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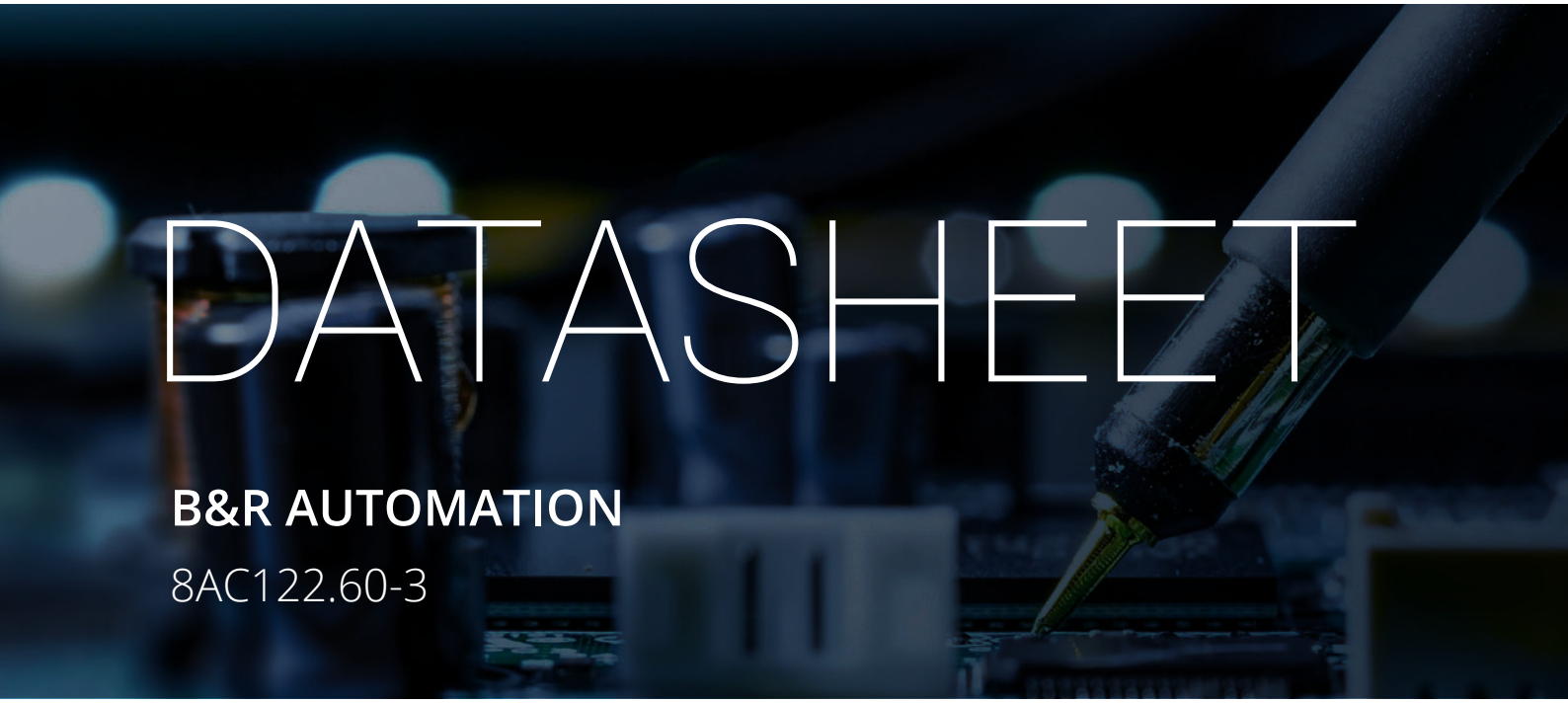

DATASHEET

B&R AUTOMATION

8AC122.60-3

OTHER SYMBOLS:

8AC122603, 8AC12260 3, 8AC12260-3, 8AC122 603, 8AC122 60 3, 8AC122 60-3, 8AC122.603, 8AC122.60 3, 8AC122.60-3

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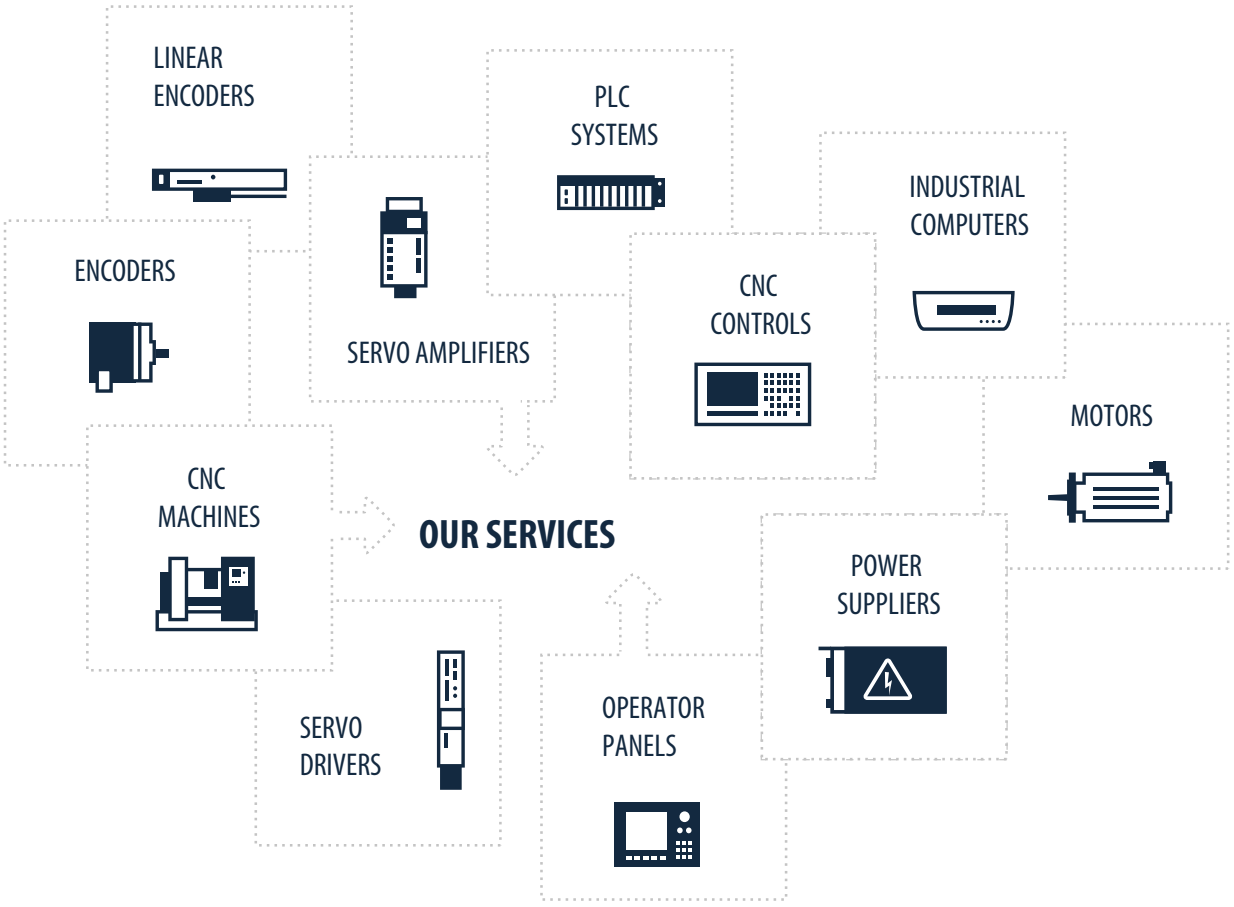

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ACOPOS
Intelligent servo drives

Increased production volume, reduced production cycles, and improved quality with greater precision become a reality with ACOPOS servo drives.

Table of contents

System characteristics

High-performance servo drive concept

The ACOPOS servo drive family is an important component of the complete automation solutions provided by B&R. Industry-specific functions and intuitive tools form the basis for short development times.

An important criteria for the performance of an automation solution is a fast and precise reaction to events dependent on the application or sudden changes in the production process. Therefore, ACOPOS servo drives work with very short scan times and communication cycles of 400 μs, which only amount to 50 μs in the control loop.

More room for innovation

The successful application of ACOPOS servo drives in the following industries demonstrates the impressive innovative power of their pioneering design: performance and function coupled with user-friendliness.

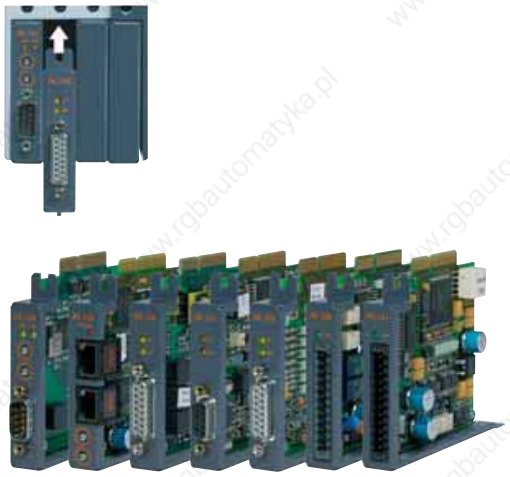
- Packaging industry
- Handling technology
- Plastics processing
- Paper and printing
- Textile industry
- Wood industry
- Metal working industry
- Semiconductor industry

Outstanding quality, robust and secure

The ACOPOS servo family was tested thoroughly during the development phase. Under difficult conditions, such as heavy vibrations or increased temperatures, the devices were subject to loads that greatly exceed the values that occur in normal everyday operation.

EMC was given special attention to facilitate use in a rough industrial environment. Field tests have been carried out under difficult conditions in addition to the tests defined in the standard. The results confirm the excellent values measured by the testing laboratory and during operation. The necessary filters, which meet CE guidelines, are also integrated in the device. Using computer-aided models, the thermal behavior of the entire system is pre-calculated based on measured currents and temperatures. This results in maximum performance by taking advantage of the system's full capabilities. ACOPOS servo drives use the information on the motor's embedded parameter chip, which contains all relevant mechanical and electronic data. The work-intensive and error-prone task of manually setting parameters is no longer necessary and start-up times are substantially reduced. During service, relevant data can be requested and the cause of problems that may exist can be determined.

The ACOPOS servo family is also available with partially-coated circuit boards. These versions are - with identical specifications - more robust in regard to environmental influences such as dust, aggressive vapors or moisture.

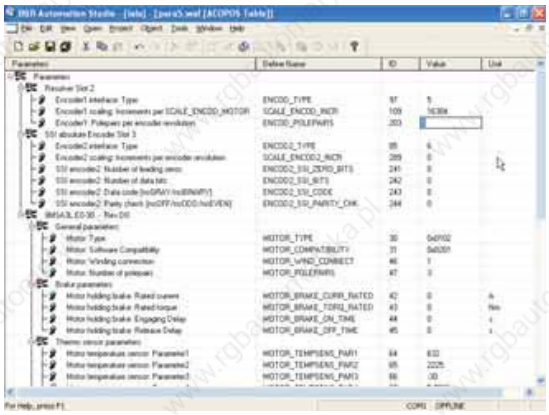


ACOPOS plug-in modules

Modular and precise with communication options

The I/O points needed to operate a servo axis are part of the standard equipment for ACOPOS servo drives. The user is provided two trigger inputs for tasks requiring precise measurements or print mark control.

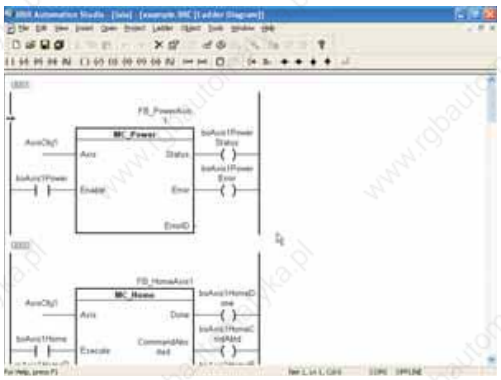
Further configuration of the ACOPOS servo drive to meet the respective application-specific demands takes place using plug-in modules. Plug-in modules are available to make network connections with other drives, controllers and visualization devices as well as for the connection of encoders, sensors and actuators. Additionally, CPU modules for controller and drive integration are also available for drive-based automation.

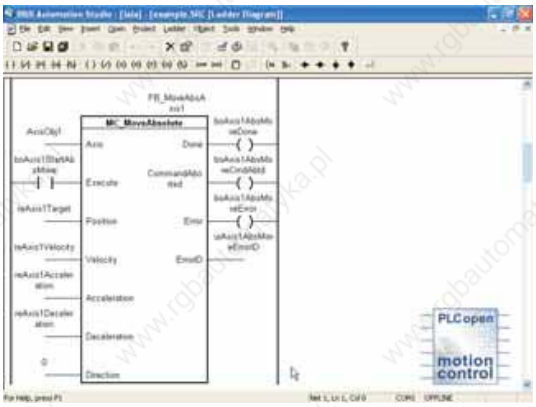


Configuring instead of programming

ACOPOS servo drives can be configured for demanding positioning tasks such as electronic gears or cam profiles. Based on long-term cooperation with customers from all over the world, B&R shares its know-how in the form of compact function blocks for many applications. Industry-specific functionality can be quickly and easily implemented in an application program.

System characteristics





PLCopen motion control function blocks

Motion control is one of the central themes in automation technology. This is partly due to its high portion of the entire automation expenses and the resulting savings potential.

The PLCopen motion control function blocks (conforming to IEC 61131-3) support the user when implementing these possibilities by providing vendor-independence and reducing development times. The user can choose between the programming languages Ladder Diagram (LD), Structured Text (ST) and the high-level language "C".

The function range of the function blocks is divided into the areas of single and multi-axis movements. In addition to the usual relative and absolute movements, the first of the two areas also includes the possibility of overlapping movements. In the area of multi-axis movements, functions such as gears, cam profile functions, up/down synchronization and differential gear (changing phase angles) are supported.

Higher productivity with smart process technology

Smart process technology meets the customer's need for cost-effective solutions and high production speeds. This freely configurable technology library is seamlessly integrated into the existing motion control product.

Using 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. For example, highly efficient and intelligent decentralized units allow seamless quality control. In the field, this significantly reduces cycle times while improving component quality.

This meets the requirements of modern motion control products such as high product quality, machine productivity along with short maintenance and down times and, to a greater extent, seamless quality control during production.

