8V1090.001-2

1 General information

- Modular mechanical design using plug-in modules
- Integrated line filter
- Integrated braking resistor
- All connections are made using plug-in connectors
- Integrated electronic restart inhibit
- Partially-coated circuit boards - more robust in regard to environmental influences (8Vxxxx.001-2)

2 Order data

Order number	Short description	Figure
	Servo drives	
8V1090.001-2	ACOPOS servo drive, 3x 400-480 V, 8.8 A, 4 kW, coated, integrated line filter, braking resistor and electronic safe restart interlock	
	Optional accessories	
	Plug-in modules	
8AC110.60-3	ACOPOS plug-in module, CAN interface	
8AC114.60-2	ACOPOS plug-in module, POWERLINK V2 interface	
8AC120.60-1	ACOPOS plug-in module, EnDat encoder and sine incremental encoder interface	
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	
8AC122.60-3	ACOPOS plug-in module, resolver interface 10 kHz	
8AC123.60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface	
8AC125.60-1	ACOPOS plug-in module, BiSS/SSI SinCos/SSI interface	
8AC125.60-2	ACOPOS plug-in module, BiSS encoder interface 5 V, baud rate 6.25 Mbit/s	
8AC125.61-2	ACOPOS plug-in module, BiSS encoder interface 12 V, baud rate 6.25 Mbit/s	
8AC126.60-1	ACOPOS plug-in module, EnDat 2.2 encoder interface	
8AC130.60-1	ACOPOS plug-in module, 8 digital I/O configurable in pairs as 24 V input or as output 400/100 mA, 2 digital outputs 2 A, order TB712 terminal block separately	
8AC131.60-1	ACOPOS plug-in module, 2 analog inputs ±10 V, 2 digital I/Os configurable as 24 V input or output 45 mA, order terminal block TB712 separately!	
	Included in delivery	
	Shielding component sets	
8X0010.00-1	ACOPOS shielding components set for 8V1022.xxx-x up to 8V1090.xxx-x	
	Terminal sets	
8X0001.00-1	ACOPOS accessories, plug set for 8V1010.00 and 8V1090.00 (3 phase)	

Table 1: 8V1090.001-2 - Order data

3 Technical data

Order number	8V1090.001-2
General information	
Note	Variant with partially coated printed circuit boards
B&R ID code	0xA09B
Slots for plug-in modules	4
Certifications	
CE	Yes
Functional safety [1)]	Yes
UL	cULus E225616 Power conversion equipment
EAC	Yes
KC	Yes

Table 2: 8V1090.001-2 - Technical data

Order number	8V1090.001-2
Mains connection	
Permissible network configurations	TT, TN [2]
Mains input voltage	3x 400 VAC to 480 VAC ±10% 3x 230 VAC ±10% [3]
Frequency	50 / 60 Hz ±4%
Installed load	Max. 10 kVA
Inrush current at 400 VAC	7 A
Switch-on interval	>10 s
Integrated line filter per EN 61800-3, category C3 [4]	Yes
Power dissipation at device nominal power without braking resistor	Approx. 200 W
DC bus connection	
DC bus capacitance	470 µF
24 VDC power supply	
Input voltage [5]	24 VDC ±25%
Input capacitance	8200 µF
Current consumption [6]	Max. 2.5 A + Current for motor holding brake
Motor connection	
Quantity	1
Continuous current [7]	8.8 A_{eff}
Reduction of continuous current depending on ambient temperature	
Mains input voltage: 400 VAC	
Switching frequency 5 kHz	No reduction
Switching frequency 10 kHz	0.18 A_{eff} per °C (starting at 54°C) [8]
Switching frequency 20 kHz	0.18 A_{eff} per °C (starting at 30°C)
Mains input voltage: 480 VAC	
Switching frequency 5 kHz	No reduction
Switching frequency 10 kHz	0.18 A_{eff} per °C (starting at 48°C) [8]
Switching frequency 20 kHz	0.18 A_{eff} per °C (starting at 18°C)
Reduction of continuous current depending on installation elevation	
Starting at 500 m above sea level	0.88 A_{eff} per 1000 m
Peak current	24 A_{eff}
Nominal switching frequency	10 kHz
Possible switching frequencies	5 / 10 / 20 kHz
Insulation stress of the connected motor per IEC TS 60034-25:2004 [9]	Limit value curve A
Max. motor cable length	25 m
Protective measures	
Overload protection	Yes
Short circuit and ground fault protection	Yes
Max. output frequency	598 Hz [10]
Terminal connection cross section	
Flexible and fine-stranded wires	
With wire end sleeves	0.25 to 4 mm²
Approbation data	
UL/C-UL-US	30 to 10 AWG
CSA	28 to 10 AWG
Motor holding brake connection	
Response threshold for open circuit monitoring	Approx. 385 mA
Max. output current	1 A
Max. number of switching cycles	Unlimited since implemented electronically
Braking resistor	
Peak power output	7 kW
Continuous power	200 W
Limit switch and reference inputs	
Quantity	3
Circuit	Sink
Electrical isolation	
Input - ACOPOS	Yes
Input - Input	No
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Switching threshold	
Low	<5 V
High	>15 V
Input current at nominal voltage	Approx. 4 mA
Switching delay	Max. 2.0 ms
Modulation compared to ground potential	Max. ±38 V
Enable inputs	
Quantity	1

