⁾ These values apply at a rated clock frequency of 4 kHz during continuous operation. The clock frequency can be set from 2 to 16 kHz. Above 4 kHz, reduce the rated drive current. The motor current is not permitted to exceed this value.

⁶⁾ 1 logic input can be programmed as a 20 kbps pulse input. 1 logic input is configurable as an input for a PTC sensor using a switch (SW2). Trigger resistance 3 kΩ, reset value 1.8 kΩ, short circuit protection <50 Ω

⁷⁾ With shield plate

3-phase ACOPOSinverter P74, 380 to 500 V

8I74T400110.01P-1, 8I74T400150.01P-1, 8I74T400220.01P-1



ETHERNET 
POWERLINK

CANopen®

Motor power	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Listed on nameplate	1.1 kW (1 ^{1/2} HP)	1.5 kW (2 HP)	2.2 kW (3 HP)
Power mains connector	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Mains input voltage	3x 380 VAC -15% to 500 VAC +10%		
Frequency	50 to 60 Hz ±5%		
Apparent power (at 500 VAC)	3.3 kVA	4.2 kVA	5.7 kVA
Starting current	Max. 10 A ¹⁾		
Mains current			
At 380 VAC	5 A ²⁾	6.5 A ²⁾	8.7 A ²⁾
At 500 VAC	3.8 A ²⁾	4.9 A ²⁾	6.6 A ²⁾
Integrated EMC filter	Yes ³⁾		
Line-conducted and radiated emissions	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
With integrated filter			
Motor cable length in accordance with IEC/ EN 61800-3		-	
Cat. C1 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		5 m ⁴⁾	
Cat. C2 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		5 m ⁴⁾	
Cat. C3 environment 2 (industrial mains)			
With add-on filter	8I0FT015.200-1	8I0FT015.200-1	8I0FT025.200-1
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3		20 m ⁴⁾	
Cat. C1 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		50 m ⁴⁾	
Cat. C2 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		50 m ⁴⁾	
Cat. C3 environment 2 (industrial mains)			
Motor connection	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Nominal output current	3 A ⁵⁾	4.1 A ⁵⁾	5.5 A ⁵⁾
Max. transient current for 60 s	4.5 A	6.2 A	8.3 A
Max. transient current for 2 s	5 A	6.8 A	9 A
Output frequency range	0.1 to 599 Hz		
Nominal clock frequency	4 kHz		
Clock frequency			
Min.	2 kHz		
Max.	16 kHz		
Motor closed loop control profiles			
Induction motor	Flux vector control without an encoder Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) Pump/Fan profile (quadratic curve Kn ²) Energy saving profile (especially for ventilation)		
Synchronous motor	Vector control without speed feedback		
Brake chopper	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Integrated dynamic brake transistors	Yes		
Min. resistance value (external)	54 Ω		
24 VDC supply	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Input voltage	24 VDC (-15%/+20%)		
Current	Max. 1.1 A		

8I74T400110.01P-1, 8I74T400150.01P-1, 8I74T400220.01P-1

Available internal power supplies	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Output voltage 10 VDC		10 VDC (-0%/+10%)	
Output voltage 10 VDC Max. output current at 10 VDC		10 mA	
Interfaces	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Type		POWERLINK and CANopen	
Digital inputs	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Quantity		6 ⁶⁾	
Nominal voltage		24 VDC (max. 30 V)	
Input circuit		Source or sink	
Input circuit Current consumption		7 mA	
Digital input 5 Max. input frequency		20 kHz	
Safe input - STO (Safe Torque Off)	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Quantity		1	
Nominal voltage		24 VDC	
Input impedance		1.5 kΩ	
Input impedance Current consumption		16 mA	
Switching threshold Low		<2 V	
High		>17 V	
Electrical isolation Input - ACOPOSinverter		Yes	
Input - Input		No	
Input circuit		Sink	
Sampling time		4 ms	
Analog inputs	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Quantity		3	
Input Voltage		0 to 10 V, ±10 V	
Current		0 to 20 mA (or 4 to 20 mA)	
Resolution		10-bit	
Digital outputs	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Quantity		1	
Nominal voltage		24 VDC	
Max. voltage		30 VDC	
Output circuit		Source or sink	
Sampling time		2 ms	
Max. current		100 mA	
Relay outputs	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		R1, with a resistive load (cos phi = 1): 3 A at 250 VAC, R1, with a resistive load (cos phi = 1): 4 A at 30 VDC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 250 VAC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 30 VDC, R2, with a resistive load (cos phi = 1): 5 A at 250 VAC, R2, with a resistive load (cos phi = 1): 5 A at 30 VDC	
Design Relay 1		1 changeover contact	
Relay 2		1 normally open contact	
Response time (max.)		2 ms	

3-phase ACOPOSinverter P74, 380 to 500 V

8I74T400110.01P-1, 8I74T400150.01P-1, 8I74T400220.01P-1

Analog outputs	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Quantity		1	
Output		0 to 10 V or 0 to 20 mA	
Resolution		10-bit	
Operating conditions	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
EN 60529 protection		IP20	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1		2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3		Class 3C3 and 3S3	
Operating position		Vertical installation $\pm 10\%$	
Environmental conditions	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Temperature			
Operation		-10 to 50°C without derating 50 to 60°C with derating	
Mechanical characteristics	8I74T400110.01P-1	8I74T400150.01P-1	8I74T400220.01P-1
Dimensions ⁷⁾			
Width	45 mm	45 mm	60 mm
Height		317 mm	
Depth		245 mm	

¹⁾ Peak current when switching on for maximum voltage (240 V +10% or 500 V +10%)

²⁾ Typical value for 4-pole motor and a max. clock frequency of 4 kHz, without mains choke for the max. assumed short circuit current (I_{sc}).

³⁾ Inverter supplied with an integrated Category C2 EMC filter. This filter can be turned off.

⁴⁾ The selection table for the filters specifies the maximum length of the shielded cables between motors and inverters. These maximum cable lengths only serve as a reference point since they depend on the capacity of the motors and the cables being used. The total length should be taken into consideration when motors are connected in parallel. These values apply at a rated clock frequency of 4 kHz.

⁵⁾ These values apply at a rated clock frequency of 4 kHz during continuous operation. The clock frequency can be set from 2 to 16 kHz. Above 4 kHz, reduce the rated drive current. The motor current is not permitted to exceed this value.

⁶⁾ 1 logic input can be programmed as a 20 kbps pulse input. 1 logic input is configurable as an input for a PTC sensor using a switch (SW2). Trigger resistance 3 k Ω , reset value 1.8 k Ω , short circuit protection <50 Ω

⁷⁾ With shield plate

8I74T400300.01P-1, 8I74T400400.01P-1, 8I74T400550.01P-1



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Motor power	8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Listed on nameplate	3 kW (- HP)	4 kW (5 HP)	5.5 kW (7 ^{1/2} HP)
Power mains connector	8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Mains input voltage	3x 380 VAC -15% to 500 VAC +10%		
Frequency	50 to 60 Hz ±5%		
Apparent power (at 500 VAC)	7.3 kVA	9.1 kVA	12.6 kVA
Starting current	Max. 10 A ¹⁾	Max. 10 A ¹⁾	Max. 27.6 A ¹⁾
Mains current			
At 380 VAC	11.1 A ²⁾	13.7 A ²⁾	20.7 A ²⁾
At 500 VAC	8.4 A ²⁾	10.5 A ²⁾	14.5 A ²⁾
Integrated EMC filter		Yes ³⁾	
Line-conducted and radiated emissions	8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
With integrated filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		-	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		5 m ⁴⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		5 m ⁴⁾	
With add-on filter	8I0FT025.200-1	8I0FT025.200-1	8I0FT047.200-1
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		20 m ⁴⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		50 m ⁴⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		50 m ⁴⁾	
Motor connection	8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Nominal output current	7.1 A ⁵⁾	9.5 A ⁵⁾	14.3 A ⁵⁾
Max. transient current for 60 s	10.7 A	14.3 A	21.5 A
Max. transient current for 2 s	11.7 A	15.7 A	23.6 A
Output frequency range	0.1 to 599 Hz		
Nominal clock frequency	4 kHz		
Clock frequency			
Min.	2 kHz		
Max.	16 kHz		
Motor closed loop control profiles			
Induction motor		Flux vector control without an encoder Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) Pump/Fan profile (quadratic curve Kn ²) Energy saving profile (especially for ventilation)	
Synchronous motor		Vector control without speed feedback	
Brake chopper	8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Integrated dynamic brake transistors		Yes	
Min. resistance value (external)	54 Ω	36 Ω	27 Ω
24 VDC supply	8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Input voltage	24 VDC (-15%/+20%)		
Current	Max. 1.1 A		

3-phase ACOPOSinverter P74, 380 to 500 V

8I74T400300.01P-1, 8I74T400400.01P-1, 8I74T400550.01P-1

Available internal power supplies	8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Output voltage 10 VDC		10 VDC (-0%/+10%)	
Output voltage 10 VDC Max. output current at 10 VDC		10 mA	
Interfaces	8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Type		POWERLINK and CANopen	
Digital inputs	8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Quantity		6 ⁶⁾	
Nominal voltage		24 VDC (max. 30 V)	
Input circuit		Source or sink	
Input circuit Current consumption		7 mA	
Digital input 5 Max. input frequency		20 kHz	
Safe input - STO (Safe Torque Off)	8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Quantity		1	
Nominal voltage		24 VDC	
Input impedance		1.5 kΩ	
Input impedance Current consumption		16 mA	
Switching threshold Low High		<2 V >17 V	
Electrical isolation Input - ACOPOSinverter Input - Input		Yes No	
Input circuit		Sink	
Sampling time		4 ms	
Analog inputs	8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Quantity		3	
Input Voltage Current		0 to 10 V, ±10 V 0 to 20 mA (or 4 to 20 mA)	
Resolution		10-bit	
Digital outputs	8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Quantity		1	
Nominal voltage		24 VDC	
Max. voltage		30 VDC	
Output circuit		Source or sink	
Sampling time		2 ms	
Max. current		100 mA	
Relay outputs	8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		R1, with a resistive load (cos phi = 1): 3 A at 250 VAC, R1, with a resistive load (cos phi = 1): 4 A at 30 VDC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 250 VAC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 30 VDC, R2, with a resistive load (cos phi = 1): 5 A at 250 VAC, R2, with a resistive load (cos phi = 1): 5 A at 30 VDC	
Design Relay 1 Relay 2		1 changeover contact 1 normally open contact	
Response time (max.)		2 ms	

8I74T400300.01P-1, 8I74T400400.01P-1, 8I74T400550.01P-1

Analog outputs		8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Quantity			1	
Output			0 to 10 V or 0 to 20 mA	
Resolution			10-bit	
Operating conditions		8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
EN 60529 protection			IP20	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1			2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3			Class 3C3 and 3S3	
Operating position			Vertical installation ±10%	
Environmental conditions		8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Temperature				
Operation			-10 to 50°C without derating 50 to 60°C with derating	
Mechanical characteristics		8I74T400300.01P-1	8I74T400400.01P-1	8I74T400550.01P-1
Dimensions ⁷⁾				
Width	60 mm	60 mm	150 mm	
Height	317 mm	317 mm	308 mm	
Height without shield plate	-	-	232 mm	
Depth	245 mm	245 mm	232 mm	

¹⁾ Peak current when switching on for maximum voltage (240 V +10% or 500 V +10%)

²⁾ Typical value for 4-pole motor and a max. clock frequency of 4 kHz, without mains choke for the max. assumed short circuit current (I_{sc}).

³⁾ Inverter supplied with an integrated Category C2 EMC filter. This filter can be turned off.

⁴⁾ The selection table for the filters specifies the maximum length of the shielded cables between motors and inverters. These maximum cable lengths only serve as a reference point since they depend on the capacity of the motors and the cables being used. The total length should be taken into consideration when motors are connected in parallel. These values apply at a rated clock frequency of 4 kHz.

⁵⁾ These values apply at a rated clock frequency of 4 kHz during continuous operation. The clock frequency can be set from 2 to 16 kHz. Above 4 kHz, reduce the rated drive current. The motor current is not permitted to exceed this value.

⁶⁾ 1 logic input can be programmed as a 20 kbps pulse input. 1 logic input is configurable as an input for a PTC sensor using a switch (SW2). Trigger resistance 3 kΩ, reset value 1.8 kΩ, short circuit protection <50 Ω

⁷⁾ With shield plate

3-phase ACOPOSinverter P74, 380 to 500 V

8I74T400750.01P-1, 8I74T401100.01P-1, 8I74T401500.01P-1



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Motor power	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Listed on nameplate	7.5 kW (10 HP)	11 kW (15 HP)	15 kW (20 HP)
Power mains connector	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Mains input voltage	3x 380 VAC -15% to 500 VAC +10%		
Frequency	50 to 60 Hz ±5%		
Apparent power (at 500 VAC)	16.2 kVA	22.2 kVA	28.8 kVA
Starting current	Max. 27.6 A ¹⁾	Max. 36.7 A ¹⁾	Max. 36.7 A ¹⁾
Mains current			
At 380 VAC	26.5 A ²⁾	36.6 A ²⁾	47.3 A ²⁾
At 500 VAC	18.7 A ²⁾	25.6 A ²⁾	33.3 A ²⁾
Integrated EMC filter		Yes ³⁾	
Line-conducted and radiated emissions	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
With integrated filter			
Motor cable length in accordance with IEC/ EN 61800-3		-	
Cat. C1 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		5 m ⁴⁾	
Cat. C2 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		5 m ⁴⁾	
Cat. C3 environment 2 (industrial mains)			
With add-on filter	8I0FT047.200-1	8I0FT049.200-1	8I0FT049.200-1
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3		20 m ⁴⁾	
Cat. C1 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		50 m ⁴⁾	
Cat. C2 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		50 m ⁴⁾	
Cat. C3 environment 2 (industrial mains)			
Motor connection	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Nominal output current	17 A ⁵⁾	27.7 A ⁵⁾	33 A ⁵⁾
Max. transient current for 60 s	25.5 A	41.6 A	49.5 A
Max. transient current for 2 s	28 A	45.7 A	54.5 A
Output frequency range	0.1 to 599 Hz		
Nominal clock frequency	4 kHz		
Clock frequency			
Min.	2 kHz		
Max.	16 kHz		
Motor closed loop control profiles			
Induction motor		Flux vector control without an encoder Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) Pump/Fan profile (quadratic curve Kn ²) Energy saving profile (especially for ventilation)	
Synchronous motor		Vector control without speed feedback	
Brake chopper	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Integrated dynamic brake transistors		Yes	
Min. resistance value (external)	27 Ω	16 Ω	16 Ω
24 VDC supply	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Input voltage	24 VDC (-15%/+20%)		
Current	Max. 1.1 A		

8I74T400750.01P-1, 8I74T401100.01P-1, 8I74T401500.01P-1

Available internal power supplies	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Output voltage 10 VDC		10 VDC (-0%/+10%)	
Output voltage 10 VDC			
Max. output current at 10 VDC		10 mA	
Interfaces	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Type		POWERLINK and CANopen	
Digital inputs	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Quantity		6 ⁶⁾	
Nominal voltage		24 VDC (max. 30 V)	
Input circuit		Source or sink	
Input circuit			
Current consumption		7 mA	
Digital input 5			
Max. input frequency		20 kHz	
Safe input - STO (Safe Torque Off)	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Quantity		1	
Nominal voltage		24 VDC	
Input impedance		1.5 kΩ	
Input impedance			
Current consumption		16 mA	
Switching threshold			
Low		<2 V	
High		>17 V	
Electrical isolation			
Input - ACOPOSinverter		Yes	
Input - Input		No	
Input circuit		Sink	
Sampling time		4 ms	
Analog inputs	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Quantity		3	
Input			
Voltage		0 to 10 V, ±10 V	
Current		0 to 20 mA (or 4 to 20 mA)	
Resolution		10-bit	
Digital outputs	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Quantity		1	
Nominal voltage		24 VDC	
Max. voltage		30 VDC	
Output circuit		Source or sink	
Sampling time		2 ms	
Max. current		100 mA	
Relay outputs	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		R1, with a resistive load (cos phi = 1): 3 A at 250 VAC, R1, with a resistive load (cos phi = 1): 4 A at 30 VDC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 250 VAC, R1, R2, with an inductive load (cos = 0.4 and L/R = 7 ms): 2 A at 30 VDC, R2, with a resistive load (cos phi = 1): 5 A at 250 VAC, R2, with a resistive load (cos phi = 1): 5 A at 30 VDC	
Design			
Relay 1		1 changeover contact	
Relay 2		1 normally open contact	
Response time (max.)		2 ms	

3-phase ACOPOSinverter P74, 380 to 500 V

8I74T400750.01P-1, 8I74T401100.01P-1, 8I74T401500.01P-1

Analog outputs	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Quantity		1	
Output		0 to 10 V or 0 to 20 mA	
Resolution		10-bit	
Operating conditions	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
EN 60529 protection		IP20	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1		2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3		Class 3C3 and 3S3	
Operating position		Vertical installation $\pm 10\%$	
Environmental conditions	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Temperature			
Operation		-10 to 50°C without derating 50 to 60°C with derating	
Mechanical characteristics	8I74T400750.01P-1	8I74T401100.01P-1	8I74T401500.01P-1
Dimensions ⁷⁾			
Width	150 mm	180 mm	180 mm
Height	308 mm	404 mm	404 mm
Height without shield plate	232 mm	330 mm	330 mm
Depth		232 mm	

¹⁾ Peak current when switching on for maximum voltage (240 V +10% or 500 V +10%)

²⁾ Typical value for 4-pole motor and a max. clock frequency of 4 kHz, without mains choke for the max. assumed short circuit current (I_{sc}).

³⁾ Inverter supplied with an integrated Category C2 EMC filter. This filter can be turned off.

⁴⁾ The selection table for the filters specifies the maximum length of the shielded cables between motors and inverters. These maximum cable lengths only serve as a reference point since they depend on the capacity of the motors and the cables being used. The total length should be taken into consideration when motors are connected in parallel. These values apply at a rated clock frequency of 4 kHz.

⁵⁾ These values apply at a rated clock frequency of 4 kHz during continuous operation. The clock frequency can be set from 2 to 16 kHz. Above 4 kHz, reduce the rated drive current. The motor current is not permitted to exceed this value.

⁶⁾ 1 logic input can be programmed as a 20 kbps pulse input. 1 logic input is configurable as an input for a PTC sensor using a switch (SW2). Trigger resistance 3 k Ω , reset value 1.8 k Ω , short circuit protection <50 Ω

⁷⁾ With shield plate



3-phase ACOPOSinverter P84, 200 to 240 V

8184T200037.01P-1, 8184T200075.01P-1, 8184T200150.01P-1



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Motor power	8184T200037.01P-1	8184T200075.01P-1	8184T200150.01P-1
Listed on nameplate, 1-phase	-	0.37 kW 0.5 PS	0.75 kW 1 PS
Listed on nameplate, 3-phase	0.37 kW 0.5 PS	0.75 kW 1 PS	1.5 kW 2 PS
Power mains connector	8184T200037.01P-1	8184T200075.01P-1	8184T200150.01P-1
Mains input voltage, 1-phase	-	1x 200 VAC -15% to 240 VAC +10%	1x 200 VAC -15% to 240 VAC +10%
Mains input voltage, 3-phase		3x 200 VAC -15% to 240 VAC +10%	
Frequency		50 to 60 Hz ±5%	
Mains current			
At 200 VAC	3.5 A	-	-
At 240 VAC	3.1 A	-	-
Integrated EMC filter		Yes ¹⁾	
Line-conducted and radiated emissions	8184T200037.01P-1	8184T200075.01P-1	8184T200150.01P-1
With integrated filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		-	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		≤10 m / ≤5 m ²⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤10 m / ≤5 m ²⁾	
With add-on filter		810FT012.300-1	
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		≤50 m / ≤20 m ³⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		≤100 m / ≤50 m ⁴⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤100 m / ≤50 m ⁴⁾	
Motor connection	8184T200037.01P-1	8184T200075.01P-1	8184T200150.01P-1
Max. continuous output current (I _n)			
At 230 VAC, 1-phase	-	3 A ⁵⁾	4.8 A ⁵⁾
At 230 VAC, 3-phase	3 A ⁵⁾	4.8 A ⁵⁾	8 A ⁵⁾
Max. transient current for 60 s, 1-phase	-	4.5 A	7.2 A
Max. transient current for 60 s, 3-phase	4.5 A	7.2 A	12 A
Max. transient current for 2 s, 1-phase	-	4.9 A	7.9 A
Max. transient current for 2 s, 3-phase	4.9 A	7.9 A	13.2 A
Output frequency range		0.5 to 599 Hz	
Nominal clock frequency		4 kHz	
Motor closed loop control profiles		Flux vector control (FVC) with encoder (voltage vector) (current vector) Flux vector control (SFVC) without encoder (voltage or current vector) Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) ENA energy adjustment system for asymmetrical loads	
Induction motor			
Brake chopper	8184T200037.01P-1	8184T200075.01P-1	8184T200150.01P-1
Integrated dynamic brake transistors		Yes	
Min. resistance value (external)	44 Ω ⁶⁾	44 Ω ⁶⁾	33 Ω ⁶⁾
24 VDC supply	8184T200037.01P-1	8184T200075.01P-1	8184T200150.01P-1
Input voltage		24 VDC (min. 19 V, max. 30 V)	
Power consumption		30 W	

8I84T200037.01P-1, 8I84T200075.01P-1, 8I84T200150.01P-1

Safe input - Power removal	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Quantity		1	
Nominal voltage		24 VDC	
Input circuit		Sink	
Interfaces	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Type		POWERLINK and CANopen	
Digital inputs	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Quantity		6 ⁷⁾	
Nominal voltage		24 VDC	
Input circuit		Source or sink	
Analog inputs	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Quantity		2	
Input			
Voltage		±10 V	
Voltage/Current		0 to 10 V or 0 to 20 mA	
Resolution		±11 bits	
Relay outputs	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		Max. 2 A for 250 VAC or 30 VDC with resistive load	
Design			
Relay 1		1 N.O. contact and 1 N.C. contact with a common point	
Relay 2		1 N.O. contact	
Analog outputs	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Quantity		1	
Output		0 to 10 V or 0 to 20 mA ⁸⁾	
Resolution		10-bit	
Operating conditions	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
EN 60529 protection		Upper part: IP21 and IP41 Lower part: IP54 (heat sink)	
Ambient temperature		-10 to 50°C	
Max. ambient temperature		Up to 60°C	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1		2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3		Class 3C1 and 3S2	
Operating position		Vertical installation ±10%	
Mechanical characteristics	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Dimensions			
Width		130 mm	
Height		230 mm	
Depth		175 mm	

¹⁾ Shield plate included in delivery

²⁾ For shielded motor cables
 ≤10 m → At a clock frequency of 4 kHz
 ≤5 m → At a clock frequency of 4.1 to 16 kHz

³⁾ For shielded motor cables
 ≤50 m → At a clock frequency of 4 kHz
 ≤20 m → At a clock frequency of 4.1 to 16 kHz

⁴⁾ For shielded motor cables
 ≤100 m → At a clock frequency of 4 kHz
 ≤50 m → At a clock frequency of 4.1 to 16 kHz

⁵⁾ These values apply at the rated clock frequency.

⁶⁾ The min. resistance value is specified at a temperature of 20°C. In environments with temperatures over 20°C, the min. resistance listed in the table must be used.