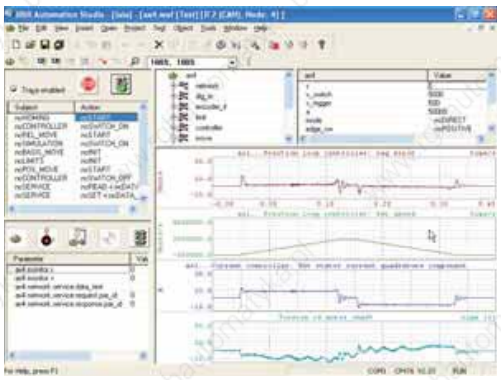
ACOPOS also perfectly suited for CNC applications

The integrated "Soft" CNC system from B&R unites all of the software components necessary for machine automation on a 64-bit processor platform. It provides sufficient computing power for complex processing machines. The integrated system architecture, together with ACOPOS servo drives, provides many opportunities regarding reaction speed, data throughput and precision, and also allows cost savings to be made.

- Uniformly integrated ACOPOS servo drive technology
- Powerful and fast-reacting
- Unlimited flexibility of PLC and CNC systems provides room for automation ideas
- 8 independent CNC channels
- Up to a total of 100 axes for positioning, CNC, electronic gears
- Individual graphic interface
- Nearly unlimited system memory for programs, diagnostics and process data
- Internet or intranet connection for inspection or remote maintenance

Leading manufacturers of water jet, laser and torch cutting production technologies are already utilizing these technological advantages.

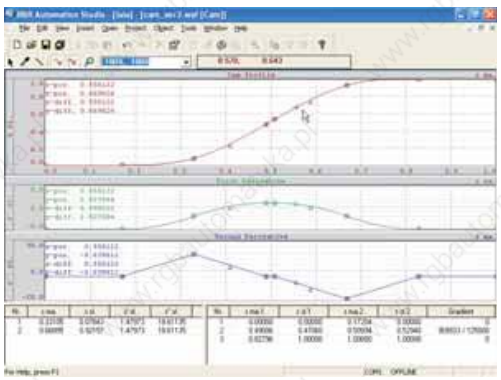
System characteristics



Quick and easy commissioning

All B&R products are programmed in a uniform manner using B&R Automation Studio with the Windows look and feel. Complex drive solutions can be created after a short orientation period. Adding hardware components and program sections, as well as their configuration, is done in dialog boxes; this reduces project development times considerably.

Axis movements can be checked without programming using NC Test. All types of movements, ranging from point-to-point to gear functions, can be carried out interactively. The reaction of the axis can be seen online in the monitor window. The trace function records relevant drive data for clear evaluation.



Tools for straightforward and efficient diagnostics

The drive is monitored in real-time using the oscilloscope function. Many trigger possibilities generate informative data for analyzing the movement during operation. The graphic display allows the user to make fine adjustments and optimizations of the movement in the microsecond range. The integration of powerful tools, such as the cam editor, reduces programming for complex coupled movements to simple drag-and-drop procedures. The results and effects on speed, acceleration and jolt can be immediately analyzed graphically.

ACOPOS servo drives

Controlling your power transmission system with ACOPOS™ servo drives from B&R allows you to fully use the advantages of an optimized system architecture. Applications that require additional positioning tasks such as torque limitation or torque control can be created quickly and elegantly. The flexible system concept for B&R servo drives is achieved using matched hardware and software components. You can select the optimal system configuration for your application and increase your competitiveness.

- Perfect integration in all B&R product families
- Object-oriented axis programming minimizes development time and increases reusability
- Integrated technology functions for industry-specific tasks
- Operation of synchronous and induction motors possible
- Current controller scan time up to 50µs
- Reduced commissioning and service times using "embedded motor parameter chip"
- CAN bus and POWERLINK network connection
- Input voltage range from 400 - 480 VAC (±10 %) for many areas of use
- Connection possibilities for all standard encoder systems
- Up to two free slots for optional technology modules
- Electronic secure restart inhibit integrated
- Optionally available as version with partially-coated circuit boards - more robust in regard to environmental influences

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 devices in 4 groups. They offer connection possibilities for all standard encoder systems and modular fieldbus interfaces. ACOPOS servo drives are suitable for both synchronous and induction servo motors and have built-in line filters to meet the limit values for CISPR11, Group 2, Class A.

	8V1010.50-2, 8V1010.501-2 8V1016.50-2, 8V1016.501-2 8V1010.00-2, 8V1010.001-2 8V1016.00-2, 8V1016.001-2	8V1022.00-2, 8V1022.001-2 8V1045.00-2, 8V1045.001-2 8V1090.00-2, 8V1090.001-2	8V1180.00-2, 8V1180.001-2 8V1320.00-2, 8V1320.001-2	8V1640.00-2, 8V1640.001-2 8V128M.00-2, 8V128M.001-2
Power connections	Plug connection	Plug connection	Plug connection	Fixed
Integrated line filter	Yes	Yes	Yes	Yes
Mains 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	External or internal via DC bus
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) External DC bus power supply 0PS320.1 (24V / 20A) can be used.

2) The braking resistor integrated in the ACOPOS servo drives 1640 and 128M is dimensioned so that it is possible to brake to a stop (in a typical drive situation).

24 VDC supply during power failures

In order to be able to provide the stop function for category 1 according to IEC 60204-1 during a power failure, the 24 VDC supply voltage for the servo drives as well as encoders, sensors and the safety circuit must remain active during the entire stopping procedure. The ACOPOS servo drives recognize a power failure and can immediately initiate active braking of the motor. The brake energy that occurs when braking is returned to the DC bus and the DC bus power supply can use it to create the 24 VDC supply voltage. An external DC bus power supply must be used for ACOPOS servo drives 8V1010 to 8V1090. A DC bus power supply is integrated in ACOPOS servo drives 8V1180 to 8V128M. The ACOPOS servo drives with an integrated DC bus power supply provide the 24 VDC supply for the servo drive and also a 24 VDC output to supply encoders, sensors and the safety circuit. In may cases, it is not necessary to use an uninterruptible power supply (UPS) which is otherwise needed.

Typical topologies

ACOPOS configurations

ACOPOS servo drives include multiple technology-specific functions with performance, flexibility and capability in the field which has been remarkably proven in countless applications. The ACOPOS functions listed below are basic functions which the user can switch between as needed within 400 µs. Furthermore, manipulations such as changes in product length, print mark control, overlying torque control, brief process adaptations and quality checks can be carried out at any time.

- Point-to-point
- Electronic gears
- Electronic compensation gears
- Cross cutters
- Electronic cam profiles
- Flying saws
- Line shaft
- CNC

ACOPOS servo drives can be used in various configurations depending on the network type and the requirements of the application. The functions listed above are available to the user in each of the topology examples shown.

Reaction speeds are not influenced by the network and control system being used if technology functions are processed directly on the ACOPOS servo drive. Additional sensors and actuators must be integrated in the control and adaptation for more complex processes. In these cases, the level of performance depends mostly on the type of network and control system being used.
The topology examples shown on the following pages provide an overview of the bandwidths which are possible with B&R automation components.

ACOPOS in the POWERLINK network

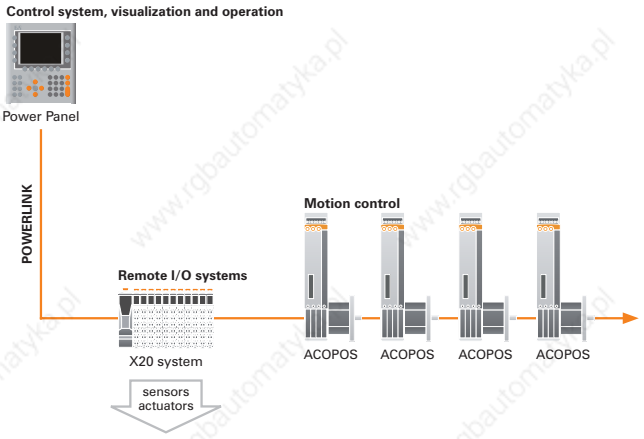
High-performance machine architectures require flexible networks and fieldbuses. With POWERLINK, a network is available to the user that fully meets the high demands of dynamic motion systems. POWERLINK adapts to the requirements of the machine and the system. The rigid coupling of many axes with controllers, industrial PCs, I/O systems and operator panels allows machines and systems to be created with the highest level of precision. Compatibility to standard Ethernet also reduces the number of networks and fieldbuses on the machine level.

Successful areas of use for these topologies:

- Packaging industry
- Handling technology
- Plastics processing
- Paper and printing
- Textile industry
- Wood industry
- Metal working industry
- Semiconductor industry

Compact, modular motion control applications

- Modular machine architecture, up to 100 m distance between the individual axes
- Minimal wiring required due to line structure (no ring)
- No additional infrastructure components needed
- Drive control loop synchronized to the PLC program

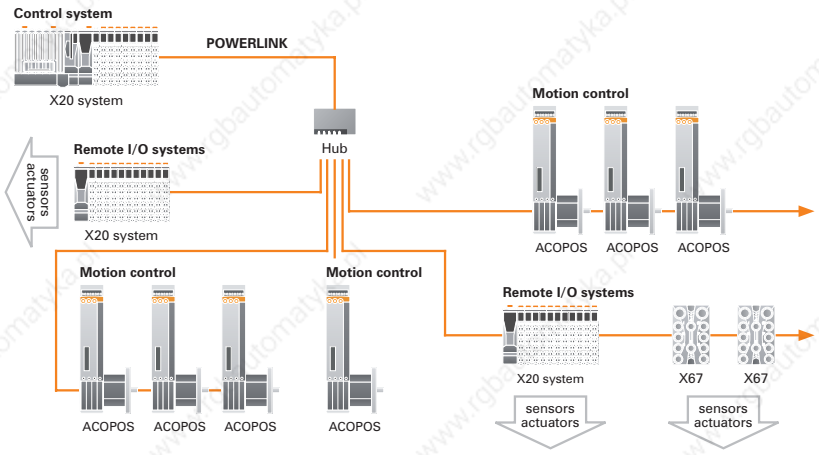


Components and technologies		
Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	Synchronous motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Network and fieldbuses	POWERLINK	611

Typical topologies

Extensive, modular motion control applications with up to 253 axes

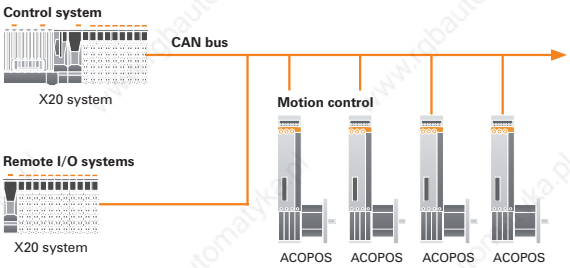
- Modular machine architecture, up to 100 m distance between the individual axes
- Optimized wiring, due to mixed star-line structure
- Nodes with fast and slow scan rates can be operated within one network. This eliminates the need to divide the network into fast and slow segments.
- Drive control loop synchronized to the PLC program



Components and technologies			
Control system	X20 System: Slice-based I/O and control system		37
Motion control	ACOPOS: Intelligent servo drives		1251
	Synchronous motors: Dynamic precision drives		1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system		37
	X67 System: Remote I/O with IP67 protection		419
Network and fieldbuses	Inside the machine	POWERLINK	611
	Host/line communication	Ethernet TCP/IP	

ACOPOS in a CAN bus network

The dynamic requirements for small and mid-sized machines with several axes can be handled efficiently using a CAN bus. The CAN bus is a cost-effective fieldbus for networking ACOPOS servo drives with controllers, industrial PCs, I/O systems and operator panels.

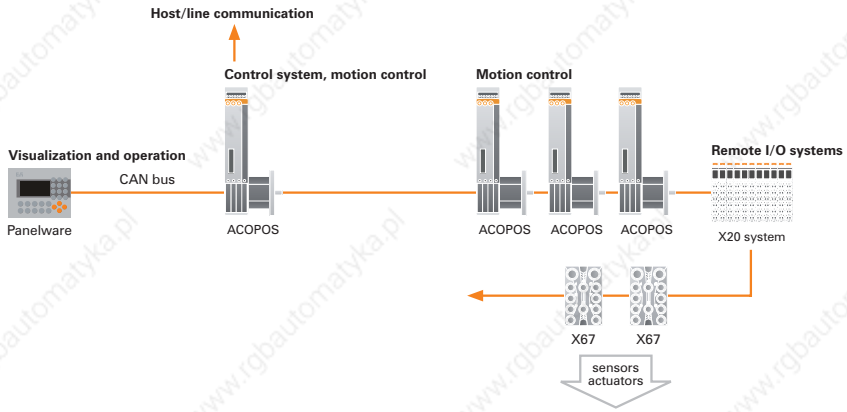


Components and technologies		
Control system	X20 System: Slice-based I/O and control system	37
Motion control	ACOPOS: Intelligent servo drives	1251
	Synchronous motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Network and fieldbuses	CAN bus	611

Typical topologies

Drive-based control

The controller is located centrally on an ACOPOS servo drive. The drives are networked and synchronized with each other via the CAN bus. As a result, electronic gear and cam profile applications as well as CNC applications are possible in addition to simple point-to-point movements. Control of the simple operation/visualization is handled by the controller on the ACOPOS servo drive. I/O signals are connected in the switching cabinet or directly in the machine room. By eliminating the need for an external controller, even very limited space can be used optimally.