Table 2: 8V1090.001-2 - Technical data

Order number	8V1090.001-2
Circuit	Sink
Electrical isolation	
Input - ACOPOS	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Input current at nominal voltage	Approx. 30 mA
Switching threshold	
Low	<5 V
High	>15 V
Switching delay	
Enable 0 → 1, ready for PWM	Max. 100 µs
Enable 1 → 0, PWM off	Max. 2.0 ms
Modulation compared to ground potential	Max. ±38 V
OSSD signal connections [11)]	Not permitted
Trigger inputs	
Quantity	2
Circuit	Sink
Electrical isolation	
Input - ACOPOS	Yes
Input - Input	No
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Switching threshold	
Low	<5 V
High	>15 V
Input current at nominal voltage	Approx. 10 mA
Switching delay	
Rising edge	52 µs ±0.5 µs (digitally filtered)
Falling edge	53 µs ±0.5 µs (digitally filtered)
Modulation compared to ground potential	Max. ±38 V
Electrical properties	
Discharge capacitance	660 nF
Energy efficiency (IE classification) [12)]	
Efficiency data	IE2 (10,25) 1.6% IE2 (50,25) 1.6% IE2 (10,50) 1.8% IE2 (50,50) 1.9% IE2 (90,50) 2% IE2 (10,100) 2.2% IE2 (50,100) 2.5% IE2 (90,100) 2.9%
Nominal losses in standby mode	16.8 W
Operating conditions	
Permissible mounting orientations	
Hanging vertically	Yes
Horizontal, face up	Yes
Standing horizontally	No
Installation elevation above sea level	
Nominal	0 to 500 m
Maximum [13)]	2000 m
Pollution degree per EN 61800-5-1	2 (non-conductive pollution)
Overvoltage category per EN 61800-5-1	II
Degree of protection per EN 60529	IP20
Ambient conditions	
Temperature	
Operation	
Nominal	5 to 40°C
Maximum [14)]	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

Table 2: 8V1090.001-2 - Technical data

Order number	8V1090.001-2
Mechanical properties	
Dimensions	
Width	70.5 mm
Height	375 mm
Depth	235.5 mm
Weight	4.4 kg

Table 2: 8V1090.001-2 - Technical data

1) Achievable safety classifications (safety integrity level, safety category, performance level) are documented in the user's manual (section "Safety technology").
2) TT and TN power systems are commonly referred to as "Delta/Wye with grounded wye neutral" in the USA.
3) If the module is operated with a mains input voltage of 3x 230 VAC, then automatic nominal voltage detection does not work for the DC bus. Parameter UDC_NOMINAL must be set to 325 [V] by the user in this case.
4) Limit values from EN 61800-3 C3 (second environment).
5) The permissible input voltage range is reduced when using motor holding brakes. The input voltage range must be selected so that the permissible supply voltage of the motor holding brake is maintained.
6) Current consumption depends on the respective configuration of the ACOPOS servo drive.
   The inrush current is significantly higher than the value for current consumption and can be estimated according to the input capacitance.
7) Valid under the following conditions: mains input voltage 400 VAC, nominal switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level.
8) Value for the nominal switching frequency.
9) If necessary, the stress of the motor isolation system can be reduced by an additional externally wired dv/dt choke. For example, the RWK 305 three-phase dU/dt choke from Schaffner (www.schaffner.com) can be used. Important: Even when using a dv/dt choke, it is necessary to ensure that an EMC-compatible, low inductance shield connection is used!
10) The module's electrical output frequency (SCTRL_SPEED_ACT * MOTOR_POLEPAIRS) is monitored to protect against dual use in accordance with Regulation (EC) 428/2009 | 3A225. If the electrical output frequency of the module exceeds the limit value of 598 Hz uninterrupted for more than 0.5 s, then the current movement is aborted and error 6060 is output ("Power unit: Limit speed exceeded").
11) OSSD (output signal switching device) signals are used to monitor signal lines for short circuits and cross faults.
12) The IE classification of the module is based on drive losses. This includes components such as EMC filters, etc. The efficiency data was determined at a switching frequency of 5 kHz. Classification is performed at 90% of the frequency and at 100% of the current. When operating the module in connection with an induction motor, the module is only permitted to be operated with a switching frequency of 5 kHz.
13) Continuous operation of ACOPOS servo drives at an installation elevation from 500 m to 2000 m above sea level is possible (taking the specified continuous current reductions into account).
14) Continuous operation of the ACOPOS servo drive at an ambient temperature of 40°C to max. 55°C is possible taking the specified reduction of continuous torque into account, but this results in premature aging of components.