⁷⁾ 1 logic input, configurable as a logic input or PTC sensor input using a switch. Input for max. 6 PTC sensors in series: Rated value <1.5 kΩ, 3 kΩ trigger resistance, 1.8 kΩ reset value, short circuit protection <50 Ω

⁸⁾ The analog output is configurable as a logic output.

3-phase ACOPOSinverter P84, 200 to 240 V

8184T200220.01P-1, 8184T200300.01P-1, 8184T200400.01P-1



ETHERNET 
POWERLINK

CANopen

Motor power	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
Listed on nameplate, 1-phase	1.5 kW 2 PS	2.2 kW 3 PS	3 kW -
Listed on nameplate, 3-phase	2.2 kW 3 PS	3 kW -	4 kW 5 PS
Power mains connector	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
Mains input voltage, 1-phase	1x 200 VAC -15% to 240 VAC +10%	1x 200 VAC -15% to 240 VAC +10%	1x 200 VAC -15% to 240 VAC +10% ¹⁾
Mains input voltage, 3-phase	3x 200 VAC -15% to 240 VAC +10%		
Frequency	50 to 60 Hz ±5%		
Integrated EMC filter	Yes ²⁾		
Line-conducted and radiated emissions	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
With integrated filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		-	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)	≤10 m / ≤5 m ³⁾	-	-
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤10 m / ≤5 m ³⁾	
With add-on filter		810FT026.300-1	
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		≤50 m / ≤20 m ⁴⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		≤100 m / ≤50 m ⁵⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤100 m / ≤50 m ⁵⁾	
Motor connection	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
Max. continuous output current (I _n)			
At 230 VAC, 1-phase	8 A ⁶⁾	11 A ⁶⁾	13.7 A ⁶⁾
At 230 VAC, 3-phase	11 A ⁶⁾	13.7 A ⁶⁾	17.5 A ⁶⁾
Max. transient current for 60 s, 1-phase	12 A	16.5 A	20.6 A
Max. transient current for 60 s, 3-phase	16.5 A	20.6 A	26.3 A
Max. transient current for 2 s, 1-phase	13.2 A	18.1 A	22.6 A
Max. transient current for 2 s, 3-phase	18.1 A	22.6 A	28.8 A
Output frequency range	0.5 to 599 Hz		
Nominal clock frequency	4 kHz		
Motor closed loop control profiles	Induction motor Flux vector control (FVC) with encoder (voltage vector) (current vector) Flux vector control (SFVC) without encoder (voltage or current vector) Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) ENA energy adjustment system for asymmetrical loads		
Brake chopper	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
Integrated dynamic brake transistors		Yes	
Min. resistance value (external)	22 Ω ⁷⁾	22 Ω ⁷⁾	16 Ω ⁷⁾
24 VDC supply	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)		
Power consumption	30 W		

8I84T200220.01P-1, 8I84T200300.01P-1, 8I84T200400.01P-1

Safe input - Power removal	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Quantity		1	
Nominal voltage		24 VDC	
Input circuit		Sink	
Interfaces	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Type		POWERLINK and CANopen	
Digital inputs	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Quantity		6 ⁸⁾	
Nominal voltage		24 VDC	
Input circuit		Source or sink	
Analog inputs	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Quantity		2	
Input			
Voltage		±10 V	
Voltage/Current		0 to 10 V or 0 to 20 mA	
Resolution		±11 bits	
Relay outputs	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		Max. 2 A for 250 VAC or 30 VDC with resistive load	
Design			
Relay 1		1 N.O. contact and 1 N.C. contact with a common point	
Relay 2		1 N.O. contact	
Analog outputs	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Quantity		1	
Output		0 to 10 V or 0 to 20 mA ⁹⁾	
Resolution		10-bit	
Operating conditions	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
EN 60529 protection		Upper part: IP21 and IP41 Lower part: IP54 (heat sink)	
Ambient temperature		-10 to 50°C	
Max. ambient temperature		Up to 60°C	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1		2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3		Class 3C1 and 3S2	
Operating position		Vertical installation ±10%	
Mechanical characteristics	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Dimensions			
Width		155 mm	
Height		260 mm	
Depth		187 mm	

¹⁾ A mains choke must be used.

²⁾ Shield plate included in delivery

³⁾ For shielded motor cables
 ≤10 m → At a clock frequency of 4 kHz
 ≤5 m → At a clock frequency of 4.1 to 16 kHz

⁴⁾ For shielded motor cables
 ≤50 m → At a clock frequency of 4 kHz
 ≤20 m → At a clock frequency of 4.1 to 16 kHz

⁵⁾ For shielded motor cables
 ≤100 m → At a clock frequency of 4 kHz
 ≤50 m → At a clock frequency of 4.1 to 16 kHz

⁶⁾ These values apply at the rated clock frequency.

⁷⁾ The min. resistance value is specified at a temperature of 20°C. In environments with temperatures over 20°C, the min. resistance listed in the table must be used.

⁸⁾ 1 logic input, configurable as a logic input or PTC sensor input using a switch. Input for max. 6 PTC sensors in series: Rated value <1.5 kΩ, 3 kΩ trigger resistance, 1.8 kΩ reset value, short circuit protection <50 Ω

⁹⁾ The analog output is configurable as a logic output.

3-phase ACOPOSinverter P84, 200 to 240 V

8184T200550.01P-1, 8184T200750.01P-1, 8184T201100.01P-1



ETHERNET
POWERLINK

CANopen

Motor power	8184T200550.01P-1	8184T200750.01P-1	8184T201100.01P-1
Listed on nameplate, 1-phase	4 kW 5 PS	5.5 kW 7.5 PS	-
Listed on nameplate, 3-phase	5.5 kW 7.5 PS	7.5 kW 10 PS	11 kW 15 PS
Power mains connector	8184T200550.01P-1	8184T200750.01P-1	8184T201100.01P-1
Mains input voltage, 1-phase	1x 200 VAC -15% to 240 VAC +10% ¹⁾	1x 200 VAC -15% to 240 VAC +10% ¹⁾	-
Mains input voltage, 3-phase	3x 200 VAC -15% to 240 VAC +10%		
Frequency	50 to 60 Hz ±5%		
At 200 VAC	-	-	53.3 A
At 240 VAC	-	-	45.8 A
Integrated EMC filter	Yes ²⁾	Yes ²⁾	No ²⁾
Line-conducted and radiated emissions	8184T200550.01P-1	8184T200750.01P-1	8184T201100.01P-1
With integrated filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		-	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		-	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)	≤10 m / ≤5 m ³⁾	≤10 m / ≤5 m ³⁾	-
With add-on filter	810FT026.300-1	810FT046.300-1	810FT072.300-1
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)	≤50 m / ≤20 m ⁴⁾	≤50 m / ≤20 m ⁴⁾	≤50 m / ≤25 m
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)	≤100 m / ≤50 m ⁵⁾	≤100 m / ≤50 m ⁵⁾	≤100 m / ≤50 m
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)	≤100 m / ≤50 m ⁵⁾	≤100 m / ≤50 m ⁵⁾	≤100 m / ≤50 m
Motor connection	8184T200550.01P-1	8184T200750.01P-1	8184T201100.01P-1
Max. continuous output current (I _n)			
At 230 VAC, 1-phase	17.5 A ⁶⁾	27.5 A ⁶⁾	-
At 230 VAC, 3-phase	27.5 A ⁶⁾	33 A ⁶⁾	54 A
Max. transient current for 60 s, 1-phase	26.3 A	41.3 A	-
Max. transient current for 60 s, 3-phase	41.3 A	49.5 A	81 A
Max. transient current for 2 s, 1-phase	28.8 A	45.3 A	-
Max. transient current for 2 s, 3-phase	45.3 A	54.5 A	89.1 A
Output frequency range	0.5 to 599 Hz		
Nominal clock frequency	4 kHz		
Motor closed loop control profiles			
Induction motor	Flux vector control (FVC) with encoder (voltage vector) (current vector) Flux vector control (SFVC) without encoder (voltage or current vector) Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) ENA energy adjustment system for asymmetrical loads		
Brake chopper	8184T200550.01P-1	8184T200750.01P-1	8184T201100.01P-1
Integrated dynamic brake transistors		Yes	
Min. resistance value (external)	11 Ω ⁷⁾	8 Ω ⁷⁾	3 Ω ⁷⁾
24 VDC supply	8184T200550.01P-1	8184T200750.01P-1	8184T201100.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)		
Power consumption	30 W		

8I84T200550.01P-1, 8I84T200750.01P-1, 8I84T201100.01P-1

Safe input - Power removal	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Quantity		1	
Nominal voltage		24 VDC	
Input circuit		Sink	
Interfaces	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Type		POWERLINK and CANopen	
Digital inputs	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Quantity		6 ⁸⁾	
Nominal voltage		24 VDC	
Input circuit		Source or sink	
Analog inputs	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Quantity		2	
Input			
Voltage		±10 V	
Voltage/Current		0 to 10 V or 0 to 20 mA	
Resolution		±11 bits	
Relay outputs	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		Max. 2 A at 250 VAC or 30 VDC with resistive load	
Design			
Relay 1		1 N.O. contact and 1 N.C. contact with a common point	
Relay 2		1 N.O. contact	
Analog outputs	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Quantity		1	
Output		0 to 10 V or 0 to 20 mA ⁹⁾	
Resolution		10-bit	
Operating conditions	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
EN 60529 protection		Upper part: IP21 and IP41 Lower part: IP54 (heat sink)	
Ambient temperature		-10 to 50°C	
Max. ambient temperature		Up to 60°C	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1		2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3		Class 3C1 and 3S2	
Operating position		Vertical installation ±10%	
Mechanical characteristics	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Dimensions			
Width	175 mm	210 mm	230 mm
Height	295 mm	295 mm	400 mm
Depth	187 mm	213 mm	213 mm

¹⁾ A mains choke must be used.

²⁾ Shield plate included in delivery

³⁾ For shielded motor cables
 ≤10 m → At a clock frequency of 4 kHz
 ≤5 m → At a clock frequency of 4.1 to 16 kHz

⁴⁾ For shielded motor cables
 ≤50 m → At a clock frequency of 4 kHz
 ≤20 m → At a clock frequency of 4.1 to 16 kHz

⁵⁾ For shielded motor cables
 ≤100 m → At a clock frequency of 4 kHz
 ≤50 m → At a clock frequency of 4.1 to 16 kHz

⁶⁾ These values apply at the rated clock frequency.

⁷⁾ The min. resistance value is specified at a temperature of 20°C. In environments with temperatures over 20°C, the min. resistance listed in the table must be used.

⁸⁾ 1 logic input, configurable as a logic input or PTC sensor input using a switch. Input for max. 6 PTC sensors in series: Rated value <1.5 kΩ, 3 kΩ trigger resistance, 1.8 kΩ reset value, short circuit protection <50 Ω

⁹⁾ The analog output is configurable as a logic output.

3-phase ACOPOSinverter P84, 200 to 240 V

8184T201500.01P-1, 8184T201850.01P-1, 8184T202200.01P-1



ETHERNET 
POWERLINK

CANopen

Motor power	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Listed on nameplate	15 kW 20 PS	18.5 kW 25 PS	22 kW 30 PS
Power mains connector	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Mains input voltage	3x 200 VAC -15% to 240 VAC +10%		
Frequency	50 to 60 Hz ±5%		
Mains current			
At 200 VAC	71.7 A	77 A	88 A
At 240 VAC	61.6 A	69 A	80 A
Integrated EMC filter	No ¹⁾		
Line-conducted and radiated emissions	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
With add-on filter	810FT072.300-1	810FT090.300-1	810FT090.300-1
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)	≤50 m / ≤25 m ²⁾	≤50 m / ≤25 m ³⁾	≤50 m / ≤25 m ³⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)	≤100 m / ≤50 m ⁴⁾	≤100 m / ≤50 m ⁵⁾	≤100 m / ≤50 m ⁵⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)	≤100 m / ≤50 m ⁴⁾	≤100 m / ≤50 m ⁵⁾	≤100 m / ≤50 m ⁵⁾
Motor connection	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Max. continuous output current (I _n)			
At 230 VAC	66 A ⁶⁾	75 A ⁶⁾	88 A ⁶⁾
Max. transient current for 60 s	99 A	112 A	132 A
Max. transient current for 2 s	109 A	124 A	145 A
Output frequency range	0.5 to 599 Hz		
Nominal clock frequency	4 kHz	2.5 kHz	2.5 kHz
Motor closed loop control profiles	Induction motor Flux vector control (FVC) with encoder (voltage vector) (current vector) Flux vector control (SFVC) without encoder (voltage or current vector) Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) ENA energy adjustment system for asymmetrical loads		
Brake chopper	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Integrated dynamic brake transistors	Yes		
Min. resistance value (external)	3 Ω ⁷⁾	4 Ω ⁷⁾	3.3 Ω ⁷⁾
24 VDC supply	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)		
Power consumption	30 W		
Safe input - Power removal	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Quantity	1		
Nominal voltage	24 VDC		
Input circuit	Sink		
Interfaces	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Type	POWERLINK and CANopen		
Digital inputs	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Quantity	6 ⁸⁾		
Nominal voltage	24 VDC		
Input circuit	Source or sink		

8I84T201500.01P-1, 8I84T201850.01P-1, 8I84T202200.01P-1

Analog inputs	8I84T201500.01P-1	8I84T201850.01P-1	8I84T202200.01P-1
Quantity		2	
Input			
Voltage		±10 V	
Voltage/Current		0 to 10 V or 0 to 20 mA	
Resolution		±11 bits	
Relay outputs	8I84T201500.01P-1	8I84T201850.01P-1	8I84T202200.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		Max. 2 A at 250 VAC or 30 VDC with resistive load	
Design			
Relay 1		1 N.O. contact and 1 N.C. contact with a common point	
Relay 2		1 N.O. contact	
Analog outputs	8I84T201500.01P-1	8I84T201850.01P-1	8I84T202200.01P-1
Quantity		1	
Output		0 to 10 V or 0 to 20 mA ⁹⁾	
Resolution		10-bit	
Operating conditions	8I84T201500.01P-1	8I84T201850.01P-1	8I84T202200.01P-1
EN 60529 protection		Upper part: IP21 and IP41 Lower part: IP54 (heat sink)	
Ambient temperature		-10 to 50°C	
Max. ambient temperature		Up to 60°C	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1		2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3		Class 3C1 and 3S2	
Operating position		Vertical installation ±10%	
Mechanical characteristics	8I84T201500.01P-1	8I84T201850.01P-1	8I84T202200.01P-1
Dimensions			
Width	230 mm	240 mm	240 mm
Height	400 mm	420 mm	420 mm
Depth	213 mm	236 mm	236 mm

¹⁾ Shield plate included in delivery

²⁾ For shielded motor cables
 ≤50 m → At a clock frequency of 3.5 to 4 kHz
 ≤25 m → At a clock frequency of 4.1 to 12 kHz

³⁾ For shielded motor cables
 ≤50 m → At a clock frequency of 2 to 2.5 kHz
 ≤25 m → At a clock frequency of 2.6 to 12 kHz

⁴⁾ For shielded motor cables
 ≤100 m → At a clock frequency of 3.5 to 4 kHz
 ≤50 m → At a clock frequency of 4.1 to 12 kHz

⁵⁾ For shielded motor cables
 ≤100 m → At a clock frequency of 2 to 2.5 kHz
 ≤50 m → At a clock frequency of 2.6 to 12 kHz

⁶⁾ These values apply at the rated clock frequency.

⁷⁾ The min. resistance value is specified at a temperature of 20°C. In environments with temperatures over 20°C, the min. resistance listed in the table must be used.

⁸⁾ 1 logic input, configurable as a logic input or PTC sensor input using a switch. Input for max. 6 PTC sensors in series: Rated value <1.5 kΩ, 3 kΩ trigger resistance, 1.8 kΩ reset value, short circuit protection <50 Ω

⁹⁾ The analog output is configurable as a logic output.

3-phase ACOPOSinverter P84, 200 to 240 V

8184T203000.01P-1, 8184T203700.01P-1, 8184T204500.01P-1



ETHERNET
POWERLINK

CANopen

Motor power	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Listed on nameplate	30 kW 40 PS	37 kW 50 PS	45 kW 60 PS
Power mains connector	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Mains input voltage	3x 200 VAC -15% to 240 VAC +10%		
Frequency	50 to 60 Hz ±5%		
Mains current			
At 200 VAC	124 A	141 A	167 A
At 240 VAC	110 A	127 A	147 A
Integrated EMC filter	No ¹⁾		
Line-conducted and radiated emissions	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
With add-on filter	810FT180.300-1		
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		≤50 m / ≤25 m ²⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		≤100 m / ≤50 m ³⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤100 m / ≤50 m ³⁾	
Motor connection	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Max. continuous output current (I _n)			
At 230 VAC	120 A ⁴⁾	144 A ⁴⁾	176 A ⁴⁾
Max. transient current for 60 s	180 A	216 A	264 A
Max. transient current for 2 s	198 A	238 A	290 A
Output frequency range	0.5 to 599 Hz	0.5 to 599 Hz	0.5 to 500 Hz
Nominal clock frequency	2.5 kHz		
Motor closed loop control profiles	Induction motor Flux vector control (FVC) with encoder (voltage vector) (current vector) Flux vector control (SFVC) without encoder (voltage or current vector) Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) ENA energy adjustment system for asymmetrical loads		
Brake chopper	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Integrated dynamic brake transistors	Yes		
Min. resistance value (external)	3.3 Ω ⁵⁾	1.7 Ω ⁵⁾	1.7 Ω ⁵⁾
24 VDC supply	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)		
Power consumption	30 W		
Safe input - Power removal	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Quantity	1		
Nominal voltage	24 VDC		
Input circuit	Sink		
Interfaces	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Type	POWERLINK and CANopen		
Digital inputs	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Quantity	6 ⁶⁾		
Nominal voltage	24 VDC		
Input circuit	Source or sink		

8I84T203000.01P-1, 8I84T203700.01P-1, 8I84T204500.01P-1

Analog inputs	8I84T203000.01P-1	8I84T203700.01P-1	8I84T204500.01P-1
Quantity		2	
Input			
Voltage		±10 V	
Voltage/Current		0 to 10 V or 0 to 20 mA	
Resolution		±11 bits	
Relay outputs	8I84T203000.01P-1	8I84T203700.01P-1	8I84T204500.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		Max. 2 A at 250 VAC or 30 VDC with resistive load	
Design			
Relay 1		1 N.O. contact and 1 N.C. contact with a common point	
Relay 2		1 N.O. contact	
Analog outputs	8I84T203000.01P-1	8I84T203700.01P-1	8I84T204500.01P-1
Quantity		1	
Output		0 to 10 V or 0 to 20 mA ⁷⁾	
Resolution		10-bit	
Operating conditions	8I84T203000.01P-1	8I84T203700.01P-1	8I84T204500.01P-1
EN 60529 protection		Upper part: IP21 and IP41 Lower part: IP54 (heat sink)	
Ambient temperature		-10 to 50°C	
Max. ambient temperature		Up to 60°C	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1		2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3		Class 3C1 and 3S2	
Operating position		Vertical installation ±10%	
Mechanical characteristics	8I84T203000.01P-1	8I84T203700.01P-1	8I84T204500.01P-1
Dimensions			
Width		320 mm	
Height		550 mm	
Depth		266 mm	

¹⁾ Shield plate included in delivery

²⁾ For shielded motor cables
 ≤50 m → At a clock frequency of 2 to 2.5 kHz
 ≤25 m → At a clock frequency of 2.6 to 12 kHz

³⁾ For shielded motor cables
 ≤100 m → At a clock frequency of 2 to 2.5 kHz
 ≤50 m → At a clock frequency of 2.6 to 12 kHz

⁴⁾ These values apply at the rated clock frequency.

⁵⁾ The min. resistance value is specified at a temperature of 20°C. In environments with temperatures over 20°C, the min. resistance listed in the table must be used.

⁶⁾ 1 logic input, configurable as a logic input or PTC sensor input using a switch. Input for max. 6 PTC sensors in series: Rated value <1.5 kΩ, 3 kΩ trigger resistance, 1.8 kΩ reset value, short circuit protection <50 Ω

⁷⁾ The analog output is configurable as a logic output.

3-phase ACOPOSinverter P84, 380 to 480 V

8184T400075.01P-1, 8184T400150.01P-1, 8184T400220.01P-1



ETHERNET 
POWERLINK

CANopen

Motor power	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
Listed on nameplate	0.75 kW 1 PS	1.5 kW 2 PS	2.2 kW 3 PS
Power mains connector	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
Mains input voltage	3x 380 VAC -15% to 480 VAC +10%		
Frequency	50 to 60 Hz ±5%		
Apparent power (at 380 VAC)	2.4 kVA	3.8 kVA	5.4 kVA
Mains current			
At 380 VAC	3.7 A	5.8 A	8.2 A
At 480 VAC	3 A	5.3 A	7.1 A
Integrated EMC filter	Yes ¹⁾		
Line-conducted and radiated emissions	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
With integrated filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		-	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		≤10 m / ≤5 m ²⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤10 m / ≤5 m ²⁾	
With add-on filter	810FT012.300-1		
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		≤50 m / ≤20 m ³⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		≤100 m / ≤50 m ⁴⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤100 m / ≤50 m ⁴⁾	
Motor connection	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
Max. continuous output current (I _n)			
At 380 VAC	2.3 A ⁵⁾	4.1 A ⁵⁾	5.8 A ⁵⁾
At 460 VAC	2.1 A ⁵⁾	3.4 A ⁵⁾	4.8 A ⁵⁾
Max. transient current for 60 s	3.5 A	6.2 A	8.7 A
Max. transient current for 2 s	3.8 A	6.8 A	9.6 A
Output frequency range	0.5 to 599 Hz		
Nominal clock frequency	4 kHz		
Motor closed loop control profiles	Induction motor Flux vector control (FVC) with encoder (voltage vector) (current vector) Flux vector control (SFVC) without encoder (voltage or current vector) Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) ENA energy adjustment system for asymmetrical loads		
Brake chopper	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
Integrated dynamic brake transistors	Yes		
Min. resistance value (external)	56 Ω ⁶⁾		
24 VDC supply	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)		
Power consumption	30 W		
Safe input - Power removal	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
Quantity	1		
Nominal voltage	24 VDC		
Input circuit	Sink		

8I84T400075.01P-1, 8I84T400150.01P-1, 8I84T400220.01P-1

Interfaces	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
Type		POWERLINK and CANopen	
Digital inputs	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
Quantity		6 ⁷⁾	
Nominal voltage		24 VDC	
Input circuit		Source or sink	
Analog inputs	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
Quantity		2	
Input			
Voltage		±10 V	
Voltage/Current		0 to 10 V or 0 to 20 mA	
Resolution		±11 bits	
Relay outputs	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		Max. 2 A at 250 VAC or 30 VDC with resistive load	
Design			
Relay 1		1 N.O. contact and 1 N.C. contact with a common point	
Relay 2		1 N.O. contact	
Analog outputs	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
Quantity		1	
Output		0 to 10 V or 0 to 20 mA ⁸⁾	
Resolution		10-bit	
Operating conditions	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
EN 60529 protection		Upper part: IP21 and IP41 Lower part: IP54 (heat sink)	
Ambient temperature		-10 to 50°C	
Max. ambient temperature		Up to 60°C	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1		2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3		Class 3C1 and 3S2	
Operating position		Vertical installation ±10%	
Mechanical characteristics	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
Dimensions			
Width		130 mm	
Height		230 mm	
Depth		175 mm	

¹⁾ Shield plate included in delivery

²⁾ For shielded motor cables
≤10 m → At a clock frequency of 4 kHz
≤5 m → At a clock frequency of 4.1 to 16 kHz

³⁾ For shielded motor cables
≤50 m → At a clock frequency of 4 kHz
≤20 m → At a clock frequency of 4.1 to 16 kHz

⁴⁾ For shielded motor cables
≤100 m → At a clock frequency of 4 kHz
≤50 m → At a clock frequency of 4.1 to 16 kHz

⁵⁾ These values apply at the rated clock frequency.