Components and technologies			
Control system	ACOPOS: Intelligent servo drives		1251
Visualization and operation	Panelware: Compact operator panels		773
Motion control	ACOPOS: Intelligent servo drives		1251
	Synchronous motors: Dynamic precision drives		1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system		37
	X67 System: Remote I/O with IP67 protection		419
Network and fieldbuses	Inside the machine	CAN bus	611
	Host/line communication	Ethernet TCP/IP	

Product overview

ACOPOS servo drives

Model number	Short description	
8V1010.50-2	Servo drive 3x 110-230V / 1x110-230V, 2.0A, 0.45kW, line filter, braking resistor and electronic secure restart inhibit integrated	1270
8V1010.501-2	Servo drive 3x 110-230V / 1x110-230V, 2.0A, 0.45kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1270
8V1016.50-2	Servo drive 3x 110-230V / 1x110-230V, 3.2A, 0.7kW, line filter, braking resistor and electronic secure restart inhibit integrated	1270
8V1016.501-2	Servo drive 3x 110-230V / 1x110-230V, 3.2A, 0.7kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1270
8V1010.00-2	Servo drive 3x 400-480V 1.0A 0.45kW, line filter, braking resistor and electronic secure restart inhibit integrated	1274
8V1010.001-2	Servo drive 3x 400-480V, 1.0A, 0.45kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1274
8V1016.00-2	Servo drive 3x 400-480V, 1.6A, 0.7kW, line filter, braking resistor and electronic secure restart inhibit integrated	1274
8V1016.001-2	Servo drive 3x 400-480V, 1.6A, 0.7kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1274

Model number	Short description	
8V1022.00-2	Servo drive 3x 400-480V, 2.2A, 1kW, line filter, braking resistor and electronic secure restart inhibit integrated	1278
8V1022.001-2	Servo drive 3x 400-480V, 2.2A, 1kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1278
8V1045.00-2	Servo drive 3x 400-480V, 4.4A, 2kW, line filter, braking resistor and electronic secure restart inhibit integrated	1278
8V1045.001-2	Servo drive 3x 400-480V, 4.4A, 2kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1278
8V1090.00-2	Servo drive 3x 400-480V, 8.8A, 4kW, line filter, braking resistor and electronic secure restart inhibit integrated	1278
8V1090.001-2	Servo drive 3x 400-480V, 8.8A, 4kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1278

Model number	Short description	
8V1180.00-2	Servo drive 3x 400-480V, 19A, 9kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated	1282
8V1180.001-2	Servo drive 3x 400-480V, 34A, 16kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated, coated	1282
8V1320.00-2	Servo drive 3x 400-480V, 34A, 16kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated	1282
8V1320.001-2	Servo drive 3x 400-480V, 34A, 16kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated, coated	1282

Model number	Short description	
8V1640.00-2	Servo drive 3x 400-480V, 64A, 32kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated	1286
8V1640.001-2	Servo drive 3x 400-480V, 64A, 32kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated, coated	1286
8V128M.00-2	Servo drive 3x 400-480V, 128A, 64kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated	1286
8V128M.001-2	Servo drive 3x 400-480V, 128A, 64kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated, coated	1286

ACOPOS plug-in modules

Network modules

Model number	Short description	
8AC110.60-2	ACOPOS plug-in module, CAN interface	1290
8AC114.60-2	ACOPOS plug-in module, POWERLINK V2 interface	1291

Encoder modules

Model number	Short description	
8AC120.60-1	ACOPOS insert module, EnDat encoder and sine incremental encoder interface	1292
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	1294
8AC122.60-3	ACOPOS plug-in module, resolver interface	1296
8AC123.60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface	1298

I/O modules

Model number	Short description	
8AC130.60-1	ACOPOS plug-in module, 8 digital I/O configurable in pairs as 24V input or as output 400/100 mA, 2 digital outputs 2A, order TB712 terminal block separately.	1300
8AC131.60-1	ACOPOS plug-in module, 2 analog inputs ±10V, 2 digital I/O points which can be configured as a 24V input or 45 mA output, order TB712 terminal block separately.	1303

CPU modules

Model number	Short description	
8AC140.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately.	1306
8AC140.60-3	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately.	1306
8AC140.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately.	1306
8AC141.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
8AC141.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310

Product overview

Accessories

Motor cables 1.5 mm²

Model number	Short description	
8CM005.12-1	Motor cable, length 5 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1314
8CM007.12-1	Motor cable, length 7 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1314
8CM010.12-1	Motor cable, length 10 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1314
8CM015.12-1	Motor cable, length 15 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1314
8CM020.12-1	Motor cable, length 20 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1314
8CM025.12-1	Motor cable, length 25 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1314

Motor cables 4 mm²

Model number	Short description	
8CM005.12-3	Motor cable, length 5 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1315
8CM007.12-3	Motor cable, length 7 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1315
8CM010.12-3	Motor cable, length 10 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1315
8CM015.12-3	Motor cable, length 15 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1315
8CM020.12-3	Motor cable, length 20 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1315
8CM025.12-3	Motor cable, length 25 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1315

Motor cables 10 mm²

Model number	Short description	
8CM005.12-5	Motor cable, length 5 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1316
8CM007.12-5	Motor cable, length 7 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1316
8CM010.12-5	Motor cable, length 10 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1316
8CM015.12-5	Motor cable, length 15 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1316
8CM020.12-5	Motor cable, length 20 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1316
8CM025.12-5	Motor cable, length 25 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1316

Motor cables 35 mm²

Model number	Short description	
8CM005.12-8	Motor cable, length 5 m, 4 x 35 mm² + 2 x 2 x 1.5 mm², can be used in drag chains, UL/CSA listed	1317
8CM007.12-8	Motor cable, length 7 m, 4 x 35 mm² + 2 x 2 x 1.5 mm², can be used in drag chains, UL/CSA listed	1317
8CM010.12-8	Motor cable, length 10 m, 4 x 35 mm² + 2 x 2 x 1.5 mm², can be used in drag chains, UL/CSA listed	1317
8CM015.12-8	Motor cable, length 15 m, 4 x 35 mm² + 2 x 2 x 1.5 mm², can be used in drag chains, UL/CSA listed	1317
8CM020.12-8	Motor cable, length 20 m, 4 x 35 mm² + 2 x 2 x 1.5 mm², can be used in drag chains, UL/CSA listed	1317
8CM025.12-8	Motor cable, length 25 m, 4 x 35 mm² + 2 x 2 x 1.5 mm², can be used in drag chains, UL/CSA listed	1317

EnDat cables

Model number	Short description	
8CE005.12-1	EnDat cable, length 5 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified	1318
8CE007.12-1	EnDat cable, length 7 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified	1318
8CE010.12-1	EnDat cable, length 10 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified	1318
8CE015.12-1	EnDat cable, length 15 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified	1318
8CE020.12-1	EnDat cable, length 20 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified	1318
8CE025.12-1	EnDat cable, length 25 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified	1318

Resolver cables

Model number	Short description	
8CR005.12-1	Resolver cable, length 5 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified	1319
8CR007.12-1	Resolver cable, length 7 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified	1319
8CR010.12-1	Resolver cable, length 10 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified	1319
8CR015.12-1	Resolver cable, length 15 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified	1319
8CR020.12-1	Resolver cable, length 20 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified	1319
8CR025.12-1	Resolver cable, length 25 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified	1319

Single-phase servo drives
8V1010, 8V1016

8V1010.5xx-2

8V1016.5xx-2

- Designed for operation on a single-phase or three-phase power mains
- Modular mechanical structure plug-in modules
- Integrated power filter
- Integrated braking resistor
- Integrated electronic restart inhibit

General information	**8V1010.50-2, 8V1010.501-2**	**8V1016.50-2, 8V1016.501-2**
C-UL-US listed	Yes	Yes
Power mains connection	**8V1010.50-2, 8V1010.501-2**	**8V1016.50-2, 8V1016.501-2**
Mains input voltage	3x 110 VAC to 230 VAC ±10% or 1x 110 VAC to 230 VAC ±10%, power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)	3x 110 VAC to 230 VAC ±10% or 1x 110 VAC to 230 VAC ± 10% power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Installed load	Max. 1.35 kVA	Max. 2.1 kVA
Starting current	5 A (at 230 VAC)	5 A (at 230 VAC)
Switch-on interval	> 10 sec	> 10 sec
Power loss at max. device power without braking resistor	80 W	110 W
24 VDC supply	**8V1010.50-2, 8V1010.501-2**	**8V1016.50-2, 8V1016.501-2**
Input voltage [1]	24 VDC +25% / -20%	24 VDC +25% / -20%
Input capacitance	5600 µF	5600 µF
Current consumption [2]	Max. 1.47 A + current for motor holding brake	Max. 1.47 A + current for motor holding brake

1) When using motor holding brakes, the valid input voltage range is reduced. The input voltage range should be selected so that the proper supply voltage for the motor holding brake can be maintained.

2) The current requirements depend on the configuration of the ACOPOS servo drive.

DC bus	**8V1010.50-2, 8V1010.501-2**	**8V1016.50-2, 8V1016.501-2**
DC bus capacitance	2040 µF	2040 µF
Motor connector	**8V1010.50-2, 8V1010.501-2**	**8V1016.50-2, 8V1016.501-2**
Continuous current [1]	2.3 A_{eff}	3.6 A_{eff}
Reduction of continuous current depending on ambient temperature [2]		
Mains input voltage: 400 VAC		
Switching frequency 20 kHz	No reduction	No reduction
Switching frequency 10 kHz	**No reduction**	**No reduction**
Switching frequency 5 kHz	No reduction	No reduction
Mains input voltage: 480 VAC		
Switching frequency 20 kHz	No reduction	No reduction
Switching frequency 10 kHz	**No reduction**	**No reduction**
Switching frequency 5 kHz	No reduction	No reduction
Reduction of continuous current depending on altitude		
starting at 500 m above sea level	0.23 A_{eff} per 1000 m	0.36 A_{eff} per 1000 m
Maximum current	7.8 A_{eff}	12 A_{eff}
Rated switching frequency	10 kHz	10 kHz
Maximum motor line length	15 m	15 m
Protective measures	Short circuit & overload protection	Short circuit & overload protection

1) Valid in the following conditions: Mains input voltage 230 VAC, nominal switching frequency, 40° C ambient temperature, installation altitudes < 500 m above sea level.2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.

Motor holding brake connection	**8V1010.50-2, 8V1010.501-2**	**8V1016.50-2, 8V1016.501-2**
Maximum output current	1.3 A	1.3 A
Max. number of switching cycles	Unlimited since done electronically	Unlimited since done electronically
Braking resistor	**8V1010.50-2, 8V1010.501-2**	**8V1016.50-2, 8V1016.501-2**
Peak power output	1.9 kW	1.9 kW
Continuous power	130 W	130 W

Trigger inputs	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Number of inputs	2	2
Wiring	Sink	Sink
Electrical isolation		
Input – ACOPOS	Yes	Yes
Input – Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA
Switching delay		
Positive edge	52 µs ± 0.5 µs (digitally filtered)	52 µs ± 0.5 µs (digitally filtered)
Negative edge	53 µs ± 0.5 µs (digitally filtered)	53 µs ± 0.5 µs (digitally filtered)
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V
Limit switch and reference inputs	**8V1010.50-2, 8V1010.501-2**	**8V1016.50-2, 8V1016.501-2**
Number of inputs	3	3
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 4 mA	Approx. 4 mA
Switching delay	Max. 2.0 ms	Max. 2.0 ms
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V
Enable input	**8V1010.50-2, 8V1010.501-2**	**8V1016.50-2, 8V1016.501-2**
Number of inputs	1	1
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA
Switching delay		
Enable 1 -> 0, PWM off	Max. 2.0 ms	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 µs	Max. 100 µs
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V

Single-phase servo drives
8V1010, 8V1016

Operational conditions	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Ambient temperature during operation	5 to 40°C	5 to 40°C
Max. ambient temperature [1]	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m
Maximum installation altitude [2]	2000 m	2000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	II	II
EN 60529 protection	IP20	IP20

1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.

2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

Storage and transport conditions	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C

Mechanical characteristics	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Dimensions		
Width	58.5 mm	58.5 mm
Height	257 mm	257 mm
Depth	220 mm	220 mm
Weight	2.5 kg	2.5 kg

Optional accessories		
8AC110.60-2	ACOPOS plug-in module, CAN interface	1290
8AC114.60-2	ACOPOS plug-in module, POWERLINK V2 interface	1291
8AC120.60-1	ACOPOS insert module, EnDat encoder and sine incremental encoder interface	1292
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	1294
8AC122.60-3	ACOPOS plug-in module, resolver interface	1296
8AC123.60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface	1298
8AC130.60-1	ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately.	1300
8AC131.60-1	ACOPOS plug-in module, 2 analog inputs ±10V, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately.	1303
8AC140.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately.	1306
8AC140.60-3	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately.	1306
8AC140.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately.	1306
8AC141.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
8AC141.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
0PS320.1	24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	659
8CM005.12-1	Motor cable, length 5 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314
8CM007.12-1	Motor cable, length 7 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314
8CM010.12-1	Motor cable, length 10 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314
8CM015.12-1	Motor cable, length 15 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314

Servo drives
8V1010, 8V1016

8V1010.0xx-2

8V1016.0xx-2

- Modular mechanical structure using insert modules
- Integrated power filter
- Integrated braking resistor
- Integrated electronic restart inhibit

General information	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
C-UL-US listed	Yes	Yes
Power mains connection	**8V1010.00-2, 8V1010.001-2**	**8V1016.00-2, 8V1016.001-2**
Mains input voltage	3x 400 VAC to 480 VAC ±10%, power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)	3x 400 VAC to 480 VAC ±10%, power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Installed load	Max. 1.35 kVA	Max. 2.1 kVA
Starting current	2 A (at 400 VAC)	2 A (at 400 VAC)
Switch-on interval	> 10 sec	> 10 sec
Power loss at max. device power without Braking resistor	80 W	110 W
24 VDC supply	**8V1010.00-2, 8V1010.001-2**	**8V1016.00-2, 8V1016.001-2**
Input voltage [1]	24 VDC +25% / -20%	24 VDC +25% / -20%
Input capacitance	5600 µF	5600 µF
Current consumption [2]	Max. 1.47 A + current for motor holding brake	Max. 1.47 A + current for motor holding brake

1)When using motor holding brakes, the valid input voltage range is reduced. The input voltage range should be selected so that the proper supply voltage for the motor holding brake can be maintained.

2) The current requirements depend on the configuration of the ACOPOS servo drive.

DC bus	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
DC bus capacitance	165 µF	165 µF
Motor connector	**8V1010.00-2, 8V1010.001-2**	**8V1016.00-2, 8V1016.001-2**
Continuous current [1]	1 A_{eff}	1.6 A_{eff}
Reduction of continuous current depending on the ambient temperature [2]		
Mains input voltage: 400 VAC		
Switching frequency 20 kHz	No reduction	No reduction
Switching frequency 10 kHz	**No reduction**	**No reduction**
Switching frequency 5 kHz	No reduction	No reduction
Mains input voltage: 480 VAC		
Switching frequency 20 kHz	0.13 A_{eff} per °C (starting at 45° C)	0.13 A_{eff} per °C (starting from 40°C)
Switching frequency 10 kHz	**No reduction**	**No reduction**
Switching frequency 5 kHz	No reduction	No reduction
Reduction of continuous current depending on Installation altitude greater than 500 m above sea level	0.1 A_{eff} per 1000 m	0.16 A_{eff} per 1000 m
Maximum current	2.8 A_{eff}	5 A_{eff}
Rated switching frequency	10 kHz	10 kHz
Maximum motor line length	15 m	15 m
Protective measures	Short circuit and overload protection	Short circuit and overload protection

1) Valid in the following conditions: Mains input voltage 400 VAC, nominal switching frequency, 40°C ambient temperature, installation altitudes < 500 m above sea level.

2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.