⁶⁾ The min. resistance value is specified at a temperature of 20°C. In environments with temperatures over 20°C, the min. resistance listed in the table must be used.

⁷⁾ 1 logic input, configurable as a logic input or PTC sensor input using a switch. Input for max. 6 PTC sensors in series: Rated value <1.5 kΩ, 3 kΩ trigger resistance, 1.8 kΩ reset value, short circuit protection <50 Ω

⁸⁾ The analog output is configurable as a logic output.

3-phase ACOPOSinverter P84, 380 to 480 V

8184T400300.01P-1, 8184T400400.01P-1, 8184T400550.01P-1



ETHERNET 
POWERLINK

CANopen

Motor power	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
Listed on nameplate	3 kW -	4 kW 5 PS	5.5 kW 7.5 PS
Power mains connector	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
Mains input voltage	3x 380 VAC -15% to 480 VAC +10%		
Frequency	50 to 60 Hz ±5%		
Apparent power (at 380 VAC)	7 kVA	9.3 kVA	13.4 kVA
Mains current			
At 380 VAC	10.7 A	14.1 A	20.3 A
At 480 VAC	9 A	11.5 A	17 A
Integrated EMC filter	Yes ¹⁾		
Line-conducted and radiated emissions	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
With integrated filter			
Motor cable length in accordance with IEC/ EN 61800-3		-	
Cat. C1 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		≤10 m / ≤5 m ²⁾	
Cat. C2 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		≤10 m / ≤5 m ²⁾	
Cat. C3 environment 2 (industrial mains)			
With add-on filter	810FT026.300-1	810FT026.300-1	810FT035.300-1
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3		≤50 m / ≤20 m ³⁾	
Cat. C1 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		≤100 m / ≤50 m ⁴⁾	
Cat. C2 environment 1 (public mains)			
Motor cable length in accordance with IEC/ EN 61800-3		≤100 m / ≤50 m ⁴⁾	
Cat. C3 environment 2 (industrial mains)			
Motor connection	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
Max. continuous output current (I _n)			
At 380 VAC	7.8 A ⁵⁾	10.5 A ⁵⁾	14.3 A ⁵⁾
At 460 VAC	6.2 A ⁵⁾	7.6 A ⁵⁾	11 A ⁵⁾
Max. transient current for 60 s	11.7 A	15.8 A	21.5 A
Max. transient current for 2 s	12.9 A	17.3 A	23.6 A
Output frequency range	0.5 to 599 Hz		
Nominal clock frequency	4 kHz		
Motor closed loop control profiles			
Induction motor	Flux vector control (FVC) with encoder (voltage vector) (current vector) Flux vector control (SFVC) without encoder (voltage or current vector) Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) ENA energy adjustment system for asymmetrical loads		
Brake chopper	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
Integrated dynamic brake transistors	Yes		
Min. resistance value (external)	34 Ω ⁶⁾	34 Ω ⁶⁾	23 Ω ⁶⁾
24 VDC supply	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)		
Power consumption	30 W		
Safe input - Power removal	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
Quantity	1		
Nominal voltage	24 VDC		
Input circuit	Sink		

8184T400300.01P-1, 8184T400400.01P-1, 8184T400550.01P-1

Interfaces	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
Type		POWERLINK and CANopen	
Digital inputs	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
Quantity		6 ⁷⁾	
Nominal voltage		24 VDC	
Input circuit		Source or sink	
Analog inputs	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
Quantity		2	
Input			
Voltage		±10 V	
Voltage/Current		0 to 10 V or 0 to 20 mA	
Resolution		±11 bits	
Relay outputs	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		Max. 2 A at 250 VAC or 30 VDC with resistive load	
Design			
Relay 1		1 N.O. contact and 1 N.C. contact with a common point	
Relay 2		1 N.O. contact	
Analog outputs	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
Quantity		1	
Output		0 to 10 V or 0 to 20 mA ⁸⁾	
Resolution		10-bit	
Operating conditions	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
EN 60529 protection		Upper part: IP21 and IP41 Lower part: IP54 (heat sink)	
Ambient temperature		-10 to 50°C	
Max. ambient temperature		Up to 60°C	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1		2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3		Class 3C1 and 3S2	
Operating position		Vertical installation ±10%	
Mechanical characteristics	8184T400300.01P-1	8184T400400.01P-1	8184T400550.01P-1
Dimensions			
Width	155 mm	155 mm	175 mm
Height	260 mm	260 mm	295 mm
Depth		187 mm	

¹⁾ Shield plate included in delivery

²⁾ For shielded motor cables
≤10 m → At a clock frequency of 4 kHz
≤5 m → At a clock frequency of 4.1 to 16 kHz

³⁾ For shielded motor cables
≤50 m → At a clock frequency of 4 kHz
≤20 m → At a clock frequency of 4.1 to 16 kHz

⁴⁾ For shielded motor cables
≤100 m → At a clock frequency of 4 kHz
≤50 m → At a clock frequency of 4.1 to 16 kHz

⁵⁾ These values apply at the rated clock frequency.

⁶⁾ The min. resistance value is specified at a temperature of 20°C. In environments with temperatures over 20°C, the min. resistance listed in the table must be used.

⁷⁾ 1 logic input, configurable as a logic input or PTC sensor input using a switch. Input for max. 6 PTC sensors in series: Rated value <1.5 kΩ, 3 kΩ trigger resistance, 1.8 kΩ reset value, short circuit protection <50 Ω

⁸⁾ The analog output is configurable as a logic output.

3-phase ACOPOSinverter P84, 380 to 480 V

8I84T400750.01P-1, 8I84T401100.01P-1, 8I84T401500.01P-1



ETHERNET 
POWERLINK

CANopen

Motor power	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Listed on nameplate	7.5 kW 10 PS	11 kW 15 PS	15 kW 20 PS
Power mains connector	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Mains input voltage	3x 380 VAC -15% to 480 VAC +10%		
Frequency	50 to 60 Hz ±5%		
Apparent power (at 380 VAC)	17.8 kVA	24.1 kVA	31.6 kVA
Mains current			
At 380 VAC	27 A	36.6 A	48 A
At 480 VAC	22.2 A	30 A	39 A
Integrated EMC filter	Yes ¹⁾		
Line-conducted and radiated emissions	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
With integrated filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		-	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		-	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤10 m / ≤5 m ²⁾	
With add-on filter	8I0FT035.300-1	8I0FT046.300-1	8I0FT072.300-1
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)	≤50 m / ≤20 m ³⁾	≤50 m / ≤20 m ³⁾	≤100 m ⁴⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)	≤100 m / ≤50 m ⁵⁾	≤100 m / ≤50 m ⁵⁾	≤300 m / ≤200 m ⁶⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)	≤100 m / ≤50 m ⁵⁾	≤100 m / ≤50 m ⁵⁾	≤300 m / ≤200 m ⁶⁾
Motor connection	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Max. continuous output current (I _n)			
At 380 VAC	17.6 A ⁷⁾	27.7 A ⁷⁾	33 A ⁷⁾
At 460 VAC	14 A ⁷⁾	21 A ⁷⁾	27 A ⁷⁾
Max. transient current for 60 s	26.4 A	41.6 A	49.5 A
Max. transient current for 2 s	29 A	45.7 A	54.5 A
Output frequency range	0.5 to 599 Hz		
Nominal clock frequency	4 kHz		
Motor closed loop control profiles			
Induction motor	Flux vector control (FVC) with encoder (voltage vector) (current vector) Flux vector control (SFVC) without encoder (voltage or current vector) Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) ENA energy adjustment system for asymmetrical loads		
Brake chopper	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Integrated dynamic brake transistors	Yes		
Min. resistance value (external)	19 Ω ⁸⁾	12 Ω ⁸⁾	7 Ω ⁸⁾
24 VDC supply	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)		
Power consumption	30 W		
Safe input - Power removal	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Quantity	1		
Nominal voltage	24 VDC		
Input circuit	Sink		

8I84T400750.01P-1, 8I84T401100.01P-1, 8I84T401500.01P-1

Interfaces	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Type		POWERLINK and CANopen	
Digital inputs	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Quantity		6 ⁹⁾	
Nominal voltage		24 VDC	
Input circuit		Source or sink	
Analog inputs	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Quantity		2	
Input			
Voltage		±10 V	
Voltage/Current		0 to 10 V or 0 to 20 mA	
Resolution		±11 bits	
Relay outputs	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		Max. 2 A at 250 VAC or 30 VDC with resistive load	
Design			
Relay 1		1 N.O. contact and 1 N.C. contact with a common point	
Relay 2		1 N.O. contact	
Analog outputs	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Quantity		1	
Output		0 to 10 V or 0 to 20 mA ¹⁰⁾	
Resolution		10-bit	
Operating conditions	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
EN 60529 protection		Upper part: IP21 and IP41 Lower part: IP54 (heat sink)	
Ambient temperature		-10 to 50°C	
Max. ambient temperature		Up to 60°C	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1		2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3		Class 3C1 and 3S2	
Operating position		Vertical installation ±10%	
Mechanical characteristics	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Dimensions			
Width	175 mm	210 mm	230 mm
Height	295 mm	295 mm	400 mm
Depth	187 mm	213 mm	213 mm

¹⁾ Shield plate included in delivery

²⁾ For shielded motor cables
≤10 m → At a clock frequency of 4 kHz
≤5 m → At a clock frequency of 4.1 to 16 kHz

³⁾ For shielded motor cables
≤50 m → At a clock frequency of 4 kHz
≤20 m → At a clock frequency of 4.1 to 16 kHz

⁴⁾ For shielded motor cables
≤100 m → at a clock frequency of 3.5 to 4 kHz and at a clock frequency of 4.1 to 12 kHz

⁵⁾ For shielded motor cables
≤100 m → At a clock frequency of 4 kHz
≤50 m → At a clock frequency of 4.1 to 16 kHz

⁶⁾ For shielded motor cables
≤300 m → At a clock frequency of 3.5 to 4 kHz
≤200 m → At a clock frequency of 4.1 to 12 kHz

⁷⁾ These values apply at the rated clock frequency.

⁸⁾ The min. resistance value is specified at a temperature of 20°C. In environments with temperatures over 20°C, the min. resistance listed in the table must be used.

⁹⁾ 1 logic input, configurable as a logic input or PTC sensor input using a switch. Input for max. 6 PTC sensors in series: Rated value <1.5 kΩ, 3 kΩ trigger resistance, 1.8 kΩ reset value, short circuit protection <50 Ω

¹⁰⁾ The analog output is configurable as a logic output.

3-phase ACOPOSinverter P84, 380 to 480 V

8184T401850.01P-1, 8184T402200.01P-1, 8184T403000.01P-1



ETHERNET 
POWERLINK

CANopen

Motor power	8184T401850.01P-1	8184T402200.01P-1	8184T403000.01P-1
Listed on nameplate	18.5 kW 25 PS	22 kW 30 PS	30 kW 40 PS
Power mains connector	8184T401850.01P-1	8184T402200.01P-1	8184T403000.01P-1
Mains input voltage	3x 380 VAC -15% to 480 VAC +10%		
Frequency	50 to 60 Hz ±5%		
Apparent power (at 380 VAC)	29.9 kVA	32.9 kVA	43.4 kVA
Mains current			
At 380 VAC	45.5 A	50 A	66 A
At 480 VAC	37.5 A	42 A	56 A
Integrated EMC filter	Yes ¹⁾		
Line-conducted and radiated emissions	8184T401850.01P-1	8184T402200.01P-1	8184T403000.01P-1
With integrated filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		-	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		-	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤50 m / ≤25 m ²⁾	
With add-on filter	810FT072.300-1	810FT090.300-1	810FT092.300-1
With add-on filter			
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		≤100 m ³⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		≤300 m / ≤200 m ⁴⁾	
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤300 m / ≤200 m ⁴⁾	
Motor connection	8184T401850.01P-1	8184T402200.01P-1	8184T403000.01P-1
Max. continuous output current (I _n)			
At 380 VAC	41 A ⁵⁾	48 A ⁵⁾	66 A ⁵⁾
At 460 VAC	34 A ⁵⁾	40 A ⁵⁾	56 A ⁵⁾
Max. transient current for 60 s	61.5 A	72 A	99 A
Max. transient current for 2 s	67.7 A	79.2 A	109 A
Output frequency range	0.5 to 599 Hz		
Nominal clock frequency	4 kHz		
Motor closed loop control profiles			
Induction motor	Flux vector control (FVC) with encoder (voltage vector) (current vector) Flux vector control (SFVC) without encoder (voltage or current vector) Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) ENA energy adjustment system for asymmetrical loads		
Brake chopper	8184T401850.01P-1	8184T402200.01P-1	8184T403000.01P-1
Integrated dynamic brake transistors	Yes		
Min. resistance value (external)	7 Ω ⁶⁾	13.3 Ω ⁶⁾	13.3 Ω ⁶⁾
24 VDC supply	8184T401850.01P-1	8184T402200.01P-1	8184T403000.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)		
Power consumption	30 W		
Safe input - Power removal	8184T401850.01P-1	8184T402200.01P-1	8184T403000.01P-1
Quantity	1		
Nominal voltage	24 VDC		
Input circuit	Sink		

8I84T401850.01P-1, 8I84T402200.01P-1, 8I84T403000.01P-1

Interfaces	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Type		POWERLINK and CANopen	
Digital inputs	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Quantity		6 ⁷⁾	
Nominal voltage		24 VDC	
Input circuit		Source or sink	
Analog inputs	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Quantity		2	
Input			
Voltage		±10 V	
Voltage/Current		0 to 10 V or 0 to 20 mA	
Resolution		±11 bits	
Relay outputs	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Quantity		2	
Nominal voltage		30 VDC / 250 VAC	
Switching capacity		Max. 2 A at 250 VAC or 30 VDC with resistive load	
Design			
Relay 1		1 N.O. contact and 1 N.C. contact with a common point	
Relay 2		1 N.O. contact	
Analog outputs	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Quantity		1	
Output		0 to 10 V or 0 to 20 mA ⁸⁾	
Resolution		10-bit	
Operating conditions	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
EN 60529 protection		Upper part: IP21 and IP41 Lower part: IP54 (heat sink)	
Ambient temperature		-10 to 50°C	
Max. ambient temperature		Up to 60°C	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1		2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3		Class 3C1 and 3S2	
Operating position		Vertical installation ±10%	
Mechanical characteristics	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Dimensions			
Width	230 mm	240 mm	240 mm
Height	400 mm	420 mm	550 mm
Depth	213 mm	236 mm	266 mm

¹⁾ Shield plate included in delivery

²⁾ For shielded motor cables
≤50 m → At a clock frequency of 4 kHz
≤25 m → At a clock frequency of 4.1 to 16 kHz

³⁾ For shielded motor cables
≤100 m → at a clock frequency of 3.5 to 4 kHz and at a clock frequency of 4.1 to 12 kHz

⁴⁾ For shielded motor cables
≤300 m → At a clock frequency of 3.5 to 4 kHz
≤200 m → At a clock frequency of 4.1 to 12 kHz

⁵⁾ These values apply at the rated clock frequency.

⁶⁾ The min. resistance value is specified at a temperature of 20°C. In environments with temperatures over 20°C, the min. resistance listed in the table must be used.

⁷⁾ 1 logic input, configurable as a logic input or PTC sensor input using a switch. Input for max. 6 PTC sensors in series: Rated value <1.5 kΩ, 3 kΩ trigger resistance, 1.8 kΩ reset value, short circuit protection <50 Ω

⁸⁾ The analog output is configurable as a logic output.

3-phase ACOPOSinverter P84, 380 to 480 V

8184T403700.01P-1, 8184T404500.01P-1



ETHERNET 
POWERLINK

CANopen

Motor power	8184T403700.01P-1	8184T404500.01P-1
Listed on nameplate	37 kW 50 PS	45 kW 60 PS
Power mains connector	8184T403700.01P-1	8184T404500.01P-1
Mains input voltage	3x 380 VAC -15% to 480 VAC +10%	
Frequency	50 to 60 Hz ±5%	
Apparent power (at 380 VAC)	55.3 kVA	68.5 kVA
Mains current		
At 380 VAC	84 A	104 A
At 480 VAC	69 A	85 A
Integrated EMC filter	Yes ¹⁾	
Line-conducted and radiated emissions	8184T403700.01P-1	8184T404500.01P-1
With integrated filter		
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		-
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		-
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤50 m / ≤25 m ²⁾
With add-on filter	810FT092.300-1	810FT180.300-1
With add-on filter		
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		≤100 m ³⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		≤300 m / ≤200 m ⁴⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤300 m / ≤200 m ⁴⁾
Motor connection	8184T403700.01P-1	8184T404500.01P-1
Max. continuous output current (I _n)		
At 380 VAC	79 A ⁵⁾	94 A ⁵⁾
At 460 VAC	65 A ⁵⁾	77 A ⁵⁾
Max. transient current for 60 s	118.5 A	141 A
Max. transient current for 2 s	130 A	155 A
Output frequency range	0.5 to 599 Hz	0.5 to 500 Hz
Nominal clock frequency	2.5 kHz	
Motor closed loop control profiles		
Induction motor	Flux vector control (FVC) with encoder (voltage vector) (current vector) Flux vector control (SFVC) without encoder (voltage or current vector) Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) ENA energy adjustment system for asymmetrical loads	
Brake chopper	8184T403700.01P-1	8184T404500.01P-1
Integrated dynamic brake transistors		Yes
Min. resistance value (external)	6.7 Ω ⁶⁾	5 Ω ⁶⁾
24 VDC supply	8184T403700.01P-1	8184T404500.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	
Power consumption	30 W	
Safe input - Power removal	8184T403700.01P-1	8184T404500.01P-1
Quantity	1	
Nominal voltage	24 VDC	
Input circuit	Sink	

8I84T403700.01P-1, 8I84T404500.01P-1

Interfaces	8I84T403700.01P-1	8I84T404500.01P-1
Type	POWERLINK and CANopen	
Digital inputs	8I84T403700.01P-1	8I84T404500.01P-1
Quantity	6 ⁷⁾	
Nominal voltage	24 VDC	
Input circuit	Source or sink	
Analog inputs	8I84T403700.01P-1	8I84T404500.01P-1
Quantity	2	
Input		
Voltage	±10 V	
Voltage/Current	0 to 10 V or 0 to 20 mA	
Resolution	±11 bits	
Relay outputs	8I84T403700.01P-1	8I84T404500.01P-1
Quantity	2	
Nominal voltage	30 VDC / 250 VAC	
Switching capacity	Max. 2 A at 250 VAC or 30 VDC with resistive load	
Design		
Relay 1	1 N.O. contact and 1 N.C. contact with a common point	
Relay 2	1 N.O. contact	
Analog outputs	8I84T403700.01P-1	8I84T404500.01P-1
Quantity	1	
Output	0 to 10 V or 0 to 20 mA ⁸⁾	
Resolution	10-bit	
Operating conditions	8I84T403700.01P-1	8I84T404500.01P-1
EN 60529 protection	Upper part: IP21 and IP41 Lower part: IP54 (heat sink)	
Ambient temperature	-10 to 50°C	
Max. ambient temperature	Up to 60°C	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1	2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3	Class 3C1 and 3S2	
Operating position	Vertical installation ±10%	
Mechanical characteristics	8I84T403700.01P-1	8I84T404500.01P-1
Dimensions		
Width	240 mm	320 mm
Height	550 mm	630 mm
Depth	266 mm	290 mm

¹⁾ Shield plate included in delivery

²⁾ For shielded motor cables
 ≤50 m → At a clock frequency of 2 to 2.5 kHz
 ≤25 m → At a clock frequency of 2.6 to 12 kHz

³⁾ For shielded motor cables
 ≤100 m → At a clock frequency of 2 to 2.5 kHz and at a clock frequency of 2.6 to 12 kHz

⁴⁾ For shielded motor cables
 ≤300 m → At a clock frequency of 2 to 2.5 kHz
 ≤200 m → At a clock frequency of 2.6 to 12 kHz

⁵⁾ These values apply at the rated clock frequency.

⁶⁾ The min. resistance value is specified at a temperature of 20°C. In environments with temperatures over 20°C, the min. resistance listed in the table must be used.

⁷⁾ 1 logic input, configurable as a logic input or PTC sensor input using a switch. Input for max. 6 PTC sensors in series: Rated value <1.5 kΩ, 3 kΩ trigger resistance, 1.8 kΩ reset value, short circuit protection <50 Ω

⁸⁾ The analog output is configurable as a logic output.

3-phase ACOPOSinverter P84, 380 to 480 V

8184T405500.01P-1, 8184T407500.01P-1



ETHERNET 
POWERLINK

CANopen

Motor power	8184T405500.01P-1	8184T407500.01P-1
Listed on nameplate	55 kW 75 PS	75 kW 100 PS
Power mains connector	8184T405500.01P-1	8184T407500.01P-1
Mains input voltage	3x 380 VAC -15% to 480 VAC +10%	
Frequency	50 to 60 Hz ±5%	
Apparent power (at 380 VAC)	79 kVA	109.9 kVA
Mains current		
At 380 VAC	120 A	167 A
At 480 VAC	101 A	137 A
Integrated EMC filter	Yes ¹⁾	
Line-conducted and radiated emissions	8184T405500.01P-1	8184T407500.01P-1
With integrated filter		
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		-
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		-
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤50 m / ≤25 m ²⁾
With add-on filter	810FT180.300-1	
With add-on filter		
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C1 environment 1 (public mains)		≤100 m ³⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C2 environment 1 (public mains)		≤300 m / ≤200 m ⁴⁾
Motor cable length in accordance with IEC/ EN 61800-3 Cat. C3 environment 2 (industrial mains)		≤300 m / ≤200 m ⁴⁾
Motor connection	8184T405500.01P-1	8184T407500.01P-1
Max. continuous output current (I _n)		
At 380 VAC	116 A ⁵⁾	160 A ⁵⁾
At 460 VAC	96 A ⁵⁾	124 A ⁵⁾
Max. transient current for 60 s	174 A	240 A
Max. transient current for 2 s	191 A	264 A
Output frequency range	0.5 to 500 Hz	
Nominal clock frequency	2.5 kHz	
Motor closed loop control profiles		
Induction motor	Flux vector control (FVC) with encoder (voltage vector) (current vector) Flux vector control (SFVC) without encoder (voltage or current vector) Voltage/Frequency ratio - V/f characteristic curve (2 or 5 points) ENA energy adjustment system for asymmetrical loads	
Brake chopper	8184T405500.01P-1	8184T407500.01P-1
Integrated dynamic brake transistors	Yes	
Min. resistance value (external)	5 Ω ⁶⁾	3.3 Ω ⁶⁾
24 VDC supply	8184T405500.01P-1	8184T407500.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	
Power consumption	30 W	
Safe input - Power removal	8184T405500.01P-1	8184T407500.01P-1
Quantity	1	
Nominal voltage	24 VDC	
Input circuit	Sink	

8I84T405500.01P-1, 8I84T407500.01P-1

Interfaces	8I84T405500.01P-1	8I84T407500.01P-1
Type	POWERLINK and CANopen	
Digital inputs	8I84T405500.01P-1	8I84T407500.01P-1
Quantity	6 ⁷⁾	
Nominal voltage	24 VDC	
Input circuit	Source or sink	
Analog inputs	8I84T405500.01P-1	8I84T407500.01P-1
Quantity	2	
Input		
Voltage	±10 V	
Voltage/Current	0 to 10 V or 0 to 20 mA	
Resolution	±11 bits	
Relay outputs	8I84T405500.01P-1	8I84T407500.01P-1
Quantity	2	
Nominal voltage	30 VDC / 250 VAC	
Switching capacity	Max. 2 A at 250 VAC or 30 VDC with resistive load	
Design		
Relay 1	1 N.O. contact and 1 N.C. contact with a common point	
Relay 2	1 N.O. contact	
Analog outputs	8I84T405500.01P-1	8I84T407500.01P-1
Quantity	1	
Output	0 to 10 V or 0 to 20 mA ⁸⁾	
Resolution	10-bit	
Operating conditions	8I84T405500.01P-1	8I84T407500.01P-1
EN 60529 protection	Upper part: IP21 and IP41 Lower part: IP54 (heat sink)	
Ambient temperature	-10 to 50°C	
Max. ambient temperature	Up to 60°C	
Max. degree of pollution in accordance with IEC/ EN 61800-5-1	2 (non-conductive pollution)	
Environmental conditions in accordance with IEC 60721-3-3	Class 3C1 and 3S2	
Operating position	Vertical installation ±10%	
Mechanical characteristics	8I84T405500.01P-1	8I84T407500.01P-1
Dimensions		
Width	320 mm	
Height	630 mm	
Depth	290 mm	

¹⁾ Shield plate included in delivery

²⁾ For shielded motor cables
≤50 m → At a clock frequency of 2 to 2.5 kHz
≤25 m → At a clock frequency of 2.6 to 12 kHz

³⁾ For shielded motor cables
≤100 m → At a clock frequency of 2 to 2.5 kHz and at a clock frequency of 2.6 to 12 kHz

⁴⁾ For shielded motor cables
≤300 m → At a clock frequency of 2 to 2.5 kHz
≤200 m → At a clock frequency of 2.6 to 12 kHz

⁵⁾ These values apply at the rated clock frequency.

⁶⁾ The min. resistance value is specified at a temperature of 20°C. In environments with temperatures over 20°C, the min. resistance listed in the table must be used.

⁷⁾ 1 logic input, configurable as a logic input or PTC sensor input using a switch. Input for max. 6 PTC sensors in series: Rated value <1.5 kΩ, 3 kΩ trigger resistance, 1.8 kΩ reset value, short circuit protection <50 Ω

⁸⁾ The analog output is configurable as a logic output.

Additional EMC filters for ACOPOSinverter P74 and P84

Additional EMC filters for ACOPOSinverter P74 and P84



- Additional EMC filters are intended to reduce line-conducted emissions from the mains supply to a level under the limits specified in IEC/EN 61800-3, Category C1, C2 or C3 in Environment 1 (public mains) or 2 (industrial mains) depending on the power of the inverter.
- The data for determining the permitted length of the shielded motor cable is listed in the technical data for ACOPOSinverter P74 and P84 devices under "Line-conducted and radiated emissions".
- Additional EMC filters can only be used for TN (neutral) and TT (neutral-ground) connection types.

Model number	For ACOPOSinverter P74
810FS009.200-2	1-phase 9 A, side installation, 1x 200 to 240 V, 0.18 to 0.75 kW
810FS016.200-1	1-phase 16 A, side installation, 1x 200 to 240 V, 1.1 to 1.5 kW
810FS022.200-1	1-phase 22 A, side installation, 1x 200 to 240 V, 2.2 kW
810FT015.200-1	3-phase 15 A, side installation, 3x 380 to 500 V, 0.37 to 1.5 kW
810FT025.200-1	3-phase 25 A, side installation, 3x 380 to 500 V, 2.2 to 4 kW
810FT047.200-1	3-phase 47 A, bottom or side installation, 3x 380 to 500 V, 5.5 to 7.5 kW
810FT049.200-1	3-phase 49 A, bottom or side installation, 3x 380 to 500 V, 11 to 15 kW

Model number	For ACOPOSinverter P84
810FT012.300-1	3-phase 12 A, bottom or side installation, 3x 200 to 240 V, 0.37 to 1.5 kW and 3x 380 to 480 V, 0.75 to 2.2 kW
810FT026.300-1	3-phase 26 A, bottom or side installation, 3x 200 to 240 V, 2.2 to 4 kW and 3x 380 to 480 V, 3 to 4 kW
810FT035.300-1	3-phase 35 A, bottom or side installation, 3x 200 to 240 V, 5.5 kW and 3x 380 to 480 V, 5.5 to 7.5 kW
810FT046.300-1	3-phase 46 A, bottom or side installation, 3x 200 to 240 V, 7.5 kW and 3x 380 to 480 V, 11 kW
810FT072.300-1	3-phase 72 A, bottom or side installation, 3x 200 to 240 V, 7.5 kW and 3x 380 to 480 V, 11 kW
810FT090.300-1	3-phase 90 A, bottom or side installation, 3x 200 to 240 V, 18.5 to 22 kW and 3x 380 to 480 V, 22 kW
810FT092.300-1	3-phase 92 A, bottom or side installation, 3x 380 to 480 V, 37 kW
810FT180.300-1	3-phase 180 A, bottom or side installation, 3x 380 to 480 V, 37 kW

Additional EMC filters for ACOPOSinverter P74

810FS009.200-2, 810FS016.200-1, 810FS022.200-1, 810FT015.200-1



	810FS009.200-2	810FS016.200-1	810FS022.200-1	810FT015.200-1
Power mains connector				
Power loss	3.7 W	6.9 W	7.5 W	9.9 W
Max. nominal voltage	1x 240 VAC +10%	1x 240 VAC +10%	1x 240 VAC +10%	3x 500 VAC +10%
Nominal filter current	9 A	16 A	22 A	15 A
Max. fault current	100 mA	150 mA	80 mA	15 mA
Operating conditions	810FS009.200-2	810FS016.200-1	810FS022.200-1	810FT015.200-1
EN 60529 protection	IP20 and IP41 on the upper part	IP21 and IP41 on the upper part	IP21 and IP41 on the upper part	IP21 and IP41 on the upper part
Max. relative humidity in accordance with IEC 60068-2-3	93%, non-condensing No dripping water	95%, non-condensing No dripping water	95%, non-condensing No dripping water	95%, non-condensing No dripping water
Ambient temperature	-10 to 50°C	-10 to 60°C	-10 to 60°C	-10 to 60°C
Mechanical characteristics	810FS009.200-2	810FS016.200-1	810FS022.200-1	810FT015.200-1
Installation	Below or next to the inverter			
General information	810FS009.200-2	810FS016.200-1	810FS022.200-1	810FT015.200-1
Conformity to standard	EN 133200			

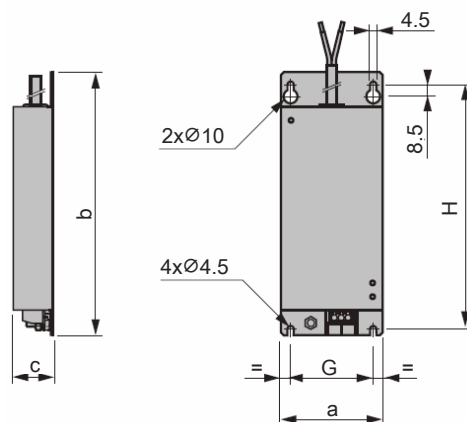
Additional EMC filters for ACOPOSinverter P74

810FT025.200-1, 810FT047.200-1, 810FT049.200-1

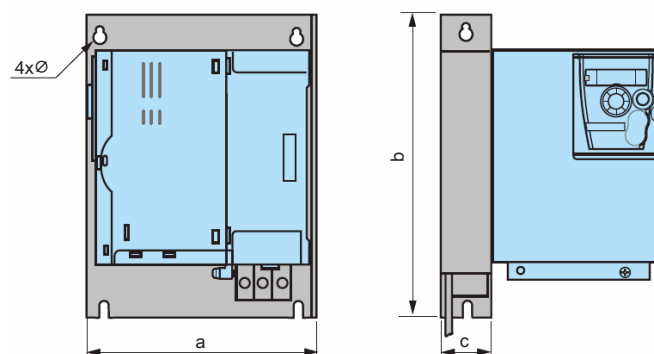


Power mains connector	810FT025.200-1	810FT047.200-1	810FT049.200-1
Power loss	15.8 W	19.3 W	27.4 W
Max. nominal voltage		3x 500 VAC +10%	
Nominal filter current	25 A	47 A	49 A
Max. fault current	35 mA	45 mA	45 mA
Operating conditions	810FT025.200-1	810FT047.200-1	810FT049.200-1
EN 60529 protection		IP21 and IP41 on the upper part	
Max. relative humidity in accordance with IEC 60068-2-3		95%, non-condensing No dripping water	
Ambient temperature		-10 to 60°C	
Mechanical characteristics	810FT025.200-1	810FT047.200-1	810FT049.200-1
Installation		Below or next to the inverter	
General information	810FT025.200-1	810FT047.200-1	810FT049.200-1
Conformity to standard		EN 133200	

Installing the filter below the frequency inverter



Installing the filter next to the frequency inverter



	a	b	c	G	H	Ø
810FS009.200-2	72	185	50	60	121.5	4.5
810FS016.200-1	107	195	35	85	180	4.5
810FS022.200-1	140	235	35	120	215	4.5
810FT015.200-1	107	195	42	85	180	4.5
810FT025.200-1	140	235	50	120	15	4.5
810FT047.200-1	180	305	60	140	285	5.5
810FT049.200-1	245	395	60	205	375	5.5

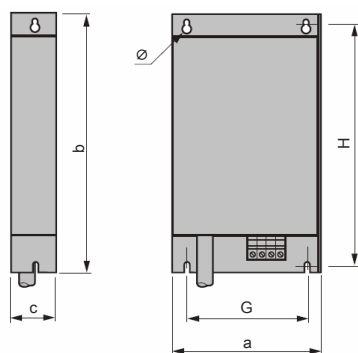
Additional EMC filters for ACOPOSinverter P84

810FT012.300-1, 810FT026.300-1, 810FT035.300-1



Power mains connector	810FT012.300-1	810FT026.300-1	810FT035.300-1
Max. nominal voltage		3x 480 VAC +10%	
Nominal filter current	12 A	26 A	35 A
Max. fault current			
At 200 to 240 VAC	4 mA	4.4 mA	3 mA
At 380 to 480 VAC	7 mA	8 mA	7 mA
Power loss			
At 200 to 240 VAC	10 W	18 W	24 W
At 380 to 480 VAC	5 W	6 W	14 W
Operating conditions	810FT012.300-1	810FT026.300-1	810FT035.300-1
EN 60529 protection		Upper part: IP21 and IP41	
Max. relative humidity in accordance with IEC 60068-2-3		93%, non-condensing No dripping water	
Ambient temperature		-10 to 50°C	
Mechanical characteristics	810FT012.300-1	810FT026.300-1	810FT035.300-1
Installation		Below or next to the inverter	
General information	810FT012.300-1	810FT026.300-1	810FT035.300-1
Conformity to standard		EN 133200	

Dimensions



	a	b	c	G	H	Ø
810FT012.300-1	130	290	40	105	275	4.5
810FT026.300-1	155	324	50	130	309	4.5
810FT035.300-1	175	370	60	150	355	6.5

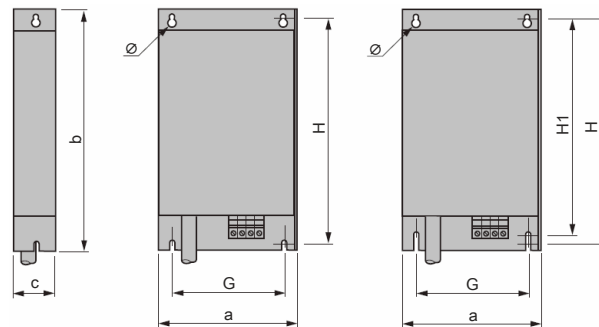
Additional EMC filters for ACOPOSinverter P84

810FT046.300-1, 810FT072.300-1



Power mains connector	810FT046.300-1	810FT072.300-1
Max. nominal voltage		3x 480 VAC +10%
Nominal filter current	46 A	72 A
Max. fault current		
At 200 to 240 VAC	10 mA	33 mA
At 380 to 480 VAC	14 mA	60 mA
Power loss		
At 200 to 240 VAC	19 W	34 W
At 380 to 480 VAC	13 W	14 W
Operating conditions	810FT046.300-1	810FT072.300-1
EN 60529 protection		Upper part: IP21 and IP41
Max. relative humidity in accordance with IEC 60068-2-3		93%, non-condensing No dripping water
Ambient temperature		-10 to 50°C
Mechanical characteristics	810FT046.300-1	810FT072.300-1
Installation		Below or next to the inverter
General information	810FT046.300-1	810FT072.300-1
Conformity to standard		EN 133200

Dimensions



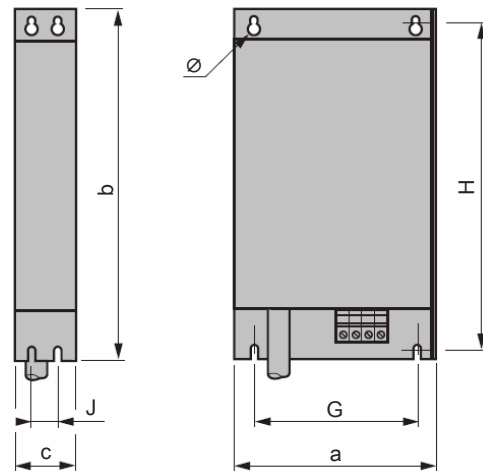
	a	b	c	G	H	H1	Ø
810FT046.300-1	210	380	60	190	365	-	6.5
810FT072.300-1	230	498.5	62	190	479.5	460	6.5

810FT090.300-1, 810FT092.300-1, 810FT180.300-1



Power mains connector	810FT090.300-1	810FT092.300-1	810FT180.300-1
Max. nominal voltage		3x 480 VAC +10%	
Nominal filter current	90 A	92 A	180 A
Max. fault current			
At 200 to 240 VAC	33 mA	-	80 mA
At 380 to 480 VAC	60 mA	60 mA	140 mA
Power loss			
At 200 to 240 VAC	34 W	-	58 W
At 380 to 480 VAC	11 W	30 W	58 W
Operating conditions	810FT090.300-1	810FT092.300-1	810FT180.300-1
EN 60529 protection		Upper part: IP21 and IP41	
Max. relative humidity in accordance with IEC 60068-2-3		93%, non-condensing No dripping water	
Ambient temperature		-10 to 50°C	
Mechanical characteristics	810FT090.300-1	810FT092.300-1	810FT180.300-1
Installation		Below or next to the inverter	
General information	810FT090.300-1	810FT092.300-1	810FT180.300-1
Conformity to standard		EN 133200	

Dimensions



	a	b	c	G	H	J	Ø
810FT090.300-1	240	522	79	200	502.5	40	9
810FT092.300-1	240	650	79	200	631	40	9
810FT180.300-1	320	750	119	280	725	80	9

Mains chokes for ACOPOSinverter P74 and P84

Mains chokes for ACOPOSinverter P74 and P84



- Improved protection against overvoltages in the mains supply and reduction of the distortion factor in the power produced by the inverter
- Limitation of the mains current
- Using mains chokes is recommended when the following conditions apply:
 - Multiple inverters connected in parallel with little space between them
 - Mains supply with disturbances from other devices (interference, overvoltage)
 - Mains supply with asymmetrical voltages between phases $>1.8\%$ of the rated voltage
 - Inverters supplied via single line with very low impedance
 - Large number of frequency inverters connected on one line
 - Reduction of overloads on capacitors for cosine ϕ correction if the system has equipment for power factor correction

Model number	For ACOPOSinverter P74 and P84
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8IOCT004.000-1	3-phase 4 A, 3x 380 to 500 V, 0.37 to 1.5 kW
8IOCT010.000-1	3-phase 10 A, 3x 380 to 500 V, 2.2 to 4 kW
8IOCT016.000-1	3-phase 16 A, 3x 380 to 500 V, 5.5 to 7.5 kW
8IOCT030.000-1	3-phase 30 A, 3x 380 to 500 V, 11 to 15 kW

Model number	For ACOPOSinverter P74
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8IOCS004.000-1	1-phase 4 A, 1x 200 to 240 V, 0.18 to 0.37 kW
8IOCS007.000-1	1-phase 7 A, 1x 200 to 240 V, 0.55 to 0.75 kW
8IOCS018.000-1	1-phase 18 A, 1x 200 to 240 V, 1.1 to 2.2 kW

Model number	For ACOPOSinverter P84
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8IOCS025.000-1	1-phase 25 A, 1x 200 to 240 V, 3 kW
8IOCS045.000-1	3-phase 45 A, 3x 200 to 240 V, 0.37 to 0.75 kW and 3x 380 to 480 V, 0.75 to 1.5 kW
8IOCT060.000-1	3-phase 60 A, 3x 200 to 240 V, 7.5 to 11 kW and 3x 380 to 480 V, 18.5 to 22 kW
8IOCT100.000-1	3-phase 100 A, 3x 200 to 240 V, 15 kW and 3x 380 to 480 V, 30 to 55 kW
8IOCT184.000-1	3-phase 184 A, 3x 380 to 480 V, 75 to 90 kW
8IOCT230.000-1	3-phase 230 A, 3x 200 to 240 V, 18.5 to 45 kW

Mains chokes for ACOPOSinverter P74 and P84

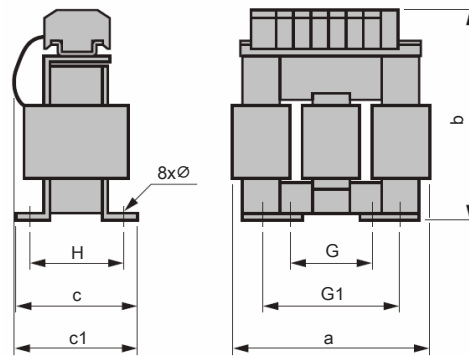
810CT004.000-1, 810CT010.000-1, 810CT016.000-1, 810CT030.000-1

Power mains connector	810CT004.000-1	810CT010.000-1	810CT016.000-1	810CT030.000-1
Power loss	45 W	65 W	75 W	90 W
Inductance	10 mH	4 mH	2 mH	1 mH
Nominal current	4 A ¹⁾	10 A ¹⁾	16 A ¹⁾	30 A ¹⁾
Voltage drop	From 3 to 5% of the nominal supply voltage, higher values result in torque loss			
Saturation current	-			
Operating conditions	810CT004.000-1	810CT010.000-1	810CT016.000-1	810CT030.000-1
Protection	IP00			
Choke	IP20			
Terminals	IP20	IP20	IP20	IP10
Max. relative humidity	95%, non-condensing No dripping water			
Ambient temperature	0 to 45°C			
Max. ambient temperature	Up to 55°C ²⁾			
General information	810CT004.000-1	810CT010.000-1	810CT016.000-1	810CT030.000-1
Conformity to standard	IEC 61800-5-1 (protection level 1 regarding overvoltages in the mains supply according to VDE 0160)			

¹⁾ Max. current = 1.65 x rated current for 60 seconds.

²⁾ With current reduction of 2% per °C above 45°C.

Dimensions



	a	b	c	c1	G	G1	H	Ø
810CT004.000-1	100	135	55	60	40	60	42	6x9
810CT010.000-1	130	155	85	90	60	80.5	62	6x12
810CT016.000-1	130	155	85	90	60	80.5	62	6x12
810CT030.000-1	155	170	115	135	75	107	90	6x12

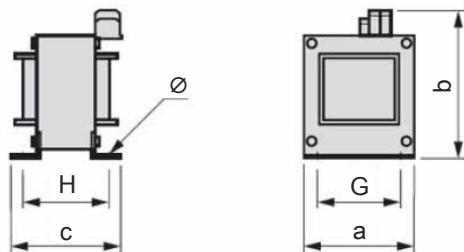
Mains chokes for ACOPOSinverter P74

810CS004.000-1, 810CS007.000-1, 810CS018.000-1

Power mains connector	810CS004.000-1	810CS007.000-1	810CS018.000-1
Power loss	17 W	20 W	30 W
Inductance	10 mH	5 mH	2 mH
Nominal current	4 A	7 A	18 A
Voltage drop	From 3 to 5% of the nominal supply voltage, higher values result in torque loss		
Operating conditions	810CS004.000-1	810CS007.000-1	810CS018.000-1
Protection			
Choke		IP00	
Terminals		IP20	
Max. relative humidity		95%, non-condensing No dripping water	
Ambient temperature		0 to 45°C	
Max. ambient temperature		Up to 55°C ¹⁾	
General information	810CS004.000-1	810CS007.000-1	810CS018.000-1
Conformity to standard	IEC 61800-5-1 (protection level 1 regarding overvoltages in the mains supply according to VDE 0160)		

¹⁾ With current reduction of 2% per °C above 45°C.

Dimensions



	a	b	c	G	H	Ø
810CS004.000-1	60	100	80	50	44	4x9
810CS007.000-1	60	100	95	50	60	4x9
810CS018.000-1	85	120	105	70	70	5x11

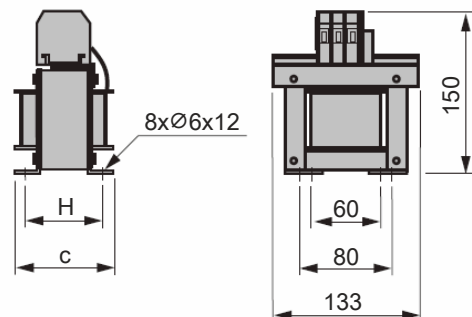
Mains chokes for ACOPOSinverter P84

810CS025.000-1, 810CS045.000-1

Power mains connector	810CS025.000-1	810CS045.000-1
Power loss		50 W
Inductance	2 mH	1 mH
Nominal current	25 A	45 A
Voltage drop	From 3 to 5% of the rated supply voltage. Higher values result in torque loss.	
Operating conditions	810CS025.000-1	810CS045.000-1
Protection		
Choke		IP00
Terminals		IP20
Max. relative humidity	95%, non-condensing No dripping water	
Ambient temperature	0 to 45°C	
Max. ambient temperature	Up to 55°C ¹⁾	
General information	810CS025.000-1	810CS045.000-1
Conformity to standard	IEC 61800-5-1 (protection level 1 regarding overvoltages in the mains supply according to VDE 0160)	

¹⁾ With current reduction of 2% per °C above 45°C.