Motor holding brake connection	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Maximum output current	1.3 A	1.3 A
Max. number of switching cycles	Unlimited since done electronically	Unlimited since done electronically
Braking resistor	**8V1010.00-2, 8V1010.001-2**	**8V1016.00-2, 8V1016.001-2**
Peak power output	2 kW	2 kW
Continuous power	130 W	130 W

Trigger inputs	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Number of inputs	2	2
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA
Switching delay		
Positive edge	52 µs ± 0.5 µs (digitally filtered)	52 µs ± 0.5 µs (digitally filtered)
Negative edge	53 µs ± 0.5 µs (digitally filtered)	53 µs ± 0.5 µs (digitally filtered)
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V
Limit switch and reference inputs	**8V1010.00-2, 8V1010.001-2**	**8V1016.00-2, 8V1016.001-2**
Number of inputs	3	3
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 4 mA	Approx. 4 mA
Switching delay	Max. 2.0 ms	Max. 2.0 ms
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V
Enable input	**8V1010.00-2, 8V1010.001-2**	**8V1016.00-2, 8V1016.001-2**
Number of inputs	1	1
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA
Switching delay		
Enable 1 -> 0, PWM off	Max. 2.0 ms	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 µs	Max. 100 µs
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V

Servo drives
8V1010, 8V1016

Operational conditions	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Ambient temperature during operation	5 to 40°C	5 to 40°C
Max. ambient temperature [1]	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m
Maximum installation altitude [2]	2000 m	2000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	II	II
EN 60529 protection	IP20	IP20

1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.

2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

Storage and transport conditions	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C

Mechanical characteristics	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Dimensions		
Width	58.5 mm	58.5 mm
Height	257 mm	257 mm
Depth	220 mm	220 mm
Weight	2.5 kg	2.5 kg

Optional accessories		
8AC110.60-2	ACOPOS plug-in module, CAN interface	1290
8AC114.60-2	ACOPOS plug-in module, POWERLINK V2 interface	1291
8AC120.60-1	ACOPOS insert module, EnDat encoder and sine incremental encoder interface	1292
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	1294
8AC122.60-3	ACOPOS plug-in module, resolver interface	1296
8AC123.60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface	1298
8AC130.60-1	ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately	1300
8AC131.60-1	ACOPOS plug-in module, 2 analog inputs ±10V, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately	1303
8AC140.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus-DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately	1306
8AC140.60-3	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately.	1306
8AC140.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately	1306
8AC141.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link master interface, 3 digital I/O points can be configured as a 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately	1310
8AC141.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
0PS320.1	24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	659
8CM005.12-1	Motor cable, length 5 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314
8CM007.12-1	Motor cable, length 7 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314
8CM010.12-1	Motor cable, length 10 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314
8CM015.12-1	Motor cable, length 15 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314

Servo drives
8V1022, 8V1045, 8V1090

8V1022.0xx-2

8V1045.0xx-2

8V1090.0xx-2

- Modular mechanical structure using insert modules
- Integrated power filter
- Integrated braking resistor
- All connections made using plug-in connectors
- Integrated electronic restart inhibit

General information	**8V1022.00-2, 8V1022.001-2**	**8V1045.00-2, 8V1045.001-2**	**8V1090.00-2, 8V1090.001-2**
C-UL-US listed	Yes	Yes	Yes
Power mains connection	**8V1022.00-2, 8V1022.001-2**	**8V1045.00-2, 8V1045.001-2**	**8V1090.00-2, 8V1090.001-2**
Mains input voltage	3x 400 VAC to 480 VAC ± 10% power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)	3x 400 VAC to 480 VAC ± 10% power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)	3x 400 VAC to 480 VAC ± 10% power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Installed load	Max. 3 kVA	Max. 5 kVA	Max. 10 kVA
Starting current at 400 VAC	4 A	7 A	7 A
Switch-on interval	> 10 sec	> 10 sec	> 10 sec
Power loss at max. device power without braking resistor	Approx. 120 W	Approx. 180 W	Approx. 200 W
24 VDC supply	**8V1022.00-2, 8V1022.001-2**	**8V1045.00-2, 8V1045.001-2**	**8V1090.00-2, 8V1090.001-2**
Input voltage [1]	24 VDC +25% / -25%	24 VDC +25% / -25%	24 VDC +25% / -25%
Input capacitance	8200 µF	8200 µF	8200 µF
Current consumption [2]	Max. 2.5 A + current for motor holding brake	Max. 2.5 A + current for motor holding brake	Max. 2.5 A + current for motor holding brake

1) When using motor holding brakes, the valid input voltage range is reduced. The input voltage range should be selected so that the proper supply voltage for the motor holding brake can be maintained.

2) The current requirements depend on the configuration of the ACOPOS servo drive.

DC bus	**8V1022.00-2, 8V1022.001-2**	**8V1045.00-2, 8V1045.001-2**	**8V1090.00-2, 8V1090.001-2**
DC bus capacitance	235 µF	235 µF	470 µF
Motor connector	**8V1022.00-2, 8V1022.001-2**	**8V1045.00-2, 8V1045.001-2**	**8V1090.00-2, 8V1090.001-2**
Continuous current [1]	2.2 A_{eff}	4.4 A_{eff}	8.8 A_{eff}
Reduction of continuous current depending on the ambient temperature [2]			
Mains input voltage: 400 VAC			
Switching frequency 20 kHz	**No reduction**	**0.13 A_{eff} per °C (from 45°C)**	0.18 A_{eff} per °C (from 30°C)
Switching frequency 10 kHz	No reduction	No reduction	**0.18 A_{eff} per °C (from 54°C)**
Switching frequency 5 kHz	No reduction	No reduction	No reduction
Mains input voltage: 480 VAC			
Switching frequency 20 kHz	**0.13 A_{eff} per °C (from 51°C)**	**0.13 A_{eff} per °C (from 35°C)**	0.18 A_{eff} per °C (from 18°C)
Switching frequency 10 kHz	No reduction	No reduction	**0.18 A_{eff} per °C (from 48°C)**
Switching frequency 5 kHz	No reduction	No reduction	No reduction
Reduction of continuous current depending on altitude			
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
Maximum current	14 A_{eff}	24 A_{eff}	24 A_{eff}
Rated switching frequency	20 kHz	20 kHz	10 kHz
Maximum motor line length	25 m	25 m	25 m
Protective measures	Short circuit & overload protection	Short circuit & overload protection	Short circuit & overload protection

1) Valid in the following conditions: Mains input voltage 400 VAC, nominal switching frequency, 40° C ambient temperature, installation altitudes < 500 m above sea level.2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.

Motor holding brake connection	**8V1022.00-2, 8V1022.001-2**	**8V1045.00-2, 8V1045.001-2**	**8V1090.00-2, 8V1090.001-2**
Maximum output current	1 A	1 A	1 A
Max. number of switching cycles	Approx. 240,000	Approx. 240,000	Approx. 240,000
Braking resistor	**8V1022.00-2, 8V1022.001-2**	**8V1045.00-2, 8V1045.001-2**	**8V1090.00-2, 8V1090.001-2**
Peak power output	3.5 kW	7 kW	7 kW
Continuous power	130 W	200 W	200 W

Trigger inputs	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Number of inputs	2	2	2
Wiring	Sink	Sink	Sink
Electrical isolation			
Input - ACOPOS	Yes	Yes	Yes
Input - Input	No	No	No
Input voltage			
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	>15 V	>15 V	>15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA	Approx. 10 mA
Switching delay			
Positive edge	52 µs ± 0.5 µs (digitally filtered)	52 µs ± 0.5 µs (digitally filtered)	52 µs ± 0.5 µs (digitally filtered)
Negative edge	53 µs ± 0.5 µs (digitally filtered)	53 µs ± 0.5 µs (digitally filtered)	53 µs ± 0.5 µs (digitally filtered)
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V	Max. ±38 V
Limit switch and reference inputs	**8V1022.00-2, 8V1022.001-2**	**8V1045.00-2, 8V1045.001-2**	**8V1090.00-2, 8V1090.001-2**
Number of inputs	3	3	3
Wiring	Sink	Sink	Sink
Electrical isolation			
Input - ACOPOS	Yes	Yes	Yes
Input - Input	No	No	No
Input voltage			
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	>15 V	>15 V	>15 V
Input current at rated voltage	Approx. 4 mA	Approx. 4 mA	Approx. 4 mA
Switching delay	Max. 2.0 ms	Max. 2.0 ms	Max. 2.0 ms
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V	Max. ±38 V
Enable input	**8V1022.00-2, 8V1022.001-2**	**8V1045.00-2, 8V1045.001-2**	**8V1090.00-2, 8V1090.001-2**
Number of inputs	1	1	1
Wiring	Sink	Sink	Sink
Electrical isolation			
Input - ACOPOS	Yes	Yes	Yes
Input voltage			
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	>15 V	>15 V	>15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA	Approx. 30 mA
Switching delay			
Enable 1 -> 0, PWM off	Max. 2.0 ms	Max. 2.0 ms	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 µs	Max. 100 µs	Max. 100 µs
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V	Max. ±38 V

Servo drives
8V1022, 8V1045, 8V1090

Operational conditions	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Ambient temperature during operation	5 to 40°C	5 to 40°C	5 to 40°C
Max. ambient temperature [1]	+55°C	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m	0 to 500 m
Maximum installation altitude [2]	2000 m	2000 m	2000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	II	II	II
EN 60529 protection	IP20	IP20	IP20

1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.

2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

Storage and transport conditions	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Storage temperature	-25 to +55°C	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C	95% at +40°C
Mechanical characteristics	**8V1022.00-2, 8V1022.001-2**	**8V1045.00-2, 8V1045.001-2**	**8V1090.00-2, 8V1090.001-2**
Dimensions			
Width	70.5 mm	70.5 mm	70.5 mm
Height	375 mm	375 mm	375 mm
Depth	235.5 mm	235.5 mm	235.5 mm
Weight	4.0 kg	4.1 kg	4.4 kg

Optional accessories		
8AC110.60-2	ACOPOS plug-in module, CAN interface	1290
8AC114.60-2	ACOPOS plug-in module, POWERLINK V2 interface	1291
8AC120.60-1	ACOPOS insert module, EnDat encoder and sine incremental encoder interface	1292
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	1294
8AC122.60-3	ACOPOS plug-in module, resolver interface	1296
8AC123.60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface	1298
8AC130.60-1	ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately	1300
8AC131.60-1	ACOPOS plug-in module, 2 analog inputs ±10V, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately	1303
8AC140.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately.	1306
8AC140.60-3	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately.	1306
8AC140.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately	1306
8AC141.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
8AC141.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
0PS320.1	24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	659
8CM005.12-1	Motor cable, length 5 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1314
8CM007.12-1	Motor cable, length 7 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1314
8CM010.12-1	Motor cable, length 10 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1314
8CM015.12-1	Motor cable, length 15 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1314
8CM020.12-1	Motor cable, length 20 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1314
8CM025.12-1	Motor cable, length 25 m, 4 x 1.5 mm² + 2 x 2 x 0.75 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1314

Servo drives
8V1180, 8V1320

8V1180.0xx-2

8V1320.0xx-2

- Modular mechanical structure using insert modules
- Integrated power filter
- Integrated or External braking resistor
- All connections made using plug-in connectors
- Integrated electronic restart inhibit

General information	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
C-UL-US listed	Yes	Yes
Power mains connection	**8V1180.00-2, 8V1180.001-2**	**8V1320.00-2, 8V1320.001-2**
Mains input voltage	3x 400 VAC to 480 VAC ±10% Power filter according to EN 61800-3-A11 second environment (Limits from CISPR11, Group 2, Class A)	3x 400 VAC to 480 VAC ±10% Power filter according to EN filter 61800-3-A11 second environment (Limits from CISPR11, Group 2, Class A)
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Installed load	Max. 17 kVA	Max. 30 kVA
Starting current at 400 VAC	13 A	13 A
Switch-on interval	> 10 sec	> 10 sec
Power loss at max. device power without Braking resistor	Approx. 500 W	Approx. 800 W
24 VDC supply	**8V1180.00-2, 8V1180.001-2**	**8V1320.00-2, 8V1320.001-2**
Input voltage	24 VDC +25% / -20%	24 VDC +25% / -20%
Input capacitance	40,000 µF	40,000 µF
Current requirements at 24 VDC [1]		
Mains input voltage applied	--- [2]	--- [2]
Mains input voltage not applied	Max. 2.8 A + current for motor holding brake + current on the 24 VDC output	Max. 2.8 A + current for motor holding brake + current on the 24 VDC output
DC bus power supply		
Switch-on voltage	455 VDC	455 VDC

1) The current requirements depend on the configuration of the ACOPOS servo drive.

2) If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is applied, the 24 VDC supply voltage for the ACOPOS servo drive is created by the internal DC bus power supply, which reduces the 24 VDC current requirements ($I_{24\ VDC}$) to 0.

24 VDC output	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Output voltage		
Mains input voltage applied	22 to 24 VDC	22 to 24 VDC
Mains input voltage not applied	16.7 to 30 VDC [1]	16.7 to 30 VDC [1]
Output current	Max. 0.5 A	Max. 0.5 A

1) If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is not applied, the voltage is created at the 24 VDC output from the ACOPOS servo drive's 24 VDC supply voltage; in this case it is between the maximum allowable and the minimum allowable (reduced by max. 2.5 V) 24 VDC supply voltage of the ACOPOS servo drive.

DC bus	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
DC bus capacitance	940 µF	1645 µF
Motor connector	**8V1180.00-2, 8V1180.001-2**	**8V1320.00-2, 8V1320.001-2**
Continuous current [1]	19 A_{eff}	34 A_{eff}
Reduction of continuous current depending on ambient temperature[2]		
Mains input voltage: 400 VAC		
Switching frequency 20 kHz	No reduction	0.61 A_{eff} per °C (from 40°C)
Switching frequency 10 kHz	**No reduction**	**No reduction**
Switching frequency 5 kHz	No reduction	No reduction
Mains input voltage: 480 VAC		
Switching frequency 20 kHz	No reduction	0.61 A_{eff} per °C (from 25°C)
Switching frequency 10 kHz	**No reduction**	**No reduction**
Switching frequency 5 kHz	No reduction	No reduction
Reduction of continuous current depending on installation altitude		
Starting at 500 m above sea level	1.9 A_{eff} per 1000 m	3.4 A_{eff} per 1000 m
Maximum current	50 A_{eff}	80 A_{eff}
Rated switching frequency	10 kHz	10 kHz
Maximum motor line length	25 m	25 m
Protective measures	Short circuit & overload protection	Short circuit & overload protection

1) Valid in the following conditions: Mains input voltage 400 VAC, nominal switching frequency, 40°C ambient temperature, installation altitudes < 500 m above sea level.

2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.

Motor holding brake connection	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Maximum output current	1.5 A	1.5 A
Max. number of switching cycles	Unlimited since done electronically	Unlimited since done electronically
Braking resistor	**8V1180.00-2, 8V1180.001-2**	**8V1320.00-2, 8V1320.001-2**
Peak power int. / ext.	14 / 40 kW	14 / 40 kW
Continuous power int. / ext.	0.4 / 8 kW [1]	0.4 / 8 kW [1]
Minimum braking resistance (ext.)	15 Ω	15 Ω
Rated current of the built-in fuse	10 A (fast-acting)	10 A (fast-acting)

1) Continuous power refers to the maximum breaking power the ACOPOS servo driver can yield 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 driver), and the value of the external braking resistance R_{BR}.