Dimensions



	c	H
810CS025.000-1	95	65
810CS045.000-1	105	77

Mains chokes for ACOPOSinverter P84

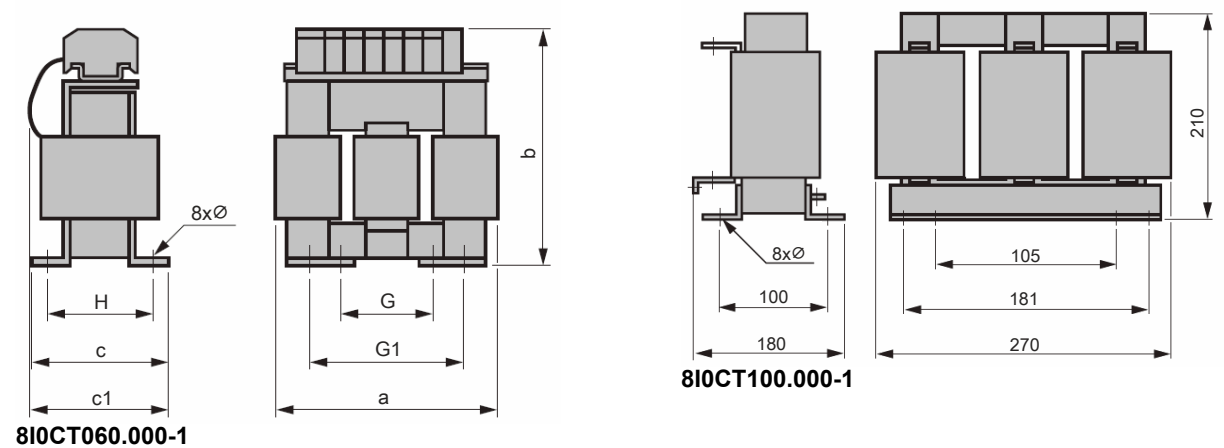
810CT060.000-1, 810CT100.000-1

Power mains connector	810CT060.000-1	810CT100.000-1
Power loss	94 W	260 W
Inductance	0.5 mH	0.3 mH
Nominal current	60 A ¹⁾	100 A ¹⁾
Voltage drop	From 3 to 5% of the rated supply voltage. Higher values result in torque loss.	
Saturation current	-	
Operating conditions	810CT060.000-1	810CT100.000-1
Protection		
Choke		IP00
Terminals	IP10	IP00
Max. relative humidity	95%, non-condensing No dripping water	
Ambient temperature	0 to 45°C	
Max. ambient temperature	Up to 55°C ²⁾	
General information	810CT060.000-1	810CT100.000-1
Conformity to standard	IEC 61800-5-1 (protection level 1 regarding overvoltages in the mains supply according to VDE 0160)	

¹⁾ Max. current = 1.65 x rated current for 60 seconds.

²⁾ With current reduction of 2% per °C above 45°C.

Dimensions



	a	b	c	c1	G	G1	H	Ø
810CT060.000-1	180	210	125	165	85	122	105	6x12
810CT100.000-1	Ø							11x22

810CT184.000-1, 810CT230.000-1

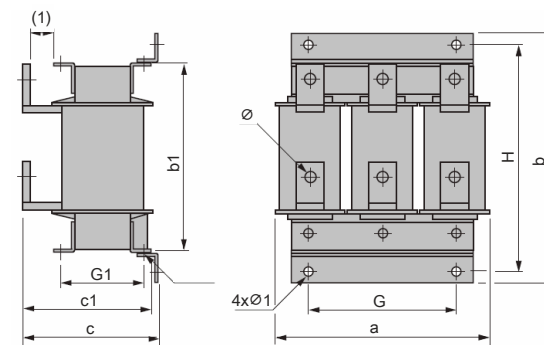
Power mains connector	810CT184.000-1	810CT230.000-1
Power loss	220 W	400 W
Inductance	0.155 mH	0.15 mH
Nominal current	184 A ¹⁾	230 A ¹⁾
Voltage drop	From 3 to 5% of the rated supply voltage. Higher values result in torque loss.	
Saturation current	370 A	-
Operating conditions	810CT184.000-1	810CT230.000-1
Protection		
Choke	IP00	
Terminals	IP00	
Max. relative humidity	95%, non-condensing No dripping water	
Ambient temperature	0 to 45°C	
Max. ambient temperature	Up to 55°C ²⁾	
General information	810CT184.000-1	810CT230.000-1
Conformity to standard	IEC 61800-5-1 (protection level 1 regarding overvoltages in the mains supply according to VDE 0160)	

¹⁾ Max. current = 1.65 x rated current for 60 seconds.

²⁾ With current reduction of 2% per °C above 45°C.

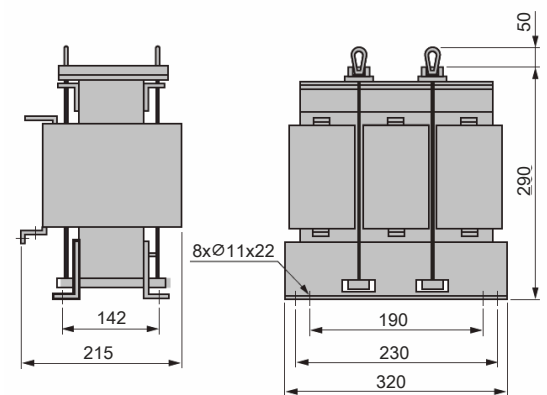
Dimensions

810CT184.000-1



(1) min. 25 mm

810CT230.000-1



	a	b	b1	c	c1	G	G1	H	Ø	Ø1	Ø2
810CT184.000-1	280	305	240	210	200	200	125	275	9	9	9

Braking resistors for ACOPOSinverter P74 and P84

Braking resistors for ACOPOSinverter P74 and P84

- Braking resistors allow the ACOPOSinverter device to continue running by redirecting the energy generated during braking when stopping or decelerating.
- It permits a maximum short-term braking torque.
- Although the resistors are intended to be mounted on the outside of the housing, they may not restrict the natural cooling of the system. Incoming and outgoing air must not be blocked.
- The air must be free of dust, condensation and corrosive gases.

Characteristic curve for braking resistors

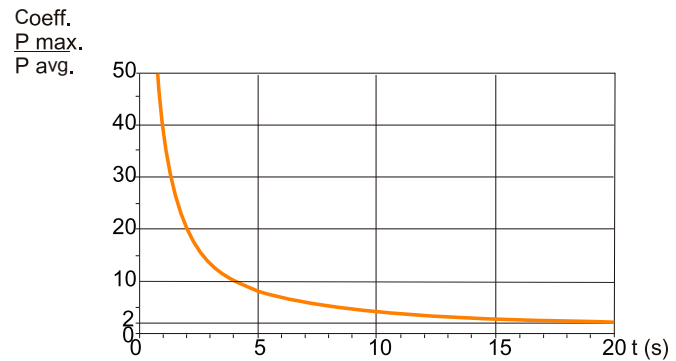
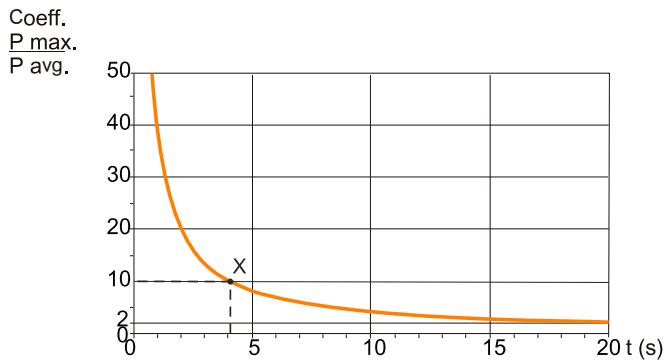
Example for using characteristic curves:

Model number	P continuous in kW	Model number	P continuous in kW
8I0BR100.000-1	0.05	8I0BR008.000-1	1
8I0BR060.000-1	0.1	8I0BR005.000-1	1.3
8I0BR028.000-1	0.2	8I0BR004.000-1	1
8I0BR015.000-1	1	8I0BR003.000-1	1
8I0BR010.000-1	1		

8I0BR100.000-1 (P continuous = 0.05 kW) for 100 Ω at 20°C

■ Point X

For a 120 second cycle, the 100 Ω resistor can handle an overload of 10 x 0.05 kW (continuous power) for 4 s, i.e. braking power equaling 0.5 kW every 120 s.



— P max./P avg. (120 s cycle)

Braking resistors for ACOPOSinverter P74 and P84

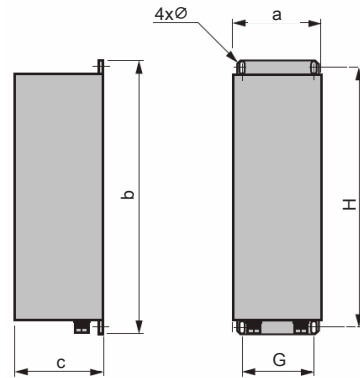
810BR100.000-1, 810BR060.000-1, 810BR028.000-1



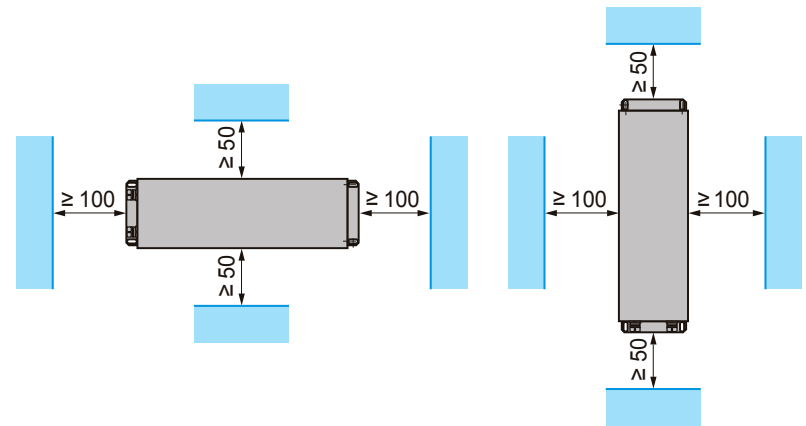
Operating conditions	810BR100.000-1	810BR060.000-1	810BR028.000-1
Rated protection of housing		IP20	
Ambient temperature		0 to 50°C	
Features	810BR100.000-1	810BR060.000-1	810BR028.000-1
Resistance value at 20°C	100 Ω	60 Ω	28 Ω
Average available power at 50°C	0.05 kW ¹⁾	0.1 kW ¹⁾	0.2 kW ¹⁾
Thermal protection	Using temperature-controlled switches or the inverter		
Temperature controlled switch			
Activation temperature		120°C	
Max. voltage / Max. current		250 VAC / 1 A	
Min. voltage / Min. current		24 VDC / 0.1 A	
Max. contact resistance		60 mΩ	
Connection recommendation	The switch should be connected within the sequence (so it can be used for signaling or line contactor control)		

¹⁾ Load factors for resistances: The value for the average power that can be transferred from the resistor to the housing at 50°C is aligned to a brake load factor that corresponds to most standard applications.
 For 810BR100.000-1 to 810BR003.000-1:
 - Braking for 2 s with a braking torque of 0.6 Tn for a 40 second cycle
 - Braking for 0.8 s with a braking torque of 1.5 Tn for a 40 second cycle
 For 810BR003.001-1 to 810BR001.004-1:
 - Braking for 10 s with a braking torque of 2 Tn for a 30 second cycle

Dimensions



Installation recommendations



	a	b	c	G	H	Ø
810BR100.000-1	95	293	95	70	275	6x12
810BR060.000-1	95	293	95	70	375	6x12
810BR028.000-1	140	393	120	120	375	6x12

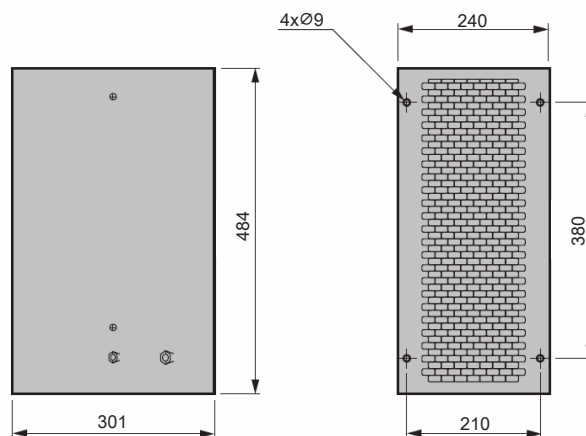
Braking resistors for ACOPOSinverter P84

810BR015.000-1, 810BR010.000-1, 810BR008.000-1

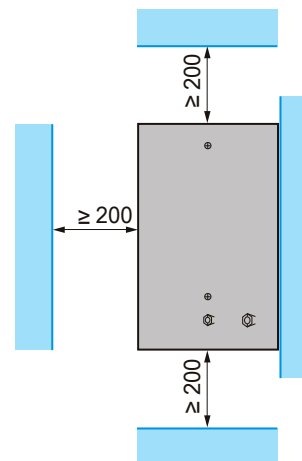
Operating conditions	810BR015.000-1	810BR010.000-1	810BR008.000-1
Rated protection of housing			IP20
Ambient temperature			0 to 50°C
Features	810BR015.000-1	810BR010.000-1	810BR008.000-1
Resistance value at 20°C	15 Ω	10 Ω	8 Ω
Average available power at 50°C			1 kW ¹⁾
Thermal protection	Using temperature-controlled switch or the inverter		
Temperature controlled switch			
Activation temperature			120°C
Max. voltage / Max. current			250 VAC / 1 A
Min. voltage / Min. current			24 VDC / 0.1 A
Max. contact resistance			60 mΩ
Connection recommendation	The switch should be connected within the sequence (for use in signaling or line contactor control)		

¹⁾ Load factors for resistances: The value for the average power that can be transferred from the resistor to the housing at 50°C is aligned to a brake load factor that corresponds to most standard applications.
 For 810BR100.000-1 to 810BR003.000-1:
 - Braking for 2 s with a braking torque of 0.6 Tn for a 40 second cycle
 - Braking for 0.8 s with a braking torque of 1.5 Tn for a 40 second cycle
 For 810BR003.001-1 to 810BR001.004-1:
 - Braking for 10 s with a braking torque of 2 Tn for a 30 second cycle

Dimensions



Installation recommendations

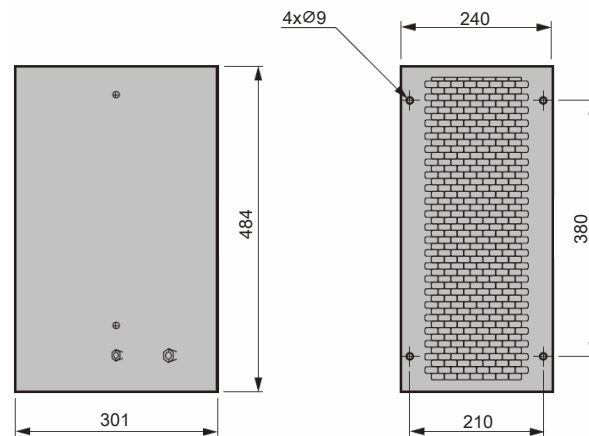


810BR005.000-1, 810BR004.000-1, 810BR003.000-1

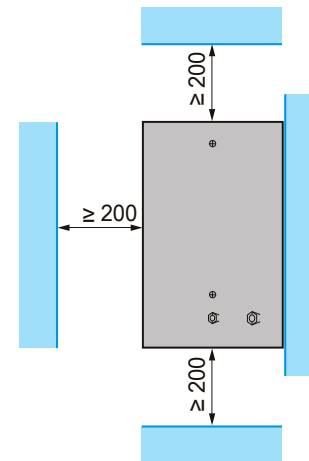
Operating conditions	810BR005.000-1	810BR004.000-1	810BR003.000-1
Rated protection of housing		IP20	
Ambient temperature		0 to 50°C	
Features	810BR005.000-1	810BR004.000-1	810BR003.000-1
Resistance value at 20°C	5 Ω	4 Ω	2.5 Ω
Average available power at 50°C	1.3 kW ¹⁾	1 kW ¹⁾	1 kW ¹⁾
Thermal protection	Using temperature-controlled switch or the inverter		
Temperature controlled switch			
Activation temperature		120°C	
Max. voltage / Max. current		250 VAC / 1 A	
Min. voltage / Min. current		24 VDC / 0.1 A	
Max. contact resistance		60 mΩ	
Connection recommendation	The switch should be connected within the sequence (for use in signaling or line contactor control)		

¹⁾ Load factors for resistances: The value for the average power that can be transferred from the resistor to the housing at 50°C is aligned to a brake load factor that corresponds to most standard applications.
 For 810BR100.000-1 to 810BR003.000-1:
 - Braking for 2 s with a braking torque of 0.6 Tn for a 40 second cycle
 - Braking for 0.8 s with a braking torque of 1.5 Tn for a 40 second cycle
 For 810BR003.001-1 to 810BR001.004-1:
 - Braking for 10 s with a braking torque of 2 Tn for a 30 second cycle

Dimensions

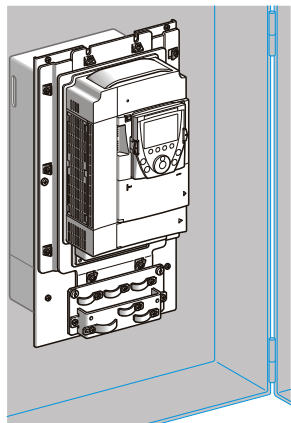


Installation recommendations



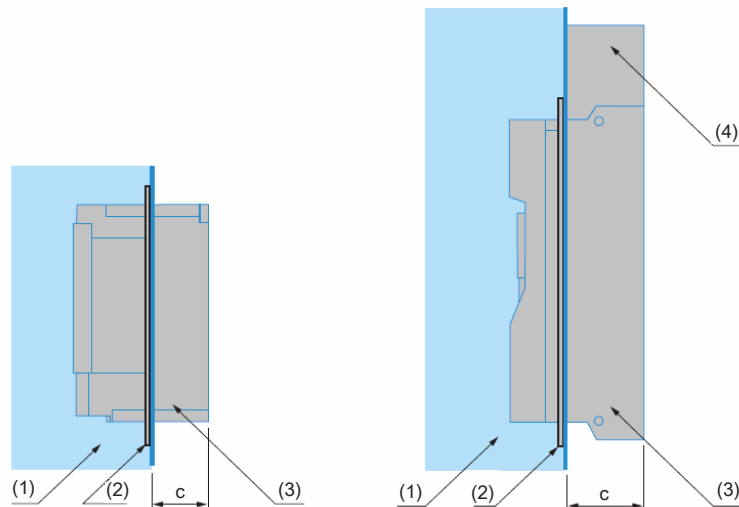
Feed-through mounting kits for ACOPOSinverter P84

Feed-through mounting kits for ACOPOSinverter P84



Model number	For ACOPOSinverter P84	c
810MF001.300-1	8184T200037.01P-1, 8184T200075.01P-1, 8184T200150.01P-1, 8184T400075.01P-1, 8184T400150.01P-1, 8184T400220.01P-1	60 mm
810MF002.300-1	8184T200220.01P-1, 8184T200300.01P-1, 8184T200400.01P-1, 8184T400300.01P-1, 8184T400400.01P-1	70 mm
810MF003.300-1	8184T200550.01P-1, 8184T400550.01P-1, 8184T400750.01P-1	70 mm
810MF004.300-1	8184T200750.01P-1, 8184T401100.01P-1	90 mm
810MF005.300-1	8184T201100.01P-1, 8184T201500.01P-1, 8184T401500.01P-1, 8184T401850.01P-1	90 mm
810MF006.300-1	8184T201850.01P-1, 8184T202200.01P-1, 8184T402200.01P-1	105 mm
810MF007.300-1	8184T403000.01P-1, 8184T403700.01P-1	105 mm
810MF008.300-1	8184T203000.01P-1, 8184T203700.01P-1, 8184T204500.01P-1	105 mm
810MF009.300-1	8184T404500.01P-1, 8184T405500.01P-1, 8184T407500.01P-1	105 mm

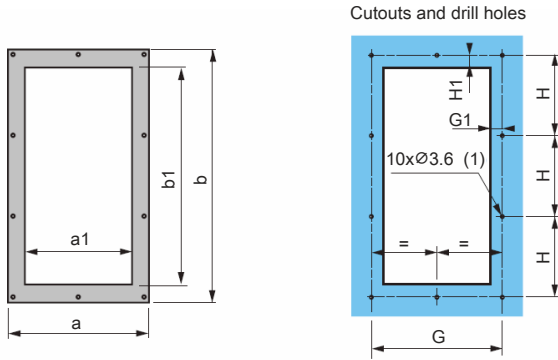
Side view:



- Kits for feed-through mounting of an ACOPOSinverter P84 in a housing protected against dust and moisture
- These kits can be used to mount the inverter power unit outside the housing (IP54 protection), which reduces the amount of energy dissipated inside the control cabinet.
- With this type of installation, the maximum temperature inside the housing can reach 60°C without having to reduce the output current. From 50 to 60°C, a control card fan kit must be used for the following ACOPOSinverter P84 devices: 3x 200 to 240 V, 18.5 to 45 kW and 3x 380 to 480 V, 22 to 75 kW.

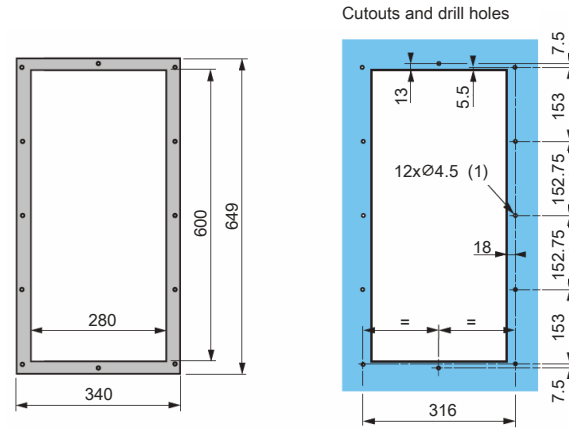
- (1) Housing protected against dust and moisture
- (2) Kit for feed-through mounting in a housing protected against dust and moisture
- (3) Inverter power element outside the housing
- (4) DC bus choke for ACOPOSinverter P84 from 90 kW to 280 kW

Dimensions



(1) Drill hole \varnothing 3.6 for self-tapping M4 screws

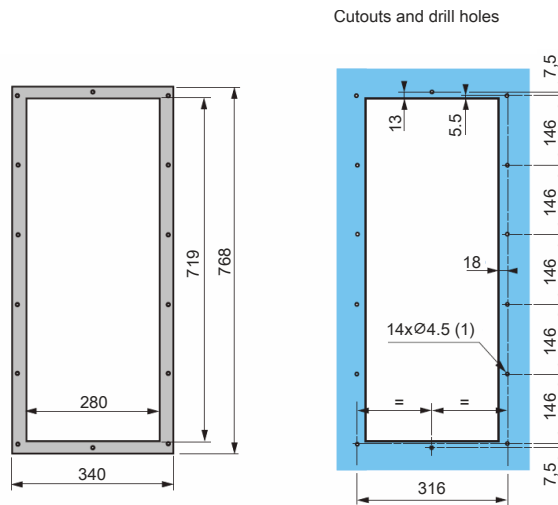
810MF006.300-1



(1) Drill hole \varnothing 4.5 for self-tapping M5 screws

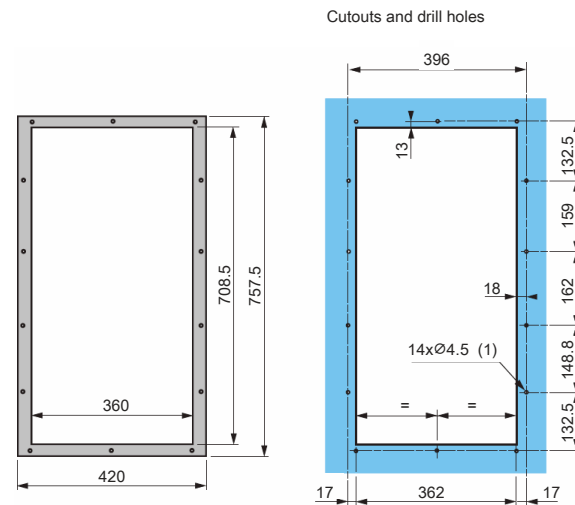
	a	a1	b	b1	G	G1	H	H1
810MF001.300-1	222	170	397	351	205	17.5	127	15
810MF002.300-1	250	198	429.5	384.5	233	17.5	137.5	14
810MF003.300-1	267	215	465	419	250	17.5	149.5	14.5
810MF004.300-1	302	250	481.5	438	285	17.5	155	13
810MF005.300-1	324.5	270	584.5	537.5	305	17.5	189.5	15.5

810MF007.300-1



(1) Drill hole \varnothing 4.5 for self-tapping M5 screws

810MF008.300-1

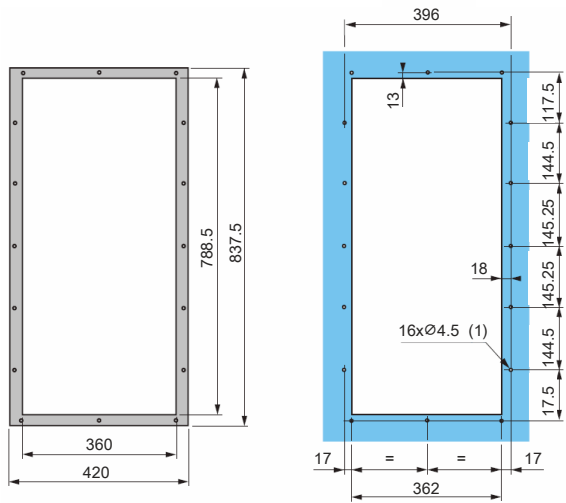


(1) Drill hole \varnothing 4.5 for self-tapping M5 screws

Feed-through mounting kits for ACOPOSinverter P84

810MF009.300-1

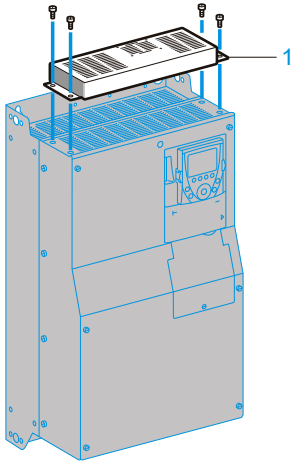
Cutouts and drill holes



(1) Drill hole \varnothing 4.5 for self-tapping M5 screws

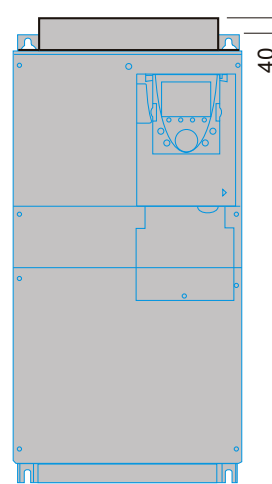
Control card fan kit for ACOPOSinverter P84 - 8I0XF

Control card fan kit for ACOPOSinverter P84 - 8I0XF

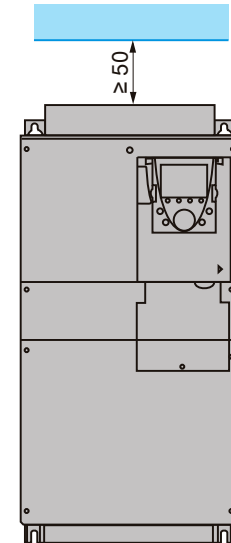


- These kits are required for ACOPOSinverter P84 devices with 3x 200 to 240 V, 18.5 to 45 kW and 3x 380 to 480 V, 22 to 75 kW for operation at an ambient temperature of 50 to 60°C.

Model number	For ACOPOSinverter P84
8I0XF004.300-1	8I84T201850.01P-1, 8I84T202200.01P-1, 8I84T402200.01P-1
8I0XF005.300-1	8I84T403000.01P-1, 8I84T403700.01P-1
8I0XF006.300-1	8I84T203000.01P-1, 8I84T203700.01P-1, 8I84T204500.01P-1
8I0XF007.300-1	8I84T404500.01P-1, 8I84T405500.01P-1, 8I84T407500.01P-1



Installation recommendations



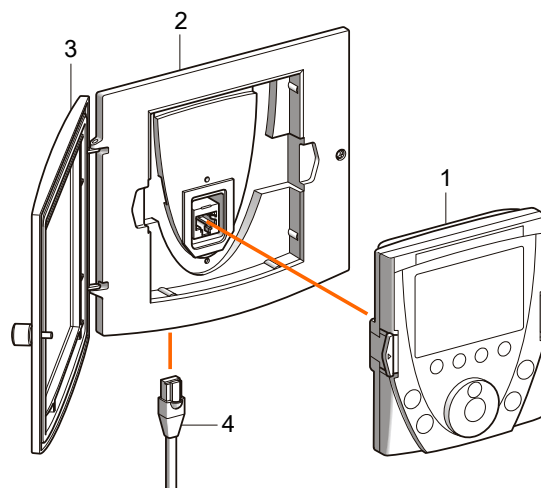
Graphics displays for ACOPOSinverter P74 and P84

Graphics displays for ACOPOSinverter P74 and P84



- The optional graphic display can be installed on the front side of the ACOPOSinverter.
- It allows the following:
 - Controlling, aligning and configuring the inverter
 - Displaying current values (motor, I/O, etc.)
 - Saving and downloading configurations (4 configuration files can be saved)
- The following accessories are available:
 - A remote mounting kit for mounting in the door of a control cabinet with IP54 protection
 - A transparent cover that can be fastened to the remote mounting mechanism for IP65 protection
 - A cable for connecting the graphics display to the ACOPOSinverter device
 - An RJ45 adapter for connecting the graphics display to the remote cable

Model number	For ACOPOSinverter P84
810XD301.300-1 (1)	Graphics display 8 lines, 240 x 160 pixels Assignable function keys F1, F2, F3, F4 "STOP/RESET" key: Local control of STOP/RESET if motor error occurs "RUN" key: Local control of START "FWD/REV" key: Changes the direction of rotation of the motor Navigation key and "ESC" key for navigating in the inverter's menu IP54 protection
810XD302.300-1 (2)	Remote installation kit IP54 protection
810XD303.300-1 (3)	Front cover IP65 protection
810XD304.301-1 (4)	Cable 1 m
810XD304.303-1 (4)	Cable 3 m
810XD304.305-1 (4)	Cable 5 m
810XD304.310-1 (4)	Cable 10 m
810XD305.300-1 (5)	RJ45 adapter



Incremental encoder interfaces for ACOPOSInverter P84

Incremental encoder interfaces for ACOPOSInverter P84



- Encoder interface boards are used to handle flux vector control with an encoder (FVC mode) for induction motors. This improves the drive performance regardless of the motor load status:
 - Torque at standstill (0 rpm)
 - Precise speed control
 - Exact torque
 - Shorter response times for sudden increases in torque
 - Improved dynamic performance.
- For induction motors, encoder interface boards used in the other control modes (voltage vector control, voltage/frequency ratio - V/f characteristic curve) can improve the static speed precision.
- Three board types are available depending on the encoder technology:
 - RS422-compatible differential outputs
 - Open collector outputs (NPN)
 - Push-pull outputs
- Regardless of the control type, the encoder interface card provides extra safety for the machine:
 - Measures overspeed
 - Measures motor pull-out

Model number	For ACOPOSInverter P84
810AC123.300-1	Incremental encoder interface for RS422 signals (TTL), 5 V supply voltage
810AC123.301-1	Incremental encoder interface for RS422 signals (TTL), 15 V supply voltage
810AC123.302-1	Incremental encoder interface for open collector, 12 V supply voltage
810AC123.303-1	Incremental encoder interface for open collector, 15 V supply voltage
810AC123.304-1	Incremental encoder interface for push-pull HTL, 12 V supply voltage
810AC123.305-1	Incremental encoder interface for push-pull HTL, 15 V supply voltage
810AC123.306-1	Incremental encoder interface for push-pull HTL, 24 V supply voltage

Incremental encoder interfaces for ACOPOSinverter P84

8I0AC123.300-1, 8I0AC123.301-1, 8I0AC123.302-1, 8I0AC123.303-1

Encoder supply	8I0AC123.300-1	8I0AC123.301-1	8I0AC123.302-1	8I0AC123.303-1
Short circuit protection, overload protection	Yes			
Supply voltages	5 VDC (min. 5 V, max. 5.5 V)	15 VDC (min. 15 V, max. 16 V)	12 VDC (min. 12 V, max. 13 V)	15 VDC (min. 15 V, max. 16 V)
Max. current	200 mA	175 mA	175 mA	175 mA
Incremental encoder	8I0AC123.300-1	8I0AC123.301-1	8I0AC123.302-1	8I0AC123.303-1
Max. input frequency	300 kHz			
Input signals	A, A\, B, B\	A, A\, B, B\	A, A\, B, B\ / AB / A	A, A\, B, B\ / AB / A
Input signals Impedance	440 Ω	440 Ω	1 Ω	1 Ω
Number of pulses per encoder rotation	Max. 5000			
Encoder input	8I0AC123.300-1	8I0AC123.301-1	8I0AC123.302-1	8I0AC123.303-1
Connection	Terminal block			
Max. encoder cable length	50 m	100 m	500 m	500 m
General information	8I0AC123.300-1	8I0AC123.301-1	8I0AC123.302-1	8I0AC123.303-1
Encoder type	Encoder interface cards with RS422-compatible differential outputs	Encoder interface cards with RS422-compatible differential outputs	Encoder interface card with open collector outputs	Encoder interface card with open collector outputs
Module type	ACOPOSinverter plug-in module			

8I0AC123.304-1, 8I0AC123.305-1, 8I0AC123.306-1

Encoder supply	8I0AC123.304-1	8I0AC123.305-1	8I0AC123.306-1
Short circuit protection, overload protection		Yes	
Supply voltages	12 VDC (min. 12 V, max. 13 V)	15 VDC (min. 15 V, max. 16 V)	24 VDC (min. 20 V, max. 30 V)
Max. current		175 mA	
Incremental encoder	8I0AC123.304-1	8I0AC123.305-1	8I0AC123.306-1
Max. input frequency		300 kHz	
Input signals		A, A\, B, B\ / AB / A	
Input signals			
Impedance	1 Ω	1 Ω	1.6 Ω
State 0		<1.5 V	
State 1	>7.7 V and <13 V	>7.7 V and <16 V	>11.5 V and <25 V
Number of pulses per encoder rotation		Max. 5000	
Encoder input	8I0AC123.304-1	8I0AC123.305-1	8I0AC123.306-1
Connection		Terminal block	
Max. encoder cable length		500 m	
General information	8I0AC123.304-1	8I0AC123.305-1	8I0AC123.306-1
Encoder type		Encoder interface card with push-pull outputs	
Module type		ACOPOSinverter plug-in module	

ACOPOSinverter P74 - Additional accessories

810XC001.003-1



Short description

Accessories

ACOPOSinverter USB Modbus universal cable 3 m
PC - ACOPOSinverter connection






Automation software

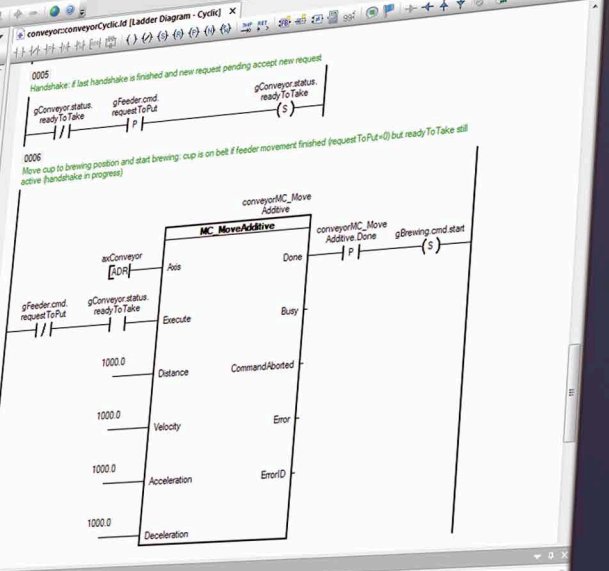
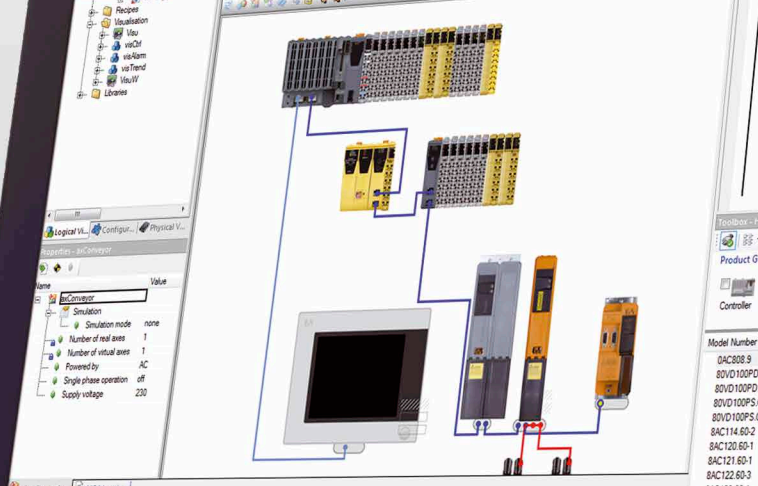
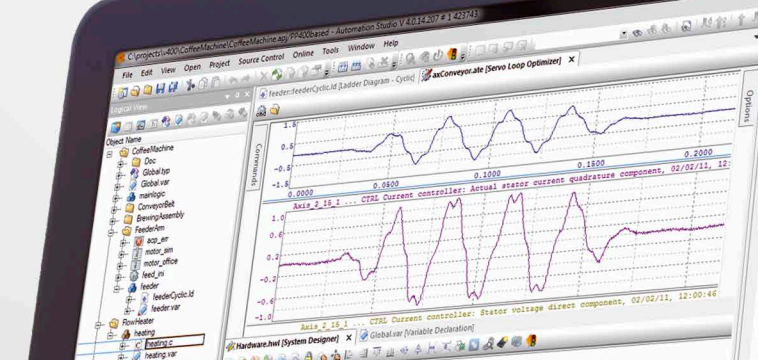
Integrated software engineering

A single uniform programming tool for every aspect of an automation project minimizes training needs, solidifies overall integration and eliminates communication problems between engineering disciplines. Automation Studio 4 is the ultimate development and runtime environment for every aspect of an automation solution – from control and motion technology to HMI, operation and integrated safety technology. The versatility provided by several different programming languages, ready-to-use software technology functions, the flexible ARNC0 CNC system and the virtual wiring of functional safety technology in SafeDESIGNER are just a few of its many strengths.

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Toolbox - Hardware Catalog (in Conveyor)

Product Group: Accessory

Model Number	Description
8AC808-9	SPort industrial hub
80VD100PD-C000-01	ACOPOSmicro Servo, 2x 8 A, 2x EnDat
80VD100PD-C022-01	ACOPOSmicro Servo, 2x 8 A, 2x Resolver
80VD100PS-C020X-01	ACOPOSmicro Servo, 1x 8 A, 1x EnDat
80VD100PS-C02XV-01	ACOPOSmicro Servo, 1x 8 A, 1x Resolver
8AC114-60-2	ACOPOS plug-in module, POWERLINK V2 interface
8AC120-60-1	ACOPOS plug-in module, EnDat encoder and sine incremental encoder interface
8AC121-60-1	ACOPOS plug-in module, HIPERFACE interface
8AC122-60-3	ACOPOS plug-in module, resolver interface 10 kHz
8AC123-60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface
8AC17K-60-1	APTRYS nLine module, BiSS encoder interface RV

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Automation Studio 4.2

Automation Studio 4.2 for single workstation

Model number	Short description
1A4300.L1DE-402	B&R Automation Studio 4.2 for 1 workstation, German and English AS version, German packaging, includes SafeDESIGNER and 1-year upgrade service agreement 1A4300.U1DE-4XX at no extra charge, volume discount over 5 pcs.
1A4300.U1DE-4XX	B&R Automation Studio upgrade service agreement for 1 workstation, German packaging, includes the latest AS 4.x DVD, volume discount over 5 pcs.
1A4300.L1EN-402	B&R Automation Studio 4.2 for 1 workstation, German and English AS version, English packaging, includes SafeDESIGNER and 1-year upgrade service agreement 1A4300.U1EN-4XX at no extra charge, volume discount over 5 pcs.
1A4300.U1EN-4XX	B&R Automation Studio upgrade service agreement for 1 workstation, English packaging, includes the latest AS 4.x DVD, volume discount over 5 pcs.

Automation Studio 4.2 for single site

Model number	Short description
1A4300.LSDE-402	B&R Automation Studio 4.2, single site, for use at one company location, German and English AS version, German packaging, includes SafeDESIGNER and 1-year upgrade service agreement 1A4300.USDE-4XX at no extra charge
1A4300.USDE-4XX	B&R Automation Studio upgrade service agreement for single site, German packaging, includes the latest AS 4.x DVD
1A4300.LSEN-402	B&R Automation Studio 4.2, single site, for use at one company location, German and English AS version, English packaging, includes SafeDESIGNER and 1-year upgrade service agreement 1A4300.USEN-4XX at no extra charge
1A4300.USEN-4XX	B&R Automation Studio upgrade service agreement for single site, English packaging, includes the latest AS 4.x DVD

Automation Studio 4.2 unlimited

Model number	Short description
1A4300.LUDE-402	B&R Automation Studio 4.2 unlimited, German and English AS version, German packaging, includes SafeDESIGNER and 1-year upgrade service agreement 1A4300.UUDE-4XX at no extra charge
1A4300.UUDE-4XX	B&R Automation Studio upgrade service agreement unlimited, German packaging, includes the latest AS 4.x DVD
1A4300.LUEN-402	B&R Automation Studio 4.2 unlimited, German and English AS version, English packaging, includes SafeDESIGNER and 1-year upgrade service agreement 1A4300.UUEN-4XX at no extra charge
1A4300.UUEN-4XX	B&R Automation Studio upgrade service agreement unlimited, English packaging, includes the latest AS 4.x DVD

Automation Studio 4.2 maintenance version

Model number	Short description
1A4300.LMDE-402	B&R Automation Studio 4.2 maintenance version for 1 workstation, German and English AS version, German packaging, includes the latest AS 4.2 DVD
1A4300.LMEN-402	B&R Automation Studio 4.2 maintenance version for 1 workstation, German and English AS version, English packaging, includes the latest AS 4.2 DVD

01 Communication

- All devices networked via POWERLINK to form a complete, synchronous system
- Simple, controlled access to machine data with OPC-UA
- Seamless integration of fieldbus devices
- External databases linked directly to the machine

02 Project management

- Investment protection through software reusability
- Complete integration of all B&R products yet also open to those from other manufacturers
- Source control system for assured access to defined development versions

03 Programming

- Compatibility with IEC 61131-3 languages, CFC and ANSI C
- Object-oriented programming in C++
- Extensive technology libraries
- Integration of code from third-party applications
- Access to all PLCopen function blocks

04 Diagnostics & Remote maintenance

- Comprehensive and integrated diagnostic functions
- Graphical analysis of machine states
- Web-based diagnostics with the System Diagnostics Manager

05 Drives & Motion control

- Uniform programming – from stepper motors to servo drives
- Easy access with standardized PLCopen integration
- Comprehensive support from configuration to commissioning
- One homogeneous system from single-axis to CNC and robotics applications

06 Safety

- Uniform view of safe I/O data in the standard and safe application
- No impact of functional changes on the safe application
- Safety during programming through the use of certified PLCopen function blocks
- Fieldbus-independent safety technology with openSAFETY

07 Operation & Monitoring

- Integrated machine visualization – from small displays to entire SCADA packages
- Machine visualization on a controller – local, remote or virtual
- Multilingual applications using Unicode

08 Control

- Complete integration of control, HMI, motion and safety technology
- Software compatibility across all hardware platforms
- Dynamic updating of plant components
- Decentralized hardware, local data management

Automation Studio 4.2

With Automation Studio, developers can program, test and optimize open and closed control loops and algorithms, movement sequences and visualization interfaces, safety and redundancy solutions – all in a single development environment. This eliminates the problems that arise when interfacing between separate tools and significantly increases development efficiency. Through the use of open communication and software

architectures and the application of advanced, sustainable development techniques, this integrated development platform and real-time operating system supports time-saving development of high-quality complete solutions from start to finish. Eliminate barriers between systems and tap into the full potential of reusable software components with Automation Studio 4.



Software technology functions

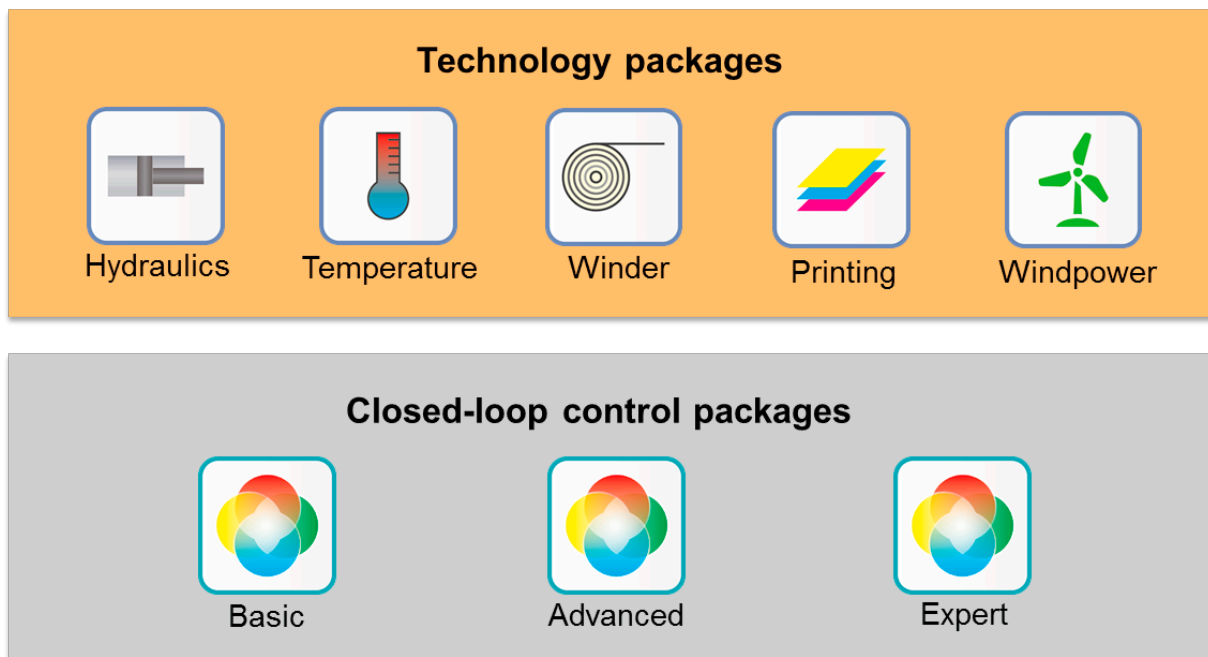
Quality through integrated control technology

Integrated control technology refers to nothing less than the implementation of perfectly tuned open and closed control loops on the basis of a homogeneous and synchronous hardware system. This includes being able to simulate both the machine as well as the control loops in order to achieve the best possible results down the line.