Trigger inputs	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Number of inputs	2	2
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA
Switching delay		
Positive edge	52 µs ± 0.5 µs (digitally filtered)	52 µs ± 0.5 µs (digitally filtered)
Negative edge	53 µs ± 0.5 µs (digitally filtered)	53 µs ± 0.5 µs (digitally filtered)
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V
Limit switch and reference inputs	**8V1180.00-2, 8V1180.001-2**	**8V1320.00-2, 8V1320.001-2**
Number of inputs	3	3
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 4 mA	Approx. 4 mA
Switching delay	Max. 2.0 ms	Max. 2.0 ms
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V

Enable input	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Number of inputs	1	1
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA
Switching delay		
Enable 1 -> 0, PWM off	Max. 2.0 ms	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 µs	Max. 100 µs
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V
Operational conditions	**8V1180.00-2, 8V1180.001-2**	**8V1320.00-2, 8V1320.001-2**
Environment temperature during operation[1)]	5 to 40°C	5 to 40°C
Max. ambient temperature	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m
Maximum installation altitude [2)]	2000 m	2000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	II	II
EN 60529 protection	IP20	IP20

1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.

2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

Storage and transport conditions	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C
Mechanical characteristics	**8V1180.00-2, 8V1180.001-2**	**8V1320.00-2, 8V1320.001-2**
Dimensions		
Width	200 mm	200 mm
Height	375 mm	375 mm
Depth	234 mm	234 mm
Weight	10.1 kg	10.6 kg

Optional accessories		
8AC110.60-2	ACOPOS plug-in module, CAN interface	1290
8AC114.60-2	ACOPOS plug-in module, POWERLINK V2 interface	1291
8AC120.60-1	ACOPOS insert module, EnDat encoder and sine incremental encoder interface	1292
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	1294
8AC122.60-3	ACOPOS plug-in module, resolver interface	1296
8AC123.60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface	1298
8AC130.60-1	ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately	1300
8AC131.60-1	ACOPOS plug-in module, 2 analog inputs ±10V, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately	1303
8AC140.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus-DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately	1306
8AC140.60-3	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately.	1306
8AC140.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately	1306
8AC141.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
8AC141.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
0PS320.1	24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	659
8CM005.12-3	Motor cable, length 5 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1315
8CM007.12-3	Motor cable, length 7 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1315
8CM010.12-3	Motor cable, length 10 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1315
8CM015.12-3	Motor cable, length 15 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1315
8CM020.12-3	Motor cable, length 20 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1315
8CM025.12-3	Motor cable, length 25 m, 4 x 4 mm² + 2 x 2 x 1 mm², motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1315

Servo drives
8V1640, 8V128M

8V1640.0xx-2

8V128M.0xx-2

- Modular mechanical structure using insert modules
- Integrated power filter
- Integrated or optional external braking resistor
- Integrated electronic restart inhibit

General information	**8V1640.00-2, 8V1640.001-2**	**8V128M.00-2, 8V128M.001-2**
C-UL-US listed	Yes	Yes
Power mains connection	**8V1640.00-2, 8V1640.001-2**	**8V128M.00-2, 8V128M.001-2**
Mains input voltage	3x 400 VAC to 480 VAC ±10% Power filter according to IEC 61800-3-A11 second environment (Limits from CISPR11, Group 2, Class A)	3x 400 VAC to 480 VAC ±10% Power filter according to IEC 61800-3-A11 second environment (Limits from CISPR11, Group 2, Class A)
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Installed load	Max. 54 kVA	Max. 98 kVA
Starting current at 400 VAC	26 A	26 A
Switch-on interval	> 10 sec	> 10 sec
Power loss at max. device power without braking resistor	Approx. 1600 W	Approx. 3200 W
24 VDC supply	**8V1640.00-2, 8V1640.001-2**	**8V128M.00-2, 8V128M.001-2**
Input voltage	24 VDC +25% / -20%	24 VDC +25% / -20%
Input capacitance	32800 µF	32800 µF
Current requirements at 24 VDC [1]		
Mains input voltage applied	--- [2]	--- [2]
Mains input voltage not applied	Max. 4.6 A + 1.4 * (current for motor holding brake + current on the 24 VDC output)	Max. 5.7 A + 1.4 * (current for the motor holding brake + current on the 24 VDC output)
DC bus power supply		
Switch-on voltage	455 VDC	455 VDC

1) The current requirements depend on the configuration of the ACOPOS servo drive.

2) If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is applied, the 24 VDC supply voltage for the ACOPOS servo drive is created by the internal DC bus power supply, which reduces the 24 VDC current requirements ($I_{24\ VDC}$) to 0.

24 VDC output	**8V1640.00-2, 8V1640.001-2**	**8V128M.00-2, 8V128M.001-2**
Output voltage		
Mains input voltage applied	22 to 24 VDC	22 to 24 VDC
Mains input voltage not applied	16.7 to 30 VDC [1]	16.7 to 30 VDC [1]
Output current	Max. 0.5 A	Max. 0.5 A

1) If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is not applied, the voltage is created at the 24 VDC output from the ACOPOS servo drive's 24 VDC supply voltage; in this case it is between the maximum allowable and the minimum allowable (reduced by max. 2.5 V) 24 VDC supply voltage of the ACOPOS servo drive.

DC bus	**8V1640.00-2, 8V1640.001-2**	**8V128M.00-2, 8V128M.001-2**
DC bus capacitance	3300 µF	6600 µF
Motor connector	**8V1640.00-2, 8V1640.001-2**	**8V128M.00-2, 8V128M.001-2**
Continuous current [1]	64 A_{eff}	128 A_{eff}
Reduction of continuous current depending on the ambient temperature [2]		
Mains input voltage: 400 VAC		
Switching frequency 20 kHz	0.96 A_{eff} per °C (from 25°C)	1.65 A_{eff} per °C (from 12°C)
Switching frequency 10 kHz	**No reduction**	1.65 A_{eff} per °C (from 52°C)
Switching frequency 5 kHz	No reduction	**No reduction**
Mains input voltage: 480 VAC		
Switching frequency 20 kHz	0.96 A_{eff} per °C (from 10°C)	1.65 A_{eff} per °C (from 10°C) [3]
Switching frequency 10 kHz	**0.96 A_{eff} per °C (from 50°C)**	1.65 A_{eff} per °C (from 36°C)
Switching frequency 5 kHz	No reduction	**No reduction**
Reduction of continuous current depending on installation altitude		
Starting at 500 m above sea level	6.4 A_{eff} per 1000 m	12.8 A_{eff} per 1000 m
Maximum current	200 A_{eff}	300 A_{eff}
Rated switching frequency	10 kHz	5 kHz
Maximum motor line length	25 m	25 m
Protective measures	Short circuit and overload protection	Short circuit and overload protection

1) Valid in the following conditions: Mains input voltage 400 VAC, nominal switching frequency, 40°C ambient temperature, installation altitudes < 500 m above sea level.

2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.

3) 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.

Motor holding brake connection	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Maximum output current	3 A	3 A
Max. number of switching cycles	Approx. 80,000	Approx. 80,000
Braking resistor	**8V1640.00-2, 8V1640.001-2**	**8V128M.00-2, 8V128M.001-2**
Peak power int. / ext.	7 / 250 kW	8.5 / 250 kW
Continuous power int. / ext.	0.2 / 24 kW [1]	0.24 / 24 kW [1]
Minimum braking resistance (ext.)	2.5 Ω	2.5 Ω
Rated current of the built-in fuse	30 A (fast-acting)	30 A (fast-acting)

1) Continuous power refers to the maximum breaking power the ACOPOS servo driver can yield 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 driver), and the value of the external braking resistance R_{BR}.

Trigger inputs	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Number of inputs	2	2
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA
Switching delay		
Positive edge	52 µs ± 0.5 µs (digitally filtered)	52 µs ± 0.5 µs (digitally filtered)
Negative edge	53 µs ± 0.5 µs (digitally filtered)	53 µs ± 0.5 µs (digitally filtered)
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V

Limit switch and reference inputs	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Number of inputs	3	3
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 4 mA	Approx. 4 mA
Switching delay	Max. 2.0 ms	Max. 2.0 ms
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V

Enable input	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Number of inputs	1	1
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA
Switching delay		
Enable 1 -> 0, PWM off	Max. 2.0 ms	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 µs	Max. 100 µs
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V
Operational conditions	**8V1640.00-2, 8V1640.001-2**	**8V128M.00-2, 8V128M.001-2**
Ambient temperature during operation	5 to 40°C	5 to 40°C
Max. ambient temperature [1]	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m
Maximum installation altitude [2]	2000 m	2000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	II	II
EN 60529 protection	IP20	IP20

1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.

2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

Storage and transport conditions	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C
Mechanical characteristics	**8V1640.00-2, 8V1640.001-2**	**8V128M.00-2, 8V128M.001-2**
Dimensions		
Width	276 mm	402 mm
Height	460 mm	460 mm
Depth	295 mm	295 mm
Weight	24.1 kg	33.8 kg

Optional accessories		
8AC110.60-2	ACOPOS plug-in module, CAN interface	1290
8AC114.60-2	ACOPOS plug-in module, POWERLINK V2 interface	1291
8AC120.60-1	ACOPOS insert module, EnDat encoder and sine incremental encoder interface	1292
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	1294
8AC122.60-3	ACOPOS plug-in module, resolver interface	1296
8AC123.60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface	1298
8AC130.60-1	ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately.	1300
8AC131.60-1	ACOPOS plug-in module, 2 analog inputs ±10V, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately	1303
8AC140.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus-DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately	1306
8AC140.60-3	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately.	1306
8AC140.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input ±10V, order program memory and 0TB708 terminal block separately	1306
8AC141.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
8AC141.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input ±10V, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
0PS320.1	24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	659
8CM005.12-5	Motor cable, length 5 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1316
8CM007.12-5	Motor cable, length 7 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1316
8CM010.12-5	Motor cable, length 10 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1316
8CM015.12-5	Motor cable, length 15 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1316
8CM020.12-5	Motor cable, length 20 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1316
8CM025.12-5	Motor cable, length 25 m, 4 x 10 mm² + 2 x 2 x 1.5 mm², motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1316

CAN bus interface
8AC110

- CAN interface for installation in ACOPOS servo drives
- For communication and configuration of the ACOPOS servo drives for standard applications
- Node number can be set using switch

General information	8AC110.60-2
C-UL-US listed	Yes
Module type	ACOPOS plug-in module
Slot	Slot 1
Power consumption	Max. 0.7 W
CAN bus interface	**8AC110.60-2**
Connection, module-side	9-pin DSUB plug
Indicators	RXD/TXD LEDs
Electrical isolation	
CAN bus - ACOPOS	Yes
Maximum distance	60 m
Baud rate	500 kBit/s
Network-capable	Yes
Bus termination resistor	Externally wired
Operational conditions	**8AC110.60-2**
Ambient temperature during operation	--- 1)
Relative humidity during operation	--- 1)
Storage and transport conditions	**8AC110.60-2**
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

CAN

Optional accessories		
7AC911.9	Bus connector, CAN	1724
0AC912.9	Bus adapter, CAN, 1 CAN bus interface	1726
0AC913.92	Bus adapter, CAN, 2 CAN bus interfaces, including 30 cm connection cable (DSUB connector)	1726

POWERLINK V2 interface
8AC114

- POWERLINK V2 interface for installation in ACOPOS servo drives
- Integrated 2x hub for easy wiring
- For communication and configuration of ACOPOS servo drives for complex and time-critical applications
- Node number can be set using switch

ETHERNET POWERLINK

General information	8AC114.60-2
C-UL-US listed	In preparation
Module type	ACOPOS plug-in module
Slot	Slot 1
Power consumption	Max. 3 W
POWERLINK interface	**8AC114.60-2**
Connection, module-side	2x RJ45 socket
Indicators	Status LED + 2x Link LED
Electrical isolation	
ETHERNET - ACOPOS	Yes
Maximum distance per segment	100 m [1]
Baud rate	100 Mbit/s
Network-capable	Yes
Hub, 2x	Yes
Maximum number of hub levels	10
Cabling topology	Star or tree with level 2 hubs
Possible station operating modes	Synchronous to POWERLINK cycle
Watchdog function	
Hardware	Yes (via ACOPOS servo drive)
Software	Yes (via ACOPOS servo drive)

1) With a cycle time of 400 µs and 10 ACOPOS servo drives, the maximum total cable length is 200 m.

Operational conditions	8AC114.60-2
Ambient temperature during operation	--- [1]
Relative humidity during operation	--- [1]

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

Storage and transport conditions	8AC114.60-2
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

Optional accessories	Amount		
X20CA0E61.xxxx	max. 2	EPL connection cable RJ45 to RJ45, xxxx m	1728

EnDat encoder and sine incremental encoder interface 8AC120

- EnDat encoder interface for installation in ACOPOS servo drives
- Encoder monitoring
- Also suitable for evaluating simple incremental encoders with sinusoidal input signal

General information	8AC120.60-1
C-UL-US listed	Yes
Module type	ACOPOS plug-in module
Slot [1]	Slots 2, 3 and 4
Power consumption	Depends on the encoder connected
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

1) The AC120 is an encoder module. Several encoder modules can also be inserted. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

Encoder input [1]	8AC120.60-1
Connection, module-side	15-pin DSUB socket
Indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOS	No
Encoder monitoring	Yes
Encoder supply	
Output voltage	Typ. 5 V
Ability to work under pressure	250 mA [2]
Sense lines	2, compensation of max. 2x 0.7 V
Sine-cosine inputs	
Signal transfer	Differential signals, symmetric
Differential voltage	0.5 to 1.25 V_{ss}
Common mode voltage	Max. ±7 V
Terminating resistor	120 Ω
Signal frequency (-5 dB)	DC up to 400 kHz
Signal frequency (-3 dB)	DC up to 300 kHz
Resolution [3]	16384 * number of encoder lines
Precision [4]	---
Reference input	
Signal transfer	Differential signal, symmetric
Differential voltage for high	≥ +0.2 V
Differential voltage for low	≤ -0.2 V
Common mode voltage	Max. ±7 V
Terminating resistor	120 Ω
Serial interface	Synchronous
Signal transfer	RS485
Baud rate	625 kBaud

1) The EnDat encoder must be wired using a cable with a single shield.

2) 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 is covers the consumption of the terminating resistors that 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.

3) Depending on the resolution of the connected encoder, in practical applications only a part of this resolution can be used. The usable resolution can be further reduced by signal interferences from the connected encoder.

4) In the field, the precision is limited by the encoder.

Operational conditions	8AC120.60-1
Ambient temperature during operation	--- [1]
Relative humidity during operation	--- [1]

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

Storage and transport conditions	8AC120.60-1
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

Optional accessories		
8CE005.12-1	EnDat cable, length 5 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed	1318
8CE007.12-1	EnDat cable, length 7 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed	1318
8CE010.12-1	EnDat cable, length 10 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed	1318
8CE015.12-1	EnDat cable, length 15 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed	1318
8CE020.12-1	EnDat cable, length 20 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed	1318
8CE025.12-1	EnDat cable, length 25 m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed	1318

HIPERFACE interface
8AC121

- HIPERFACE interface for installation in ACOPOS servo drives
- Encoder monitoring

General information	8AC121.60-1
C-UL-US listed	Yes
Module type	ACOPOS plug-in module
Slot [1]	Slots 2, 3 and 4
Power consumption	
With encoder current requirement of 0 mA	0.35 W
With encoder current requirement of 100 mA	1.4 W
With encoder current requirement of 170 mA	2.1 W

1) The AC121 is an encoder module. Several encoder modules can also be inserted. In this case, the module in the slot with the lowest number is automatically used for motor feedback.

Encoder input [1]	8AC121.60-1
Connection, module-side	15-pin DSUB socket, 2 pins closed
Indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOS	No
Encoder monitoring	Yes
Encoder supply	
Output voltage	8 - 9 V
Ability to work under pressure	170 mA
Sense lines	--- [2]
Sine-cosine inputs	
Signal transfer	Differential signal, asymmetric
Differential voltage	0.5 ... 1.25 Vss
Common mode voltage	Max. ±7 V
Terminating resistor	120 Ω
Signal frequency	DC ... 200 kHz
Resolution [3]	16384 * number of encoder lines
Precision [4]	---
Serial interface	Asynchronous
Signal transfer	RS485
Baud rate	9600 baud

1) The HIPERFACE encoder must be wired using a cable with a single shield.

2) No sense lines are present because the supply voltage for the HIPERFACE encoder is permitted to lie between 7 and 12 V.

3) Noise on the encoder signal reduces the practical resolution by approx. 5 bits (a factor of 32).

4) In the field, the precision is limited by the encoder.

Operational conditions	8AC121.60-1
Ambient temperature during operation	0 to +50°C
Relative humidity during operation	5 to 95%, non-condensing
Storage and transport conditions	**8AC121.60-1**
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

Resolver interface
8AC122

- Resolver interface for installation in ACOPOS servo drives
- Monitoring the encoder input signals
- Resolver type BRX

General information	8AC122.60-3
C-UL-US listed	Yes
Module type	ACOPOS plug-in module
Slot [1]	Slots 2, 3 and 4
Power consumption	Max. 2.5 W

1) The AC122 is an encoder module. Several encoder modules can also be inserted. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

Resolver input [1]	8AC122.60-3
Resolver type	BRX [2]
Number of poles	2-pin
Rated voltage ratio	0.5 ± 10%
Input frequency	10 kHz
Input voltage	3 to 7 V_{rms}
Max. phase shift	± 45°
Max. elec. angular error	± 10 angular minutes
Connection, module-side	9-pin DSUB socket
Indicators	UP/DN LEDs
Electrical isolation	
Resolver - ACOPOS	No
Encoder monitoring	Yes
Resolution	14 bits/rev [4]
Bandwidth	2.5 kHz
Accuracy	± 8 angular minutes
Reference output	
Signal transfer	Differential signals
Differential voltage	Typically 3.4 V_{eff}
Output current	Max. 50 mA_{eff}
Frequency	10 kHz
Sine-cosine inputs	
Signal transfer	Differential signals
Input impedance at 10 kHz (per pin)	10.4 kΩ - j 11.1 kΩ
Electrical isolation encoder-ACOPOS	No, common-mode voltage on the sine cosine inputs max ± 20 V

1) The resolver must be wired using a cable with a single shield and twisted pair signal lines.

2) BRX resolvers are fed with a sine signal (reference signal) from the module and return two sine signals with a 90° phase shift as a result. The amplitudes of these signals change 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.
Starting with firmware V2.040, BRT resolvers can be basically evaluated with 8AC122.60-3. However, resolution and precision are limited because the resolver is run in inverse mode. Additionally, the rated voltage ratio is different to 0.5 (default value) and has to be set appropriately.

3) Starting with firmware V2.040, the rated voltage ratio can be set in a range of 0.3 ... 0.5 (default value).

4) 12 bits/rev is set as default, but this can be changed to 14 bits/rev.

Operational conditions	8AC122.60-3
Ambient temperature during operation	--- [1]
Relative humidity during operation	--- [1]

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drives.

Storage and transport conditions	8AC122.60-3
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

Optional accessories		
8CR005.12-1	Resolver cable, length 5 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1319
8CR007.12-1	Resolver cable, length 7 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1319
8CR010.12-1	Resolver cable, length 10 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1319
8CR015.12-1	Resolver cable, length 15 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1319
8CR020.12-1	Resolver cable, length 20 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1319
8CR025.12-1	Resolver cable, length 25 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1319

Incremental encoder and SSI absolute value encoder interface 8AC123

- Incremental encoder and SSI absolute encoder interface for installing ACOPOS servo drives
- Monitoring the encoder input signals
- Encoder supply voltage of 5V or 15V
- Compensation for a voltage drop at 5 V encoder supply voltage

General information	8AC123.60-1
C-UL-US listed	Yes
Module type	ACOPOS plug-in module
Slot [1]	Slots 2, 3 and 4
Power consumption	Max. 7.5 W
	Depends on the current requirements for the encoder connected [2]

1) The AC123 is an encoder module. Several encoder modules can also be inserted. 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_{Module} [W] = $P_{Encoder}$ [W] . k + 0.6 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:

$P_{Encoder}$ [W] = $U_{Encoder}$ [V] . $I_{Encoder}$ [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)

Encoder input [1]	8AC123.60-1
Connection, module-side	15-pin DSUB socket
Indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOS	Yes
Encoder monitoring	Yes
Signal transfer	Differential signal transfer
Cable length [2]	Max. 50 m

1) The encoder must be wired using a cable with a single shield and twisted pair signal lines (e.g. 4 x 2 x 0.14 mm² + 2 x 0.5 mm²).

2) A cable with at least 4 x 2 x 0.14 mm² + 2 x 0.5 mm² is required for the maximum cable length. The sense lines must be used.

Encoder supply	8AC123.60-1
Supply voltages	Internal, select between 5 V/15 V
Sense lines	
For 5 V	Yes, 2, compensation of max. 2 V
For 15 V	No
Ability to work under pressure	
5 V	350 mA
15 V	350 mA
Short circuit protection, overload protection	Yes

Incremental encoder	8AC123.60-1
Signal form	Square wave pulse
Evaluation	4x
Input frequency	Max. 200 kHz
Counter frequency	Max. 800 kHz
Reference frequency	Max. 200 kHz
Distance between edges	Min. 0.6 µs
Counter size	32-bit
Inputs	A, A\, B, B\, R, R\
Differential voltage inputs A, B, R	
Minimum	2.5 V
Maximum	6 V

SSI absolute encoder	8AC123.60-1
Coding	Gray, binary
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
Operational conditions	**8AC123.60-1**
Ambient temperature during operation	--- [1]
Relative humidity during operation	--- [1]

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

Storage and transport conditions	8AC123.60-1
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

Digital mixed module
8AC130

- Digital mixed module for installation in ACOPOS servo drives
- Maximum of 8 digital inputs or 10 digital outputs
- The I/O points can be configured in pairs as inputs or outputs
- Incremental encoder functionality (A, B, R)
- Incremental encoder emulation

General information	8AC130.60-1
C-UL-US listed	Yes
Module type	ACOPOS plug-in module
Slot [1]	Slots 2, 3 and 4
Power consumption	Max. 0.8 W

1) The AC130 can also be used as an encoder module. Several encoder modules can also be inserted. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

Inputs/outputs	8AC130.60-1
Connection, module-side	12-pin connector
Configuration of the inputs/outputs	Configured in pairs as input or output
Display	24 V LED

Supply voltage	8AC130.60-1
Supply voltage	
Minimum	18 VDC
Rated	24 VDC
Maximum	30 VDC
Reverse polarity protection	Yes
Voltage monitoring (24 V - LED)	Yes, supply voltage > 18 V

Digital inputs [1]	8AC130.60-1
Number of inputs	Max. 8
Wiring	Sink
Electrical isolation	
Input - ACOPOS	Yes
Input - Input	No
Input voltage	
Rated	24 VDC
Maximum	30 VDC
Switching threshold	
LOW	< 5 V
HIGH	>15 V
Input current at rated voltage	
Inputs 1 - 4	Approx. 10 mA
Inputs 5 - 8	Approx. 5.5 mA
Switching delay	
Inputs 1 - 4	Max. 5 µs
Inputs 5 - 8	Max. 35 µs
Modulation compared to ground potential	---

1) Shielded cables must be used for inputs 1 - 4.

Event counter	8AC130.60-1
Signal form	Square wave pulse
Input frequency	Max. 100 kHz
Counter size	16-bit
Inputs	
Input 1	Counter 1
Input 2	Counter 2

Incremental encoder	8AC130.60-1
Signal form	Square wave pulse
Evaluation	4x
Encoder monitoring	No
Input frequency	Max. 62.5 kHz
Counter frequency	Max. 250 kHz
Reference frequency	Max. 62.5 kHz
Distance between edges	Min. 2.5 µs
Counter size	16-bit
Inputs	
Input 1	Channel A
Input 2	Channel B
Input 3	Reference pulse R
Outputs	**8AC130.60-1**
Number of outputs	Max. 10
Type	Transistor outputs
Outputs 1 - 4	Push-pull
Outputs 5 - 10	High-side
Electrical isolation	
Output - ACOPOS	Yes
Output - Output	No
Switching voltage	
Minimum	18 VDC
Rated	24 VDC
Maximum	30 VDC
Continuous current	
Outputs 1 - 4	Max. 100 mA
Outputs 5 - 8	Max. 400 mA
Outputs 9 - 10	Max. 2 A
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
Switching frequency (resistive load)	
Outputs 1 - 2	Max. 10 kHz
Outputs 3 - 4	Max. 10 kHz
Outputs 5 - 8	Max. 5 kHz
Outputs 9 - 10	Max. 100 Hz
Protection	
Short circuit protection	Yes
Overload protection	Yes
Short circuit current at 24 V (until cut-off)	
Outputs 1 - 4	Approx. 1 A
Outputs 5 - 8	Approx. 1.2 A
Outputs 9 - 10	Approx. 24 A
Readable outputs	Yes

Digital mixed module
8AC130

Operational conditions	8AC130.60-1
Ambient temperature during operation	--- [1]
Relative humidity during operation	--- [1]

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

Storage and transport conditions	8AC130.60-1
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

Required accessories		
7TB712.9	Terminal block, 12-pin, screw clamps	1721
7TB712.91	Terminal block, 12-pin, cage clamps	1721

Mixed module 8AC131

- Mixed module for installation in ACOPOS servo drives
- 2 analog inputs with 12-bit resolution and up to 2 digital inputs/outputs
- Digital inputs/outputs can be switched individually
- Counter function
- All digital outputs can be read

General information	**8AC131.60-1**
C-UL-US listed	Yes
Module type	ACOPOS plug-in module
Slot	Slots 2, 3 and 4
Power consumption	Max. 1 W
Inputs/outputs	**8AC131.60-1**
Connection, module-side	12-pin connector
Configuration of the digital inputs/outputs	Can be configured individually as digital input or output
Display	24 V LED
Supply voltage	**8AC131.60-1**
Supply voltage	
Minimum	18 VDC
Rated	24 VDC
Maximum	30 VDC
Reverse polarity protection	Yes
Voltage monitoring (24 V - LED)	Yes, supply voltage > 18 V
Digital inputs	**8AC131.60-1**
Number of inputs	Max. 2
Wiring	Sink
Electrical isolation	
Input - ACOPOS	Yes
Input - Input	No
Input voltage	
Rated	24 VDC
Maximum	30 VDC
Switching threshold	
LOW	< 5 V
HIGH	>15 V
Input current at rated voltage	Approx. 8 mA
Switching delay	
Counter	Max. 5 µs
Digital input	Max. 55 µs (digitally filtered)
Modulation compared to ground potential	Max. ±50 V
Event counter	**8AC131.60-1**
Signal form	Square wave pulse
Input frequency	Max. 100 kHz
Counter size	16-bit
Inputs	
Input 1	Counter 1
Input 2	Counter 2

Mixed module
8AC131

Digital outputs	8AC131.60-1
Number of outputs	Max. 2
Type	Transistor outputs push-pull
Electrical isolation	
Output - ACOPOS	Yes
Output - Output	No
Switching voltage	
Minimum	18 VDC
Rated	24 VDC
Maximum	30 VDC
Continuous current	Max. 45 mA
Switching delay 0 -> 1 and 1 -> 0	Max. 5 µs
Switching frequency (resistive load)	Max. 100 kHz
Protection	
Short circuit protection	Yes
Overload protection	Yes
Short circuit current at 24 V (until cut-off)	Approx. 0.3 A
Readable outputs	Yes
Analog inputs	**8AC131.60-1**
Number of inputs	Max. 2
Design	Differential input or single ended input
Electrical isolation	
Input - ACOPOS	Yes
Input - Input	No
Input signal	
Rated	-10 V to +10 V
Maximum	-15 V to +15 V
Operating mode	Cyclic measurement synchronous to 50 µs ACOPOS clock
Digital converter resolution	12-bit
Non-linearity	±1 LSB
Output format	INT16 $8000 - $7FF0 LSB = $0010 = 4.883 mV
Conversion procedure	Successive approximation
Conversion time for both inputs	<50 µs
Differential input impedance	> 10 MΩ
Input filter	Analog low pass 3rd order / cut-off frequency: 10 kHz
Basic Accuracy at 25°C	Refers to the measurement range limit. ±0.05% [1]
Offset drift	Max. ±0.0005% / °C [1]
Gain drift	Max. ±0.006% / °C [1]
Cross-talk between the analog inputs	Min. -90 dB at 1kHz
Common-mode rejection	
DC	Min. -73 dB
50 Hz	Min. -73 dB
Modulation compared to ground potential	Max. ±50 V
Modulation between the analog input channels	Max. ±5 V

1) Refers to the measurement range limit.