Scalable product structure

An essential part of developing this type of optimized control solution is the software. B&R offers a wide range of preprogrammed function blocks for mechatronic control tasks common (and not so common) to the field of industrial automation. The modular structure of these blocks makes it easy to find just the right level of functionality to manage the task at hand. From individual all-in-one solutions to advanced technology functions that have proven themselves across industries, there's virtually no situation that these blocks can't handle.

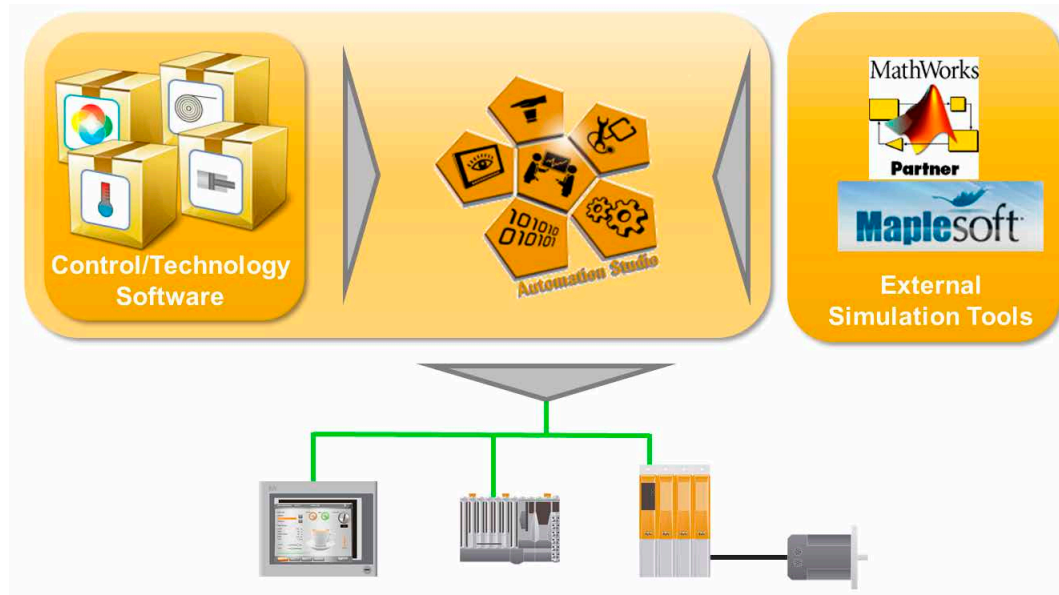
Product overview



Software technology functions

Simulation and automation

Simulation has become a decisive component of closed-loop control, contributing to a much deeper understanding of the process and making it possible to master even the most complex tasks. With "Automation Studio Target for Simulink" and an import mechanism for functional mock-up units (FMUs), the world of automation is linked to the MATLAB/Simulink and MapleSim simulation environments, bringing the mechatronic development process in Automation Studio full circle.



Closed-loop control packages



Basic functionality

- Basic closed-loop control blocks
- Signal filtering
- Profile generation
- Statistical functions
- Lookup tables

Model number	Name	Short description
Included with AS at no extra charge	Basic Controller Design	Technology libraries for general closed-loop control tasks



Advanced functionality

- Signal processing
- System identification
- Linear algebra
- Model-based closed-loop controller tuning methods

Model number	Name	Short description
1TG7110.M	MTAdvanced	Technology library for model-based closed-loop controller design
1TG7111.M	MTIdent	Technology library for process identification



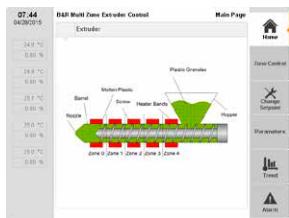
Expert functionality

- Model predictive control for SISO and MIMO systems

Model number	Name	Short description
1TG7130.M	MTMpcSiso	Technology library for model predictive control for SISO systems (single-input single-output)
1TG7131.M	MTMpcMimo	Technology library for model predictive control for MIMO systems (multi-input multi-output)

Software technology functions

Technology packages



Temperature control

- Fully automated time-optimized controller setting
- Use with heating and cooling processes
- Multi-zone control possible
- Closed-loop control with minimum overshoot
- PWM signal generation with load balancing functionality
- Setprofile generator for temperature
- Simulation model

Model number	Name	Short description
1TG7210.M	MTTemp	Technology library for closed-loop temperature control tasks



Winder control

- Open- and closed-loop tension control
- Regulation of dancer position
- Diameter estimation
- Inertia compensation
- Automatic adjustment of control parameters
- Taper tension functionality

Model number	Name	Short description
1TG7410.M	MTWinder	Technology library for closed-loop control of winding and unwinding processes



Register control

- Automatic adjustment of control parameters
- Key and sequential color control
- Independent of print substrate
- Acceleration compensation
- Integrated simulation model of gravure printing machinery

Model number	Name	Short description
1TG7450.1	MTRegister	Technology library for controlling longitudinal register errors in gravure printing machinery



Closed-loop tension control

- Multi-zone tension control for continuous web machines
- Automatic adjustment of control parameters
- Acceleration compensation
- Integrated simulation model of a 5-zone production system

Model number	Name	Short description
1TG7430.M	MTTension	Technology library for multi-zone tension control for continuous web machines



Closed-loop hydraulic control for valve-based drives

- Position controllers, speed controllers and force/pressure controllers or alternating control loops
- Servo correction for the valve, cylinder surface adjustment, inclusion of dynamic pressure build-up
- Preprogrammed technology solutions for typical applications
- Integrated simulation model of a hydraulic axis

Model number	Name	Short description
1TG7310.M	MTHydValve	Technology library for closed-loop control of valve-based hydraulic drives

Hydraulic control for servo pump drives

- Alternating speed/pressure control
- Overlapping position control
- Protection for ACOPOS servo drives and servo pumps
- Determination of the electrical, hydraulic and mechanical power of the power transmission system
- Fast switching between different control parameter sets at runtime
- Integrated simulation model of a hydraulic axis

Model number	Name	Short description
1TG7350.M	MTHydPump	Technology library for closed-loop control of electrohydraulic servo pump drives
1A7399.1	Servo Pump Sizing Tool	Dimensioning software for sizing servo drives, motors and hydraulic pumps

Simulation and automation



Automation Studio Target for Simulink

- Generation of ANSI C and C++ code from Simulink
- Easy to use
- Seamless integration in Automation Studio
- Automatic compilation and download from Simulink
- External mode (rapid prototyping in Simulink)
- MathWorks Connections Program product

Model number	Name	Short description
1A43TS.L1	Automation Studio Target for Simulink	Automation Studio interface package for generating code automatically from Simulink

Generic Motion Control

Basic CNC/robotics functions, up to four axes per channel

Model number	Short description
1TG8CNC0000.00-01	<p>Path control for one CNC or robotic channel with up to four axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Permit-free export version</p>
1TG8CNC0000.00-02	<p>Path control for two CNC or robotic channels with up to four axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Permit-free export version</p>
1TG8CNC0000.00-04	<p>Path control for four CNC or robotic channels with up to four axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Permit-free export version</p>
1TG8CNC0000.00-08	<p>Path control for eight CNC or robotic channels with up to four axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Permit-free export version</p>
1TG8CNC0000.00-09	<p>Path control for more than eight CNC or robotic channels with up to four axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Permit-free export version</p>

Basic CNC/robotics functions, up to nine axes per channel

Model number	Short description
1TG8CNC0000.01-01	<p>Path control for one CNC or robotic channel with up to nine axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Export approval required, ECCN:2D002</p>
1TG8CNC0000.01-02	<p>Path control for two CNC or robotic channels with up to nine axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Export approval required, ECCN:2D002</p>
1TG8CNC0000.01-04	<p>Path control for four CNC or robotic channels with up to nine axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Export approval required, ECCN:2D002</p>
1TG8CNC0000.01-08	<p>Path control for eight CNC or robotic channels with up to nine axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Export approval required, ECCN:2D002</p>
1TG8CNC0000.01-09	<p>Path control for more than eight CNC or robotic channels with up to nine axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Export approval required, ECCN:2D002</p>

Multi-axis CNC/robotics functions, more than nine axes per channel

Model number	Short description
1TG8CNCA00.01-01	<p>Path control for one CNC or robotic channel with more than nine axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Export approval required, ECCN:2D002</p>
1TG8CNCA00.01-02	<p>Path control for two CNC or robotic channels with more than nine axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Export approval required, ECCN:2D002</p>
1TG8CNCA00.01-04	<p>Path control for four CNC or robotic channels with more than nine axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Export approval required, ECCN:2D002</p>
1TG8CNCA00.01-08	<p>Path control for eight CNC or robotic channels with more than nine axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Export approval required, ECCN:2D002</p>
1TG8CNCA00.01-09	<p>Path control for more than eight CNC or robotic channels with more than nine axes.</p> <p>Configurable syntax interpreter for CNC programs in accordance with DIN/ISO 66025 as well as robotics programs based on ST, macros, subroutines, step-by-step processing, etc.</p> <p>Various interpolation types (point-to-point, rapid, linear, circular, spline, etc.), tool data correction, workspace monitoring, automatic tangential axes handling, dynamic look-ahead for movement profiles with optimal contour precision, restart functions.</p> <p>Export approval required, ECCN:2D002</p>

Basic 3D CNC/robotics functions

Basic 3D functions for kinematic structures with up to 4 joints, e.g. SCARA, 2D rod kinematics, tripods, etc., permit-free export version

Model number	Short description
1TG8TRF0000.01-01	3D transformation functions for one kinematic structure with up to four joint axes, such as SCARA, double SCARA, 2D rod kinematics, tripods, etc. Interface support for application-specific transformations. Basic CNC/robotics functions: 1TG8CNC0000.00-xx (Permit-free export version)
1TG8TRF0000.01-02	3D transformation functions for two kinematic structures with up to four joint axes, such as SCARA, double SCARA, 2D rod kinematics, tripods, etc. Interface support for application-specific transformations. Basic CNC/robotics functions: 1TG8CNC0000.00-xx (Permit-free export version)
1TG8TRF0000.01-04	3D transformation functions for four kinematic structures with up to four joint axes, such as SCARA, double SCARA, 2D rod kinematics, tripods, etc. Interface support for application-specific transformations. Basic CNC/robotics functions: 1TG8CNC0000.00-xx (Permit-free export version)
1TG8TRF0000.01-08	3D transformation functions for eight kinematic structures with up to four joint axes, such as SCARA, double SCARA, 2D rod kinematics, tripods, etc. Interface support for application-specific transformations. Basic CNC/robotics functions: 1TG8CNC0000.00-xx (Permit-free export version)
1TG8TRF0000.01-09	3D transformation functions for more than eight kinematic structures with up to four joint axes, such as SCARA, double SCARA, 2D rod kinematics, tripods, etc. Interface support for application-specific transformations. Basic CNC/robotics functions: 1TG8CNC0000.00-xx (Permit-free export version)

Standard 3D CNC/robotics functions

Standard 3D functions for kinematic structures with more than 4 joints, e.g. 6-axis articulated arm, 5-axis CNC, etc. export approval required, ECCN:2D002

Model number	Short description
1TG8TRF0000.02-01	3D transformation functions for one kinematic structure with more than four joint axes, such as, for example, 6-axis articulated arm robots, 5-axis CNC, etc. Multi-axis CNC/robotics functions: 1TG8CNAX00.01-xx (Export approval required, ECCN:2D002)
1TG8TRF0000.02-02	3D transformation functions for two kinematic structures with more than four joint axes, such as, for example, 6-axis articulated arm robots, 5-axis CNC, etc. Multi-axis CNC/robotics functions: 1TG8CNAX00.01-xx (Export approval required, ECCN:2D002)
1TG8TRF0000.02-04	3D transformation functions for four kinematic structures with more than four joint axes, such as, for example, 6-axis articulated arm robots, 5-axis CNC, etc. Multi-axis CNC/robotics functions: 1TG8CNAX00.01-xx (Export approval required, ECCN:2D002)
1TG8TRF0000.02-08	3D transformation functions for eight kinematic structures with more than four joint axes, such as, for example, 6-axis articulated arm robots, 5-axis CNC, etc. Multi-axis CNC/robotics functions: 1TG8CNAX00.01-xx (Export approval required, ECCN:2D002)
1TG8TRF0000.02-09	3D transformation functions for more than eight kinematic structures with more than four joint axes, such as, for example, 6-axis articulated arm robots, 5-axis CNC, etc. Multi-axis CNC/robotics functions: 1TG8CNAX00.01-xx (Export approval required, ECCN:2D002)

SDC (Smart Device Controller) Closed Loop

Model number	Short description
1TG8SDC0000.01-01	SDC (Smart Device Controller) Closed Loop for one independent positioning axis. Closed loop servo mode for stepper motor modules and motor modules, frequency inverters and servos from third-party providers.
1TG8SDC0000.01-02	SDC (Smart Device Controller) Closed Loop for two independent positioning axes. Closed loop servo mode for stepper motor modules and motor modules, frequency inverters and servos from third-party providers.
1TG8SDC0000.01-04	SDC (Smart Device Controller) Closed Loop for four independent positioning axes. Closed loop servo mode for stepper motor modules and motor modules, frequency inverters and servos from third-party providers.
1TG8SDC0000.01-08	SDC (Smart Device Controller) Closed Loop for eight independent positioning axes. Closed loop servo mode for stepper motor modules and motor modules, frequency inverters and servos from third-party providers.
1TG8SDC0000.01-09	SDC (Smart Device Controller) Closed Loop for more than eight independent positioning axes. Closed loop servo mode for stepper motor modules and motor modules, frequency inverters and servos from third-party providers.

Generic Motion Control

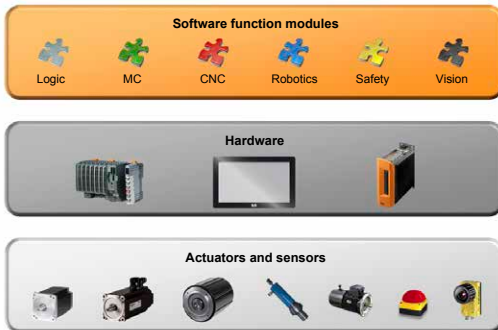
SDC (Smart Device Controller) Advanced

Model number	Short description
1TG8SDC0000.02-01	SDC (Smart Device Controller) Advanced for one independent positioning axis. Electronic gears, cam profiles, Cam Profile Automat and ACOPOS reACTION technology.
1TG8SDC0000.02-02	SDC (Smart Device Controller) Advanced for two independent positioning axes. Electronic gears, cam profiles, Cam Profile Automat and ACOPOS reACTION technology.
1TG8SDC0000.02-04	SDC (Smart Device Controller) Advanced for four independent positioning axes. Electronic gears, cam profiles, Cam Profile Automat and ACOPOS reACTION technology.
1TG8SDC0000.02-08	SDC (Smart Device Controller) Advanced for eight independent positioning axes. Electronic gears, cam profiles, Cam Profile Automat and ACOPOS reACTION technology.
1TG8SDC0000.02-09	SDC (Smart Device Controller) Advanced for more than eight independent positioning axes. Electronic gears, cam profiles, Cam Profile Automat and ACOPOS reACTION technology.

SDC (Smart Device Controller) Premium

Model number	Short description
1TG8SDC0000.03-01	SDC (Smart Device Controller) Premium for one independent positioning axis. Cycle time less than 800 μ s.
1TG8SDC0000.03-02	SDC (Smart Device Controller) Premium for two independent positioning axes. Cycle time less than 800 μ s.
1TG8SDC0000.03-04	SDC (Smart Device Controller) Premium for four independent positioning axes. Cycle time less than 800 μ s.
1TG8SDC0000.03-08	SDC (Smart Device Controller) Premium for eight independent positioning axes. Cycle time less than 800 μ s.
1TG8SDC0000.03-09	SDC (Smart Device Controller) Premium for more than eight independent positioning axes. Cycle time less than 800 μ s.

Generic Motion Control



Generic Motion Control - GMC

Developing machine concepts in today's world goes far and beyond the simple lining up of individual processes to be executed one after the other.

Machines often have to be able to handle direct and simultaneous connections between path control systems and I/O as well as intervening actions in drive functions that derive from the process itself. Auxiliary axes need to be coupled to path axes, and it must be possible to display all sequences in real time. That machines must be networked to accomplish all of this as well as for remote intervention and diagnostics goes without saying.

At B&R, our controller architecture takes these customer demands extremely seriously. Controller programs, I/O processing, visualization and GMC run synchronously on a deterministic real-time system.

With Generic Motion Control, we combine the worlds of robotics, CNC, linked axis movements and single axis positioning into a single homogeneous system. This allows complex path information for robots to also be applied to machine tools and production machines. The control of articulated arm robots is also possible, as is intricate 3D CNC processing.

Standard CNC package

The standard CNC package includes both the hardware components and software functions needed to operate a typical CNC machine.

The hardware includes a 15" CNC panel with keyboard and integrated keys for machine operation, plus a handheld device with a handwheel.

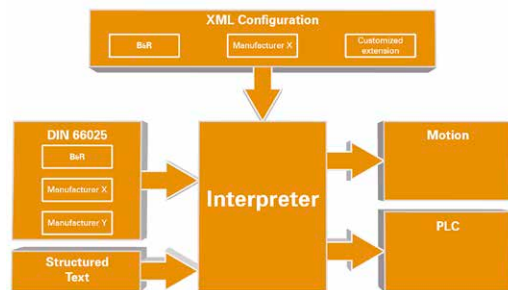
The software contains all of the most important basic functions for operating, configuring and diagnosing the entire system, in particular all axes and CNC channels.

The HMI application is based on Visual Components, B&R's integrated real-time visualization system. Through this application, the user has access to the system functions of the software, with the interface designed in such a way that the visualization component itself can be complemented with or even totally replaced by customer-specific functions.

Pre-programmed visualization components include both "classic" components, e.g. for setting parameters and operating motion programs, as well as tools for simulating, tracing and troubleshooting processes.

On top of all this, the integrated system architecture allows the interpreter to access PLC variables and call system functions and function blocks. Classic sequences are executed on the PLC in real time while path control is being managed simultaneously.





Interpreter

The GMC Interpreter serves as the user interface, with text-based CNC programs and movement sequences for robots implemented in an internal sequential function chart (Advanced Intermediate Language, or AIL), evaluated in successive function modules and finally converted into movements.

CNC applications are programmed in accordance with the DIN 66025 standard, with corresponding expansion possibilities for special functions.

The language definition of the G-code is not integrated in the interpreter as might usually be the case but can be freely defined via XML configuration files. In addition to B&R-specific G-code, the system can also handle dialects from other CNC control manufacturers such as Siemens.

Along with the classic CNC dialects defined in DIN 66025, the interpreter also includes a language definition for Structured Text (ST) with an expansion pack specifically geared towards motion sequences and path definitions for robotics. This makes it possible for traditional robot controllers to handle any conventional programming language.

On top of all this, the integrated system architecture allows the interpreter to access PLC variables and call system functions and function blocks. Classic sequences are executed on the PLC in real time while path control is being managed simultaneously.

Performance advantages

- Ability to understand different NC dialects
- Complete processing sequences programmed in NC code that affect the PLC and NC simultaneously
- Simplified NC programming through the encapsulation of complex functions

Some of the areas that illustrate the full power of the interpreter are listed in the following pages.

Basic functions

General information

- Comments
- Line numbers
- Mathematical and logical operations (+, -, *, /, DIV, MOD, NOT, AND, XOR, OR, etc.)
- Bitwise logical connectives
- Macros
- Subroutines (global, local, with or without transferring parameters)

Control structures

- Loops (Do, While, For)
- Branching (If, Else, Switch)
- Interpreter stop/synchronization commands

CNC-specific language elements

- G-codes
- M-codes
- Tool data correction
- Trigger and latch functions
- etc.

The XML-based language definition allows the user to define any additional statements that are needed.

Advanced functions

The advanced range of functions that the GMC Interpreter can handle underscores the many ways that B&R is able to implement functions for several different technologies.

Variables

Support is provided for simple variables, arrays and structures. When variables are used, they are checked accordingly for validity.

- Local variables
- Variables global to the interpreter
- Variables global to NC
- PLC variables

Depending on the needs of the application, variables can be synchronized either to the interpreter or to the path itself. It is also possible to directly access internal system variables for both axis and CNC system values and states (e.g. positions, path, speed).

Synchronous actions

Independent sequences can be started parallel to the NC program being processed by the interpreter. These sequences are cyclically processed either until an assigned terminating condition or until the end of the NC program.

Functions and function blocks

Functions and function blocks used in the NC program can be provided as a B&R library. Functions and function blocks are both executed synchronously to the interpreter or to the path depending on the configuration.

Multifunctional

Generic CNC and robotics functions

- Functions for all technologies: milling, grinding, cutting, welding, handling, packaging, etc.
- Eight independent channels per system
- Up to 15 axes per channel
- Unrestricted axis assignment to a channel
- Axis replacement
- Dynamic "look ahead" function over any number of path sections
- Optimized motion profiles
- Tool data correction
- Automatic tangential tool guidance
- Reverse movement along the contour
- Freely definable coordinate systems
- Kinematic transformations
- Rotary axis handling

Error compensation

The ability of the controller to compensate for errors is very important for many machines. With this in mind, the system offers integrated compensation functions such as unidirectional and bidirectional spindle pitch error correction and reverse backlash compensation for individual axes.

It is even possible to correct axis skew with respect to an ideal Cartesian coordinate system.

Diagnostics

Recording characteristics such as axis positions and axis speed is an essential part of configuring machines and searching for errors. To handle this, ARNC0 is equipped with an integrated software oscilloscope (trace) that makes it possible to not only read data online, but also to store it in a file for later analysis. A monitor data structure allows the user to display current values on an HMI display.

Restart

CNC programs are sometimes aborted due to machine error or at the request of the user. The soft CNC offers a range of options for restarting a program at the moment it was aborted, or at any other point on the programmed path. This restart data can be stored in a file so that the restart can be carried out whenever needed. Upon restart, the CNC program internally simulates all of the sequences necessary to reach the desired restarting point automatically.

Program simulation

The CNC system's simulation function can also be used during the production preparation phase to quickly predict how long the production cycle will take. This mechanism calculates this information internally without having to take the actual position setpoints of the axes into consideration.