Operational conditions	8AC131.60-1
Ambient temperature during operation	--- [1]
Relative humidity during operation	--- [1]

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

Storage and transport conditions	8AC131.60-1
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

Required accessories		
7TB712.9	Terminal block, 12-pin, screw clamps	1721
7TB712.91	Terminal block, 12-pin, cage clamps	1721

CPU module
8AC140

8AC140.60-2

8AC140.61-2

- Complete PLC for installation in ACOPOS servo drives
- Removable application memory (CompactFlash) [1]
- Interfaces for connecting to CAN bus, Profibus or Ethernet networks [2]
- Integrated analog input and up to three digital inputs/outputs (can be configured individually as input/output)
- Can be delivered with built-in CNC function (ARNC0, only on 8AC140.61-3)

1) Application memory must be ordered separately.

2) Ethernet interface only on 8AC140.60-3 and 8AC140.61-3.

General information	8AC140.60-2	8AC140.60-3	8AC140.61-3
C-UL-US listed	Yes	Yes	Yes
Module type	ACOPOS plug-in module double-width	ACOPOS plug-in module double-width	ACOPOS plug-in module double-width
Slot [1]	Slots 1 + 2	Slots 1 + 2	Slots 1 + 2
Power consumption	Max. 4.5 W	Max. 4.5 W	Max. 4.5 W
Visual Components capability	Yes	Yes	Yes
ACOPOS capability	Yes		Yes

1) The AC140 is a module with double-width and occupies slots 1 and 2.

CPU	8AC140.60-2	8AC140.60-3	8AC140.61-3
Processor clock	100 MHz	100 MHz	100 MHz
SRAM	32 kB	32 kB	32 kB
DRAM	16 MB	32 MB	32 MB
Operating system	AC140 (version V2.67 and higher)	AC140 (version V2.67 and higher)	AC140 (version V2.67 and higher)
IF1 application interface	**8AC140.60-2**	**8AC140.60-3**	**8AC140.61-3**
Interface type	RS232	RS232	RS232
Electrical isolation	No	No	No
Design	9-pin DSUB plug	9-pin DSUB plug	9-pin DSUB plug
Max. distance	15 m / 19,200 baud	15 m / 19,200 baud	15 m / 19,200 baud
Max. baud rate	115.2 kBaud	115.2 kBaud	115.2 kBaud
Display	X1 LED	X1 LED	X1 LED
IF2 application interface	**8AC140.60-2**	**8AC140.60-3**	**8AC140.61-3**
Interface type	CAN bus	CAN bus	CAN bus
Electrical isolation	Yes	Yes	Yes
Design	9-pin DSUB plug	9-pin DSUB plug	9-pin DSUB plug
Max. distance	1000 m	1000 m	1000 m
Max. baud rate			
Bus lengths up to 60 m	500 kBit/s	500 kBit/s	500 kBit/s
Bus lengths up to 200 m	250 kBit/s	250 kBit/s	250 kBit/s
Bus lengths up to 1,000 m	50 kBit/s	50 kBit/s	50 kBit/s
Indicators	RX / TX LEDs	RX / TX LEDs	RX / TX LEDs
Network-capable	Yes	Yes	Yes
Bus termination resistor	Externally wired	Externally wired	Externally wired
IF3 application interface	**8AC140.60-2**	**8AC140.60-3**	**8AC140.61-3**
Interface type	RS485	RS485	RS485
Transfer protocol	Profibus DP	Profibus DP	Profibus DP
Electrical isolation	Yes	Yes	Yes
Design	9-pin DSUB socket	9-pin DSUB socket	9-pin DSUB socket
Controller	ASIC SPC3	ASIC SPC3	ASIC SPC3
RAM	1.5 kByte	1.5 kByte	1.5 kByte
Max. distance	1000 m	1000 m	1000 m
Max. baud rate			
Bus lengths up to 100 m	12 MBit/s	12 MBit/s	12 MBit/s
Bus lengths up to 200 m	1.5 MBit/s	1.5 MBit/s	1.5 MBit/s
Bus lengths up to 400 m	500 kBit/s	500 kBit/s	500 kBit/s
Bus lengths up to 1,000 m	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s
Indicators	RX / TX LEDs	PB LED	PB LED
Network-capable	Yes	Yes	Yes
Bus termination resistor	External T-connector	External T-connector	External T-connector

Application interface IF5	8AC140.60-2	8AC140.60-3	8AC140.61-3
Interface type	---	Ethernet	Ethernet
Electrical isolation	---	Yes	Yes
Design	---	RJ45 socket	RJ45 socket
Max. distance	---	100 m	100 m
Baud rate	---	10/100 MBit/s	10/100 MBit/s
Display	---	ACT LED	ACT LED
Network-capable	---	Yes	Yes
Inputs/outputs	**8AC140.60-2**	**8AC140.60-3**	**8AC140.61-3**
Connection, module-side	8-pin connector	8-pin connector	8-pin connector
Configuration of the digital inputs/outputs	Can be configured individually as input or output	Can be configured individually as input or output	Can be configured individually as input or output
Digital inputs [1)]	**8AC140.60-2**	**8AC140.60-3**	**8AC140.61-3**
Number of inputs	Max. 3	Max. 3	Max. 3
Wiring	Sink	Sink	Sink
Electrical isolation			
Input - ACOPOS	Yes	Yes	Yes
Input - Input	No	No	No
Input voltage			
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	>15 V	>15 V	>15 V
Input current at rated voltage	Approx. 4.2 mA	Approx. 4.2 mA	Approx. 4.2 mA
Input delay	<5 µs	<5 µs	<5 µs
Modulation compared to ground potential	Max. ±30 V	Max. ±30 V	Max. ±30 V

1) Shielded cables must be used for inputs 1 - 3.

Event counter	8AC140.60-2	8AC140.60-3	8AC140.61-3
Signal form	Square wave pulse	Square wave pulse	Square wave pulse
Input frequency	Max. 100 kHz	Max. 100 kHz	Max. 100 kHz
Pulse length	Min. 5 µs	Min. 5 µs	Min. 5 µs
Counter size	32-bit	32-bit	32-bit
Inputs			
Input 1	Counter 1	Counter 1	Counter 1
Input 2	---	---	---
Input 3	---	---	---
Incremental counter	**8AC140.60-2**	**8AC140.60-3**	**8AC140.61-3**
Signal form	Square wave pulse	Square wave pulse	Square wave pulse
Evaluation	4x	4x	4x
Encoder monitoring	No	No	No
Input frequency	Max. 20 kHz	Max. 20 kHz	Max. 20 kHz
Counter frequency	Max. 80 kHz	Max. 80 kHz	Max. 80 kHz
Reference frequency	Max. 20 kHz	Max. 20 kHz	Max. 20 kHz
Distance between edges	Min. 5 µs	Min. 5 µs	Min. 5 µs
Counter size	16-bit	16-bit	16-bit
Inputs			
Input 1	Channel A	Channel A	Channel A
Input 2	Channel B	Channel B	Channel B
Input 3	Reference pulse R	Reference pulse R	Reference pulse R

CPU module
8AC140

Gate measurement	8AC140.60-2	8AC140.60-3	8AC140.61-3
Signal form	Square wave pulse	Square wave pulse	Square wave pulse
Gate frequency	Max. 100 kHz	Max. 100 kHz	Max. 100 kHz
Pulse length	Min. 5 µs	Min. 5 µs	Min. 5 µs
Counter frequency			
Internal	31.25 kHz or 4 MHz	31.25 kHz or 4 MHz	31.25 kHz or 4 MHz
External	Max. 100 kHz	Max. 100 kHz	Max. 100 kHz
Period measurement	**8AC140.60-2**	**8AC140.60-3**	**8AC140.61-3**
Signal form	Square wave pulse	Square wave pulse	Square wave pulse
Input frequency	Max. 100 kHz	Max. 100 kHz	Max. 100 kHz
Pulse length	Min. 5 µs	Min. 5 µs	Min. 5 µs
Counter frequency			
Internal	31.25 kHz or 4 MHz	31.25 kHz or 4 MHz	31.25 kHz or 4 MHz
External	Max. 100 kHz	Max. 100 kHz	Max. 100 kHz
Digital outputs	**8AC140.60-2**	**8AC140.60-3**	**8AC140.61-3**
Number of outputs	Max. 3	Max. 3	Max. 3
Type	High-side transistor outputs	High-side transistor outputs	High-side transistor outputs
Electrical isolation			
Output - ACOPOS	Yes	Yes	Yes
Output - Output	No	No	No
Switching voltage			
Minimum	18 VDC	18 VDC	18 VDC
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Continuous current	Max. 500 mA	Max. 500 mA	Max. 500 mA
Switching delay 0 -> 1 and 1 -> 0	Max. 500 µs (typ. 250 µs)	Max. 500 µs (typ. 250 µs)	Max. 500 µs (typ. 250 µs)
Switching frequency (resistive load)	Max. 100 Hz	Max. 100 Hz	Max. 100 Hz
Protection			
Short circuit protection	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes
Continuous short circuit current at 24 V	Typ. 4 A	Typ. 4 A	Typ. 4 A
Readable outputs	Yes	Yes	Yes
Analog input	**8AC140.60-2**	**8AC140.60-3**	**8AC140.61-3**
Design	Differential input	Differential input	Differential input
Electrical isolation			
Input - ACOPOS [1)]	No, max. modulation: ±13 V	No, max. modulation: ±13 V	No, max. modulation: ±13 V
Input signal			
Rated	-10 V to +10 V	-10 V to +10 V	-10 V to +10 V
Maximum	-13 V to +13 V	-13 V to +13 V	-13 V to +13 V
Operating mode	Cyclic measurement non-synchronous to 50 µs ACOPOS clock	Cyclic measurement non-synchronous to 50 µs ACOPOS clock	Cyclic measurement non-synchronous to 50 µs ACOPOS clock
Digital converter resolution	12-bit	12-bit	12-bit
Non-linearity	±2 LSB	±2 LSB	±2 LSB
Output format	INT 16 $8001 - $7FFF LSB = $0010 = 4.88 mV	INT 16 $8001 - $7FFF LSB = $0010 = 4.88 mV	INT 16 $8001 - $7FFF LSB = $0010 = 4.88 mV
Conversion procedure	Successive approximation	Successive approximation	Successive approximation
Conversion time	<50 µs	<50 µs	<50 µs
Differential input impedance	20 MΩ	20 MΩ	20 MΩ
Input filter	Analog low pass 3rd-order cut-off frequency: 10 kHz	Analog low pass 3rd-order cut-off frequency: 10 kHz	Analog low pass 3rd-order cut-off frequency: 10 kHz
Common-mode rejection			
DC	Min. 73 dB	Min. 73 dB	Min. 73 dB
50 Hz	Min. 73 dB	Min. 73 dB	Min. 73 dB

1) External electrical isolation for the connected sensors is recommended because the analog input is not electrically isolated.

Operational conditions	8AC140.60-2	8AC140.60-3	8AC140.61-3
Ambient temperature during operation	--- [1]	--- [1]	--- [1]
Relative humidity during operation	--- [1]	--- [1]	--- [1]

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective for a list of exclusive actions.

Storage and transport conditions	8AC140.60-2	8AC140.60-3	8AC140.61-3
Storage temperature	-25 to +55°C	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C	95% at +40°C

Required accessories		
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems	1706
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems	1706
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems	1706
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems	1706
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems	1706
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems	1706
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems	1706
5CFCRD.8092-03	CompactFlash 8092 MB ATA/IDE SiliconSystems	1706
0TB708.91	Accessory terminal block, 8-pin, cage clamps 1.5 mm²	1716

Optional accessories		
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	1708
7AC911.9	Bus connector, CAN	1724
0AC912.9	Bus connector, CAN, 1 CAN interface	1726
0AC913.92	Bus connecter, CAN, 2 CAN interfaces, including 30 cm connection cable (DSUB connector)	1726

CPU module
8AC141

- Complete PLC for installation in ACOPOS servo drives
- Removable application memory (CompactFlash) [1)]
- Interfaces for connecting to CAN bus or Ethernet networks
- X2X Link interface
- Up to three digital inputs/outputs (can be configured individually as input / output)
- With built-in CNC function (ARNC0, only on 8AC141.61-3)

1) Application memory must be ordered separately.

General information	8AC141.60-2	8AC141.61-3
C-UL-US listed	Yes	Yes
Module type	ACOPOS plug-in module double-width	ACOPOS plug-in module double-width
Slot [1)]	Slots 1 + 2	Slots 1 + 2
Power consumption	Max. 4.5 W	Max. 4.5 W
Visual Components capability	Yes	Yes
ACOPOS capability	Yes	Yes

1) The AC141 is a module with double-width and occupies slots 1 and 2.

CPU	8AC141.60-2	8AC141.61-3
Processor clock	100 MHz	100 MHz
SRAM	32 kB	32 kB
DRAM	16 MB	32 MB
Operating system	AC140 (version V2.80 and higher)	AC140 (version V2.80 and higher)
IF1 application interface	**8AC141.60-2**	**8AC141.61-3**
Interface type	RS232	RS232
Electrical isolation	No	No
Design	9-pin DSUB plug	9-pin DSUB plug
Max. distance	15 m / 19,200 baud	15 m / 19,200 baud
Max. baud rate	115.2 kBaud	115.2 kBaud
Display	232 LED	232 LED
Application interfaces IF2, IF3	**8AC141.60-2**	**8AC141.61-3**
Interface type	CAN bus	CAN bus
Electrical isolation	Yes	Yes
Design	9-pin DSUB plug	9-pin DSUB plug
Max. distance	1000 m	1000 m
Max. baud rate		
Bus lengths up to 60 m	500 kBit/s	500 kBit/s
Bus lengths up to 200 m	250 kBit/s	250 kBit/s
Bus lengths up to 1,000 m	50 kBit/s	50 kBit/s
Indicators		
IF2	CAN1 LED	CAN1 LED
IF3	CAN2 LED	CAN2 LED
Network-capable	Yes	Yes
Bus termination resistor	Externally wired	Externally wired
IF4 application interface	**8AC141.60-2**	**8AC141.61-3**
Interface type	X2X	X2X
Electrical isolation	Yes	Yes
Design	4-pin connector	4-pin connector
Max. distance	100 m	100 m
Indicators	X2X LED	X2X LED
Application interface IF6	**8AC141.60-2**	**8AC141.61-3**
Interface type	Ethernet	Ethernet
Electrical isolation	Yes	Yes
Design	RJ45 socket	RJ45 socket
Max. distance	100 m	100 m
Baud rate	10/100 MBit/s	10/100 MBit/s
Display	ACT LED	ACT LED
Network-capable	Yes	Yes

Inputs/outputs	8AC141.60-2	8AC141.61-3
Connection, module-side	8-pin connector	8-pin connector
Configuration of the digital inputs/outputs	Can be configured individually as input or output	Can be configured individually as input or output
Digital inputs [1]	**8AC141.60-2**	**8AC141.61-3**
Number of inputs	Max. 3	Max. 3
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 4.2 mA	Approx. 4.2 mA
Input delay	<5 µs	<5 µs
Modulation compared to ground potential	Max. ±30 V	Max. ±30 V

1) Shielded cables must be used for inputs 1 - 3.

Event counter	8AC141.60-2	8AC141.61-3
Signal form	Square wave pulse	Square wave pulse
Input frequency	Max. 100 kHz	Max. 100 kHz
Pulse length	Min. 5 µs	Min. 5 µs
Counter size	32-bit	32-bit
Inputs		
Input 1	Counter 1	Counter 1
Input 2	Count direction (only in stepper motor mode)	Count direction (only in stepper motor mode)
Input 3	---	---
Incremental counter	**8AC141.60-2**	**8AC141.61-3**
Signal form	Square wave pulse	Square wave pulse
Evaluation	4x	4x
Encoder monitoring	No	No
Input frequency	Max. 20 kHz	Max. 20 kHz
Counter frequency	Max. 80 kHz	Max. 80 kHz
Reference frequency	Max. 20 kHz	Max. 20 kHz
Distance between edges	Min. 5 µs	Min. 5 µs
Counter size	16-bit	16-bit
Inputs		
Input 1	Channel A	Channel A
Input 2	Channel B	Channel B
Input 3	Reference pulse R	Reference pulse R
Gate measurement	**8AC141.60-2**	**8AC141.61-3**
Signal form	Square wave pulse	Square wave pulse
Gate frequency	Max. 100 kHz	Max. 100 kHz
Pulse length	Min. 5 µs	Min. 5 µs
Counter frequency		
Internal	31.25 kHz or 4 MHz	31.25 kHz or 4 MHz
External	Max. 100 kHz	Max. 100 kHz
Period measurement	**8AC141.60-2**	**8AC141.61-3**
Signal form	Square wave pulse	Square wave pulse
Input frequency	Max. 100 kHz	Max. 100 kHz
Pulse length	Min. 5 µs	Min. 5 µs
Counter frequency		
Internal	31.25 kHz or 4 MHz	31.25 kHz or 4 MHz
External	Max. 100 kHz	Max. 100 kHz

CPU module
8AC141

Digital outputs	8AC141.60-2	8AC141.61-3
Number of outputs	Max. 3	Max. 3
Type	High-side transistor outputs	High-side transistor outputs
Electrical isolation		
Output - ACOPOS	Yes	Yes
Output - Output	No	No
Switching voltage		
Minimum	18 VDC	18 VDC
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Continuous current	Max. 500 mA	Max. 500 mA
Switching delay 0 -> 1 and 1 -> 0	Max. 500 µs (typ. 250 µs)	Max. 500 µs (typ. 250 µs)
Switching frequency (resistive load)	Max. 100 Hz	Max. 100 Hz
Protection		
Short circuit protection	Yes	Yes
Overload protection	Yes	Yes
Continuous short circuit current at 24 V	Typ. 4 A	Typ. 4 A
Readable outputs	Yes	Yes

Analog input	8AC141.60-2	8AC141.61-3
Design	Differential input	Differential input
Electrical isolation		
Input - ACOPOS [1]	No, max. modulation: ±13 V	No, max. modulation: ±13 V
Input signal		
Rated	-10 V to +10 V	-10 V to +10 V
Maximum	-13 V to +13 V	-13 V to +13 V
Operating mode	Cyclic measurement, non-synchronous to 50 µs ACOPOS clock	Cyclic measurement, non-synchronous to 50 µs ACOPOS clock
Digital converter resolution	12-bit	12-bit
Non-linearity	±2 LSB	±2 LSB
Output format	INT 16 $8001 - $7FFF LSB = $0010 = 4.88 mV	INT 16 $8001 - $7FFF LSB = $0010 = 4.88 mV
Conversion procedure	Successive approximation	Successive approximation
Conversion time	<50 µs	<50 µs
Differential input impedance	20 MΩ	20 MΩ
Input filter	Analog low pass 3rd-order cut-off frequency: 10 kHz	Analog low pass 3rd-order cut-off frequency: 10 kHz
Common-mode rejection		
DC	Min. 73 dB	Min. 73 dB
50 Hz	Min. 73 dB	Min. 73 dB

1) External electrical isolation for the connected sensors is recommended because the analog input is not electrically isolated.

Operational conditions	8AC141.60-2	8AC141.61-3
Ambient temperature during operation	--- [1]	--- [1]
Relative humidity during operation	--- [1]	--- [1]

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective for a list of exclusive actions.

Storage and transport conditions	8AC141.60-2	8AC141.61-3
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C

Required accessories		
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems	1706
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems	1706
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems	1706
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems	1706
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems	1706
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems	1706
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems	1706
5CFCRD.8092-03	CompactFlash 8092 MB ATA/IDE SiliconSystems	1706
0TB708.91	Accessory terminal block, 8-pin, cage clamps 1.5 mm²	1716
0TB704.9	Accessory terminal block, 4-pin, screw clamp 1.5 mm²	1714
0TB704.91	Accessory terminal block, 4-pin, cage clamps 2.5 mm²	1714

Optional accessories		
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	1708
7AC911.9	Bus connector, CAN	1724
0AC912.9	Bus connector, CAN, 1 CAN interface	1726
0AC913.92	Bus connecter, CAN, 2 CAN interfaces, including 30 cm connection cable	1726

Motor cables 1.5 mm²
8CM

- UL/CSA listed
- Can be used in cable drag chains
- Optimally produced for use with ACOPOS servo drives 1010/1016/1022/1045/1090 and B&R servo motors with size 1 motor plugs

Available from production in six different lengths: [1)]

Cable length	Model number
5 m	8CM005.12-1
7 m	8CM007.12-1
10 m	8CM010.12-1
15 m	8CM015.12-1
20 m	8CM020.12-1
25 m	8CM025.12-1

1) Custom fabrications are available upon request.

General information	8CMxxx.12-1
Cable cross section	4 x 1.5 mm² + 2 x 2 x 0.75 mm²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Lines	**8CMxxx.12-1**
Power lines	1.5 mm², tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Signal lines	0.75 mm², tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, white/red, white/blue, white/green
Cable structure	**8CMxxx.12-1**
Power lines	
Stranding	No
Shield	No
Signal lines	
Stranding	White with white/red and white/blue with white/green
Shield	Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER & RAINER 4x1.5+2x2x0.75 FLEX
Electrical characteristics	**8CMxxx.12-1**
Conductor resistance	
Power lines	≤ 14 Ω/km
Signal lines	≤ 19 Ω/km
Insulation resistance	> 200 Ω/km
Test voltage	
Wire/wire	3 kV
Wire/shield	3 kV
Operating voltage	Max. 1000 V
Mechanical characteristics	**8CMxxx.12-1**
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	12.8 mm ± 0.4 mm
Flex radius	>96 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s²
Flex cycles	≥ 3,000,000
Weight	0.26 kg/m

Motor cables 4 mm²
8CM

- UL/CSA certified
- Can be used in cable drag chains
- Produced for optimal use with ACOPOS servo drives 1180/1320 and B&R servo motors with size 1 motor plugs

Available from production in six different lengths: [1)]

Cable length	Model number
5 m	8CM005.12-3
7 m	8CM007.12-3
10 m	8CM010.12-3
15 m	8CM015.12-3
20 m	8CM020.12-3
25 m	8CM025.12-3

1) Custom fabrications are available upon request.

General information	8CMxxx.12-3
Cable cross section	4 x 4 mm² + 2 x 2 x 1 mm²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Lines	**8CMxxx.12-3**
Power lines	4 mm², tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Signal lines	1 mm², tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, white/red, white/blue, white/green
Cable structure	**8CMxxx.12-3**
Power lines	
Stranding	No
Shield	No
Signal lines	
Stranding	White with white/red and white/blue with white/green
Shield	Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER & RAINER 4x4.0+2x2x1.0 FLEX
Electrical characteristics	**8CMxxx.12-3**
Conductor resistance	
Power lines	≤ 5.2 Ω/km
Signal lines	≤ 19 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	3 kV
Wire/shield	3 kV
Operating voltage	Max. 1000 V
Mechanical characteristics	**8CMxxx.12-3**
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	15.8 mm ± 0.5 mm
Flex radius	>118.5 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s²
Flex cycles	≥ 3,000,000
Weight	0.45 kg/m

Motor cables 10 mm²
8CM

- UL/CSA certified
- Can be used in cable drag chains
- Optimally produced for use with ACOPOS servo drives 1640/128M and B&R servo motors with size 1.5 motor plugs

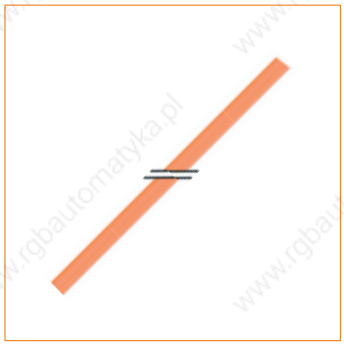
Available from production in six different lengths: [1]

Cable length	Model number
5 m	8CM005.12-5
7 m	8CM007.12-5
10 m	8CM010.12-5
15 m	8CM015.12-5
20 m	8CM020.12-5
25 m	8CM025.12-5

1) Custom fabrications are available upon request.

General information	8CMxxx.12-5
Cable cross section	4 x 10 mm² + 2 x 2 x 1.5 mm²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Lines	**8CMxxx.12-5**
Power lines	10 mm², tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Signal lines	1.5 mm², tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, white/red, white/blue, white/green
Cable structure	**8CMxxx.12-5**
Power lines	
Stranding	No
Shield	No
Signal lines	
Stranding	White with white/red and white/blue with white/green
Shield	Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER & RAINER 4x10.0+2x2x1.5 FLEX
Electrical characteristics	**8CMxxx.12-5**
Conductor resistance	
Power lines	≤ 2.1 Ω/km
Signal lines	≤ 14 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	3 kV
Wire/shield	3 kV
Operating voltage	Max. 1000 V
Mechanical characteristics	**8CMxxx.12-5**
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	20.1 mm ± 0.7 mm
Flex radius	>150.8 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s²
Flex cycles	≥ 3,000,000
Weight	0.77 kg/m

Motor cables 35 mm²
8CM



- UL/CSA certified
- Can be used in cable drag chains

Available from production in six different lengths: [1)]

Cable length	Model number
5 m	8CM005.12-8
7 m	8CM007.12-8
10 m	8CM010.12-8
15 m	8CM015.12-8
20 m	8CM020.12-8
25 m	8CM025.12-8

1) Custom fabrications are available upon request.

General information	8CMxxx.12-8
Cable cross section	4 x 35 mm² + 2 x 2 x 1.5 mm²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20669, 90°C, 600 V, E63216 and CSA AWM I/II A/B, 90°C, 600 V, FT1 LL46064
Lines	**8CMxxx.12-8**
Power lines	35 mm², tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Signal lines	1.5 mm², tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, white/red, white/blue, white/green
Cable structure	**8CMxxx.12-8**
Power lines	
Stranding	No
Shield	No
Signal lines	
Stranding	White with white/red and white/blue with white/green
Shield	Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER & RAINER 4x35.0+2x2x1.5 FLEX
Electrical characteristics	**8CMxxx.12-8**
Conductor resistance	
Power lines	≤ 0.6 Ω/km
Signal lines	≤ 14 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	3 kV
Wire/shield	1 kV
Operating voltage	Max. 600 V
Mechanical characteristics	**8CMxxx.12-8**
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	32.5 mm ± 1 mm
Flex radius	>243.8 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s²
Flex cycles	≥ 3,000,000
Weight	2.2 kg/m

EnDat cables
8CE

- UL/CSA certified
- Can be used in cable drag chains
- Produced for optimal use with ACOPOS servo drives and B&R servo motors

Available from production in six different lengths: [1)]

Cable length	Model number
5 m	8CE005.12-1
7 m	8CE007.12-1
10 m	8CE010.12-1
15 m	8CE015.12-1
20 m	8CE020.12-1
25 m	8CE025.12-1

1) Custom fabrications are available upon request.

General information	**8CExxx.12-1**
Cable cross section	10 x 0.14 mm² + 2 x 0.50 mm²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20963, 80°C, 30 V, E63216 and CSA AWM I/II A/B, 90°C, 30 V, FT1 LL46064
Lines	**8CExxx.12-1**
Signal lines	0.14 mm², tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Blue, brown, yellow, gray, green, pink, red, black, violet, white
Supply lines	0.5 mm², tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White/green, white/red
Cable structure	**8CExxx.12-1**
Signal lines	
Stranding	Green with brown, gray with yellow, white with violet, black with red, pink with blue
Shield	No
Supply lines	
Stranding	White/red with white/green and filler elements
Shield	No
Cable stranding	With foil banding
Cable shielding	Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	RAL 6018
Labeling	BERNECKER & RAINER 10x0.14+2x0.50 FLEX
Electrical characteristics	**8CExxx.12-1**
Conductor resistance	
Signal lines	≤ 140 Ω/km
Supply lines	≤ 40 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	1.5 kV
Wire/shield	0.8 kV
Operating voltage	Max. 30 V
Mechanical characteristics	**8CExxx.12-1**
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	7.3 mm ± 0.25 mm
Flex radius	>55 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s²
Flex cycles	≥ 3,000,000
Weight	0.08 kg/m

Resolver cables
8CR

- UL/CSA certified
- Can be used in cable drag chains
- Optimally produced for use with ACOPOS servo drives and B&R servo motors

Available from production in six different lengths: [1]

Cable length	Model number
5 m	8CR005.12-1
7 m	8CR007.12-1
10 m	8CR010.12-1
15 m	8CR015.12-1
20 m	8CR020.12-1
25 m	8CR025.12-1

1) Custom fabrications are available upon request.

General information	8CRxxx.12-1
Cable cross section	3 x 2 x 24 AWG/19
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20671, 90°C, 30 V, E63216 and CSA AWM, 90°C, 30 V, I/II A/B FT1 LL46064
Lines	**8CRxxx.12-1**
Signal lines	24 AWG/19, tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, brown, green, yellow, gray, pink
Cable structure	**8CRxxx.12-1**
Signal lines	
Stranding	White with brown, green with yellow, gray with pink
Shield	No
Cable stranding	The 3 pairs together covered by foil banding
Cable shielding	Cu mesh, optical coverage ≥ 90% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	RAL 6018
Labeling	BERNECKER & RAINER 3x2x24 AWG FLEX
Electrical characteristics	**8CRxxx.12-1**
Conductor resistance 24 AWG	≤ 86 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	1.5 kV
Wire/shield	0.8 kV
Operating voltage	Max. 30 V
Mechanical characteristics	**8CRxxx.12-1**
Temperature range	
Moving	-10°C to +80°C
Static	-40°C to +90°C
Outer diameter	6.5 mm ± 0.2 mm
Flex radius	≥ 50 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s²
Flex cycles	≥ 3,000,000
Weight	0.07 kg/m