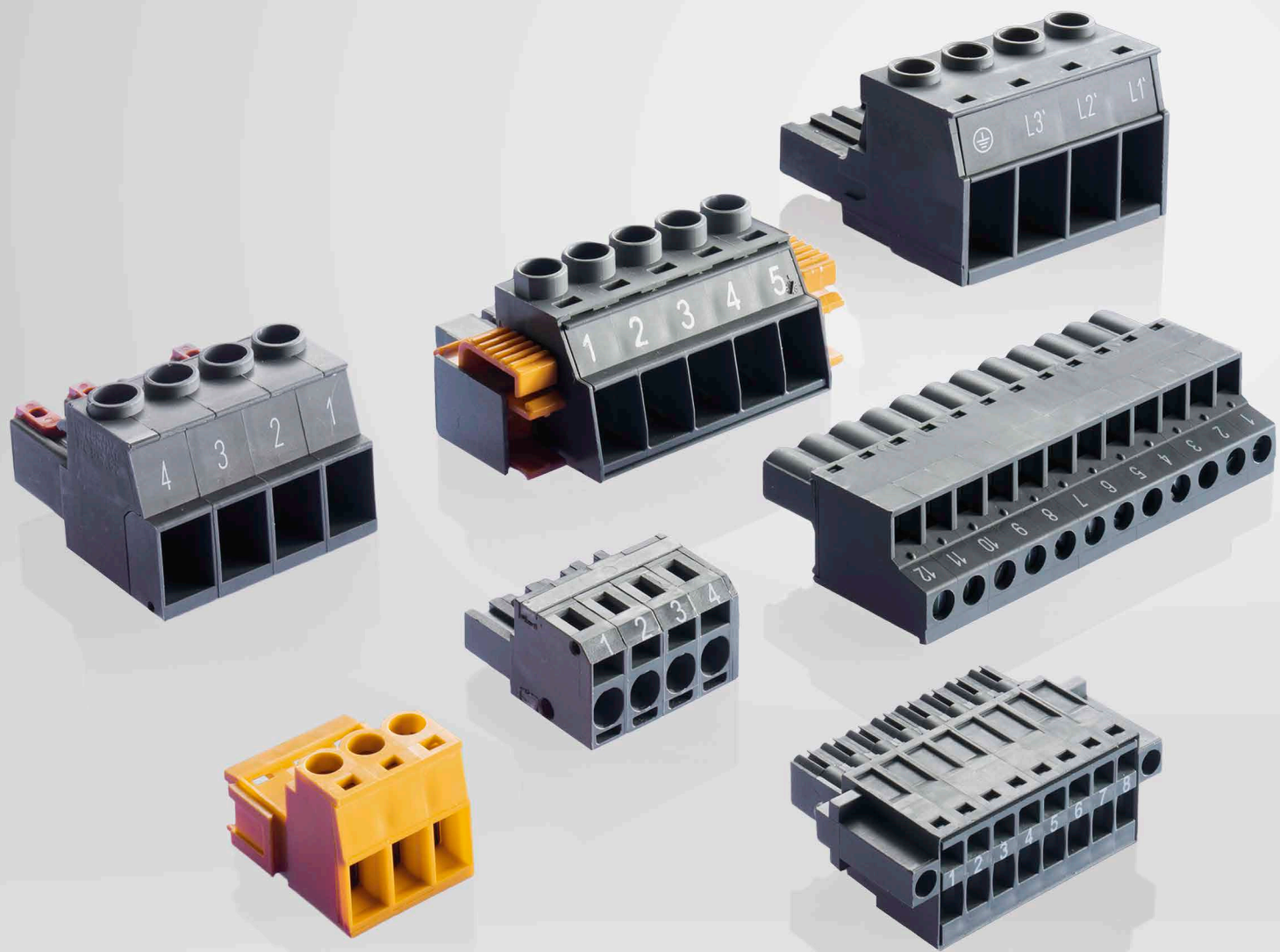
In simulation mode, a data interface can also be used to read out and display a graphic primitive (line or arc) depicting the programmed path.

In addition, the GMC system can be operated completely in a virtual controller environment (ARsim). In this case, all of the program logic for the application program and all core functions of the system are handled in a virtual controller environment in Windows. The user has full control and can scale this underlying "virtual real time" as needed (time zooming).

Distributed motion control

Using intelligent drives to control the axes saves valuable processing power and ensures a scalable system. Path and auxiliary axes can be operated locally or remotely via POWERLINK with deterministic timing.







Accessories

Accessories

Terminal blocks, infrastructure components, memory, batteries, cables and much more.

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Product overview



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Batteries

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Glass tube fuses

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Terminal blocks

0TB103.9, 0TB103.91



Terminal block	0TB103.9	0TB103.91
Note		Protected against vibration by the screw flange Nominal values according to UL
Number of pins		3 (female)
Type of terminal clamp	Screw clamp terminal block	Cage clamp terminal block ¹⁾
Cable type		Only copper wires (no aluminum wires!)
Distance between contacts		5.08 mm
Connection cross section		
AWG wire	26 to 14 AWG	26 to 12 AWG
Wire end sleeves with plastic covering		0.20 to 1.50 mm ²
Solid wires		0.20 to 2.50 mm ²
Fine strand wires	0.20 to 1.50 mm ²	0.20 to 2.50 mm ²
With wire end sleeves		0.20 to 1.50 mm ²
Tightening torque	0.4 Nm	-
Electrical characteristics	0TB103.9	0TB103.91
Nominal voltage		300 V
Nominal current ²⁾		10 A / contact
Contact resistance		≤5 mΩ

¹⁾ Cage clamp terminal blocks cannot be used side-by-side.

²⁾ The limit data for each I/O module must be taken into consideration.

0TB704.9, 0TB704.91, 0TB2105.9010, 0TB2105.9110, 0TB708.91, 0TB1108.8110



Terminal block	0TB704.9	0TB704.91	0TB2105.9010	0TB2105.9110	0TB708.91	0TB1108.8110
Note	Nominal values according to UL	Nominal values according to UL	Nominal values according to UL	Nominal values according to UL	Mechanical removal aid Nominal values according to UL	Protected against vibration by the screw flange Nominal values according to UL
Number of pins	4	4	5	5	8	8
Type of terminal clamp	Screw clamp terminal block	Cage clamp terminal block ¹⁾	Screw clamp terminal block	Cage clamp terminal block ¹⁾	Cage clamp terminal block	Cage clamp terminal block
Cable type	Only copper wires (no aluminum wires!)					
Distance between contacts	5.08 mm	5.08 mm	5.08 mm	5.08 mm	3.5 mm	3.5 mm
Connection cross section						
AWG wire	26 to 12 AWG	26 to 12 AWG	26 to 12 AWG	26 to 12 AWG	26 to 14 AWG	26 to 14 AWG
Wire end sleeves with plastic covering	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²	0.20 to 1.00 mm ²	0.20 to 1.00 mm ²
Solid wires	0.20 to 2.50 mm ²	0.20 to 2.50 mm ²	0.20 to 2.50 mm ²	0.20 to 2.50 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²
Fine strand wires	0.20 to 1.50 mm ²	0.20 to 2.50 mm ²	0.20 to 1.50 mm ²	0.20 to 2.50 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²
With wire end sleeves				0.20 to 1.50 mm ²		
Electrical characteristics	0TB704.9	0TB704.91	0TB2105.9010	0TB2105.9110	0TB708.91	0TB1108.8110
Nominal voltage	300 V					
Nominal current ²⁾	10 A / contact					
Contact resistance	≤5 mΩ	≤5 mΩ	≤5 mΩ	≤5 mΩ	≤4.2 mΩ	≤4.2 mΩ

¹⁾ Cage clamp terminal blocks cannot be used side-by-side.

²⁾ The limit data for each I/O module must be taken into consideration.

Terminal blocks

0TB710.91, 0TB1110.8010, 0TB1110.8110, 7TB710.9, 7TB710.91



Terminal block	0TB710.91	0TB1110.8010	0TB1110.8110	7TB710.9	7TB710.91
Note	Mechanical removal aid Nominal values according to UL	Protected against vibration by the screw flange nominal values according to UL	Protected against vibration by the screw flange nominal values according to UL	Nominal values according to UL	Nominal values according to UL
Number of pins	10				
Type of terminal clamp	Cage clamp terminal block	Screw clamp terminal block	Cage clamp terminal block	Screw clamp terminal block	Cage clamp terminal block
Cable type	Only copper wires (no aluminum wires!)				
Distance between contacts	3.5 mm	3.5 mm	3.5 mm	5.08 mm	5.08 mm
Connection cross section					
AWG wire	26 to 14 AWG	28 to 14 AWG	26 to 14 AWG	24 to 12 AWG	26 to 12 AWG
Wire end sleeves with plastic covering	0.20 to 1.00 mm ²	0.20 to 1.50 mm ²	0.20 to 1.00 mm ²	0.25 to 2.50 mm ²	0.20 to 1.50 mm ²
Solid wires	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²	0.20 to 2.50 mm ²	0.20 to 2.50 mm ²
Fine strand wires	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²	0.20 to 2.50 mm ²	0.20 to 2.50 mm ²
With wire end sleeves	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²	0.20 to 1.50 mm ²	0.20 to 2.50 mm ²	0.20 to 1.50 mm ²
Electrical characteristics	0TB710.91	0TB1110.8010	0TB1110.8110	7TB710.9	7TB710.91
Nominal voltage	300 V				
Nominal current ¹⁾	10 A / contact				
Contact resistance	≤4.2 mΩ	≤4.2 mΩ	≤4.2 mΩ	≤2 mΩ	≤5 mΩ

¹⁾ The limit data for each I/O module must be taken into consideration.

0TB1111.8010, 0TB1111.8110, 7TB712.9, 7TB712.91, 7TB718.9, 7TB718.91



Terminal block	0TB1111.8010	0TB1111.8110	7TB712.9	7TB712.91	7TB718.9	7TB718.91
Note	Protected against vibration by the screw flange Nominal values according to UL	Protected against vibration by the screw flange Nominal values according to UL	Mechanical removal aid Nominal values according to UL	Mechanical removal aid Nominal values according to UL	Mechanical removal aid Nominal values according to UL	Mechanical removal aid Nominal values according to UL
Number of pins	11	11	12	12	18	18
Type of terminal clamp	Screw clamp terminal block	Cage clamp terminal block	Screw clamp terminal block	Cage clamp terminal block	Screw clamp terminal block	Cage clamp terminal block
Cable type	Only copper wires (no aluminum wires!)					
Distance between contacts	3.5 mm					
Connection cross section						
AWG wire	28 to 14 AWG	26 to 14 AWG	28 to 14 AWG	26 to 14 AWG	28 to 14 AWG	26 to 14 AWG
Wire end sleeves with plastic covering	0.20 to 1.50 mm ²	0.20 to 1.00 mm ²	0.20 to 1.50 mm ²	0.20 to 1.00 mm ²	0.20 to 1.50 mm ²	0.20 to 1.00 mm ²
Solid wires				0.20 to 1.50 mm ²		
Fine strand wires				0.20 to 1.50 mm ²		
With wire end sleeves				0.20 to 1.50 mm ²		
Electrical characteristics	0TB1111.8010	0TB1111.8110	7TB712.9	7TB712.91	7TB718.9	7TB718.91
Nominal voltage	300 V					
Nominal current ¹⁾	10 A / contact					
Contact resistance	≤4.2 mΩ					

¹⁾ The limit data for each I/O module must be taken into consideration.

Terminal blocks

0TB3102-7011, 0TB3102-7012, 0TB3103-7020, 0TB3104-7011, 0TB3104-7012



Terminal block	0TB3102-7011	0TB3102-7012	0TB3103-7020	0TB3104-7011	0TB3104-7012
Note	Multi-function flange for secure, fast and tool-free locking Nominal values according to UL				
Number of pins	2	2	3	4	4
Type of terminal clamp	Screw clamp terminal block				
Cable type	Only copper wires (no aluminum wires!)				
Keying	A	B	-	A	B
Distance between contacts	7.62 mm				
Connection cross section					
AWG wire	22 to 10 AWG				
Wire end sleeves with plastic covering	0.25 to 4 mm ²				
Solid wires	0.20 to 6 mm ²				
Fine strand wires	0.20 to 6 mm ²				
With wire end sleeves	0.25 to 6 mm ²				
Electrical characteristics	0TB3102-7011	0TB3102-7012	0TB3103-7020	0TB3104-7011	0TB3104-7012
Nominal voltage	600 V				
Nominal current ¹⁾	31 A				
Contact resistance	≤4.5 mΩ				

¹⁾ The limit data for each I/O module must be taken into consideration.

0AC808.9-1



General information

Status indicators	Network activity for each channel, link/collision for each channel, supply voltage
Type	8-port industrial hub (Layer 2)
Certification	
CE	Yes
cULus	Yes
GOST-R	Yes

Interfaces

Signal	Ethernet
Design	Shielded RJ45 ports
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	10/100 Mbit/s
Transmission	
Physical layer	10BASE-T/100BASE-TX
Half-duplex	Yes
Full-duplex	No
Autonegotiation	Yes
Auto-MDI / MDIX	Yes
Hub runtime	0.64 to 0.68 μ s

Power supply

Input voltage range	18 to 30 VDC
Current consumption	Max. 150 mA
Power consumption	Max. 3 W
Design	Switched-mode power supply with reverse polarity protection diode, no overvoltage protection

Environmental conditions

Temperature	
Operation	
Horizontal	-25 to 60°C
Vertical	-25 to 60°C

Mechanical characteristics

Note	Order 1x TB704 terminal block separately
Dimensions	
Width	115 mm
Height	43 mm (51 mm with mounting rail)
Depth	86 mm

0AC401.9



General information

Input frequency	100 kHz
Power consumption	Typ. 6.0 W @ 24 V, the encoder supply (+5 V) draws 500 mA
Power supply	24 VDC
Overvoltage protection	External fuse specified at 10 AT
Certification	
CE	Yes
cULus	Yes
GOST-R	Yes

Environmental conditions

Temperature	
Operation	0 to 55°C

Mechanical characteristics

Dimensions	
Width	77 mm
Height	112.5 mm
Depth	58 mm

0G1000.00-090, 7AC911.9



General information

0G1000.00-090

7AC911.9

Terminating resistor		Can be switched on
Stress relief		Integrated
Interface		
Type	RS485	CAN
Design	9-pin male DSUB connector	9-pin female DSUB connector
Connection		For two bus lines using screw clamps
Fieldbus	PROFIBUS DP, RS485 network	-
Certification		
CE		Yes
GOST-R		Yes

Infrastructure components

ECINT1-1, ECINT1-11



General information	ECINT1-1	ECINT1-11
Terminating resistor		Can be switched on
Operating modes		Point-to-point RS422 network RS485 network
Lightning protection	-	Yes
Status indicators		RS232 signal lines, RS485 active, supply voltage
Power supply		24 VDC, maximum 4.3 W, protection against reverse polarity
Overvoltage protection		Yes
Cable length		
RS232		Max. 10 m
RS485		Max. 5000 m
Transfer rate		Max. 115.2 kbit/s
Certification		
CE		Yes
GOST-R		Yes
Environmental conditions	ECINT1-1	ECINT1-11
Temperature		
Operation		0 to 60°C
Mechanical characteristics	ECINT1-1	ECINT1-11
Dimensions		
Width		100 mm
Height		73 mm
Depth		114 mm

0AC912.9, 0AC913.92, 0AC913.93



Short description	0AC912.9	0AC913.92	0AC913.93
Bus adapter	1x CAN	2x CAN	2x CAN
General information	0AC912.9	0AC913.92	0AC913.93
Terminating resistor		Can be switched on	
Connection to controller	Via 9-pin female DSUB connector Connection made by customer	Via 30 cm cable with 9-pin DSUB housing	Via 30 cm cable with 4-pin connector
Networking	Via 9-pin terminal block	Via 9-pin male DSUB connector (C1) and 9-pin female DSUB connector (C2)	Via 9-pin male DSUB connector (C1) and 9-pin female DSUB connector (C2)
Certification			
CE		Yes	
GOST-R		Yes	

0ACS100A.00-1, 0ACS100A.90-1



Sensor properties	0ACS100A.00-1	0ACS100A.90-1
Natural resonance (mounted)		22 kHz (rated)
Sensitivity		100 mV/g \pm 10% nominal 80 Hz at 22°C
Frequency response		2 Hz to 10 kHz \pm 5% 0.8 Hz to 15 kHz \pm 3 dB
Isolation		Isolated base
Measurement range		\pm 50 g
Cross-sensitivity		<5%
Electrical characteristics	0ACS100A.00-1	0ACS100A.90-1
Electrical disturbances		Max. 0.1 mg
Broadband resolution		0.2 mg (200 μ g) over 1 Hz to 15 kHz
Spectral noise		10 Hz to 10 μ g/Hz 100 Hz to 4 μ g/Hz 1 kHz to 3 μ g/Hz
Current range		0.5 to 8 mA
Bias voltage		10 to 12 VDC
Settling time		2 s
Output impedance		Max. 200 Ω
Housing isolation		$>10^8 \Omega$ at 500 V
Environmental conditions	0ACS100A.00-1	0ACS100A.90-1
Temperature		
Operation		-55 to 140°C
Max. shock resistance		5000 g
Emitted interferences		EN 61000-6-4:2001
Immunity to disturbances		EN 61000-6-2:1999
Mechanical characteristics	0ACS100A.00-1	0ACS100A.90-1
Housing		
Material		Stainless steel
Installation	M8 x 6 mm bolt, preinstalled on sensor	M8 x 33 mm screw, included in delivery
Measurement element		PZT piezoelectric crystal (lead zirconate titanate)
Measurement execution		Compressed
Tightening torque		8 Nm
Connectors		M12

19" AT keyboard

5E9600.01-010, 5E9600.01-020



General information	5E9600.01-010	5E9600.01-020
Connection		Male PS/2 connector
Installation		Front mount installation, 19" rack
Keyboard layout	German	English
Certification		
CE		Yes
cULus		Yes
GOST-R		Yes
CE		Yes
cULus		Yes
Keys	5E9600.01-010	5E9600.01-020
Soft keys		12
Cursor keys		4
Number block		17
Other keys		71
Operating conditions	5E9600.01-010	5E9600.01-020
EN 60529 protection		Front: IP65
Environmental conditions	5E9600.01-010	5E9600.01-020
Temperature		
Operation		0 to 55°C
Mechanical characteristics	5E9600.01-010	5E9600.01-020
Dimensions		
Width		482.6 mm
Height		177 mm
Depth		35 mm

Additional accessories

0AC301.9



General information

Number of cable shield clamps	8
-------------------------------	---

Terminal block

Type of terminal clamp	4x screw clamps (dual)
------------------------	------------------------

Mechanical characteristics

Dimensions

Width	76 mm
Height	25 mm
Depth	22 mm

CompactFlash cards



Model number	Short description
0CFCRD.0128E.01	CompactFlash 128 MB WD extended temp.
0CFCRD.0512E.01	CompactFlash 512 MB WD extended temp.
5CFCRD.0512-06	CompactFlash 512 MB B&R (SLC)
5CFCRD.1024-06	CompactFlash 1 GB B&R (SLC)
5CFCRD.2048-06	CompactFlash 2 GB B&R (SLC)
5CFCRD.4096-06	CompactFlash 4 GB B&R (SLC)
5CFCRD.8192-06	CompactFlash 8 GB B&R (SLC)
5CFCRD.016G-06	CompactFlash 16 GB B&R (SLC)
5CFCRD.032G-06	CompactFlash 32 GB B&R (SLC)

CFast cards



Model number	Short description
5CFAST.2048-00	CFast card, 2 GB SLC
5CFAST.4096-00	CFast card, 4 GB SLC
5CFAST.8192-00	CFast card, 8 GB SLC
5CFAST.016G-00	CFast card, 16 GB SLC
5CFAST.032G-00	CFast card, 32 GB SLC
5CFAST.032G-10	CFast card, 32 GB MLC
5CFAST.064G-10	CFast card, 64 GB MLC
5CFAST.128G-10	CFast card, 128 GB MLC

PC cards



Model number	Short description
0MC111.9-1	PC card memory card, 2 MB FlashPROM
0MC112.9-1	PC card memory card, 4 MB FlashPROM
0MC211.9	PC card memory card, 2 MB SRAM
9A0015.99	CompactFlash adapter, for operating CompactFlash in a PC card slot

USB accessories



Model number	Short description
5CAUSB.0018-00	USB 2.0 connection cable - Type A - Type B connector - 1.8 m
5CAUSB.0050-00	USB 2.0 connection cable - Type A - Type B connector - 5 m
5MMUSB.2048-01	USB 2.0 flash drive, 2048 MB, B&R
5MMUSB.4096-01	USB 2.0 flash drive, 4096 MB, B&R

PCI/PCIE cards



Model number	Short description
5ACPCI.ETH1-01	PCI Ethernet card 1x 10/100
5ACPCI.ETH3-01	PCI Ethernet card 3x 10/100

Additional accessories

Cables



Model number	Short description
0G0001.00-090	PC - PLC/PW cable, RS232, online cable
9A0017.01	RS232 null modem cable, 0.6 m, for connecting UPS and IPC (9-pin female DSUB connector - 9-pin female DSUB connector)
9A0017.02	RS232 null modem cable, 1.8 m, for connecting UPS and IPC (9-pin female DSUB connector - 9-pin female DSUB connector)
X20CA0E61.00020	POWERLINK connection cable, RJ45 to RJ45, 0.2 m
X20CA0E61.00025	POWERLINK connection cable, RJ45 to RJ45, 0.25 m
X20CA0E61.00030	POWERLINK connection cable, RJ45 to RJ45, 0.3 m
X20CA0E61.00035	POWERLINK connection cable, RJ45 to RJ45, 0.35 m
X20CA0E61.00040	POWERLINK connection cable, RJ45 to RJ45, 0.4 m
X20CA0E61.00050	POWERLINK connection cable, RJ45 to RJ45, 0.5 m
X20CA0E61.00100	POWERLINK connection cable, RJ45 to RJ45, 1 m
X20CA0E61.00150	POWERLINK connection cable, RJ45 to RJ45, 1.5 m
X20CA0E61.00200	POWERLINK connection cable, RJ45 to RJ45, 2 m
X20CA0E61.00500	POWERLINK connection cable, RJ45 to RJ45, 5 m
X20CA0E61.01000	POWERLINK connection cable, RJ45 to RJ45, 10 m
X20CA0E61.01500	POWERLINK connection cable, RJ45 to RJ45, 15 m
X20CA0E61.02000	POWERLINK connection cable, RJ45 to RJ45, 20 m
X20CA0E61.05000	POWERLINK connection cable, RJ45 to RJ45, 50 m
X67CA0E41.0010	POWERLINK attachment cable, RJ45 to M12, 1 m
X67CA0E41.0050	POWERLINK attachment cable, RJ45 to M12, 5 m
X67CA0E41.0150	POWERLINK attachment cable, RJ45 to M12, 15 m
X67CA0E41.0500	POWERLINK attachment cable, RJ45 to M12, 50 m
X67CA0X99.1000	Cable for custom assembly, 100 m
X67CA0X99.5000	Cable for custom assembly, 500 m

Batteries



Model number	Short description
0AC200.91	Lithium batteries, 4 pcs., 3 V / 950 mAh cylindrical. We hereby state that the lithium cells contained in this shipment qualify as "partly regulated". Handle with care. If the package is damaged, inspect the cells, repack intact cells and protect the cells against short circuit. For emergency information, call RENATA SA at +41 61 319 28 27.
0AC201.91	Lithium batteries 4 pcs., 3 V / 950 mAh button cell We hereby state that the lithium cells contained in this shipment qualify as "partly regulated". Handle with care. If the package is damaged, inspect the cells, repack intact cells and protect cells against short circuits. For emergency information, call RENATA SA at + 41 61 319 28 27
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell

Glass tube fuses



Model number	Short description
0AC171.9	Glass tube fuses 5x20 mm, 20 pcs., 3.15 A, slow-blow, 250 V



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