8V1180.001-2

1 General information

- Modular mechanical design using plug-in modules
- Integrated line filter
- Integrated or optional external 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	
8V1180.001-2	ACOPOS servo drive, 3x 400-480 V, 19 A, 9 kW, coated, inte-	•
	grated line filter, braking resistor, DC bus power supply unit and	2000 0000
	electronic safe restart interlock	999
	Optional accessories	
	Braking resistors	4C0F0S 1780
8B0W0045H000.000-1	Braking resistor, 450 W, 50 R, IP20, terminals	
8B0W0045H000.001-1	Braking resistor, 450 W, 50 R, IP65, terminals	
8B0W0079H000.000-1	Braking resistor, 790 W, 33 R, IP20, terminals	0
8B0W0079H000.001-1	Braking resistor, 790 W, 33 R, IP65, terminals	
	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	
8X0020.00-1	ACOPOS shielding components set for 8V1180.xxx-x and 8V1320.xxx-x	
	Terminal sets	
8X0002.00-1	ACOPOS accessories, plug set for 8V1180.00 and 8V1320.00 (3 phase)	

Table 1: 8V1180.001-2 - Order data

3 Technical data

Order number	8V1180.001-2					
General information						
Note	Variant with partially coated printed circuit boards					
B&R ID code	0xA000					
Slots for plug-in modules	4					

Table 2: 8V1180.001-2 - Technical data

Certifications Yes Functional safety ¹) Yes UL CULus E225616 Power conversion equipment EAC Yes KC Yes Mains connection TT, TN ²) Permissible network configurations TT, TN ²) Mains input voltage 3x 400 VAC to 480 VAC ±10% Frequency 50 / 60 Hz ±4% Installed load Max. 17 kVA Inrush current at 400 VAC 13 A Switch-on interval >10 s Integrated line filter per EN 61800-3, category C3 ³) Yes Power dissipation at device nominal power without braking resistor Approx. 500 W DC bus connection 940 μF 24 VDC power supply Input voltage	Order number	8V1180.001-2
Functional safety " UL Functional safety " Ves ULU E225916 Fourit conversion equipment FAC SO Ves KG KG Ves KG KG Ves KG KG Ves KG KG KG Ves KG		8V118U.UU1-2
Functional analysis Yes Power conversion acquisment FAC Pere conversion acquisment FAC Yes KC		Ves
EAC	_	
Power conversion acquipment	-	
Mains connection		
Mains input voltage appled Main signature and SA AD WAC to 480 VAC 2 1694 Frequency (and some state of the source	EAC	Yes
Permissible network configurations	KC	Yes
Mains input voltage		
Froquency	Permissible network configurations	· · · · · · · · · · · · · · · · · · ·
Installated load Max. 17 N/A Installated load Max. 17 N/A Instal current 4 400 V/C 13 A Switch-on interval 15 A Switch-on in		
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De bus cannection Cb bus capacitance 24 VDC power supply Input votage (10 Votage) (10 Votage		Арріох. 300 ٧
24 VDC +25% / -25% -25%	-	
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Input capacitance Current consumption at 24 VDC ° Mains input voltage applied Max. 2.8 A + Current for the motor holding brake + Current on the 24 VDC output DC bus power supply unit Switch-on voltage 455 VDC 24 VDC output Output voltage Mains input voltage applied Max. 2.8 A + Current for the motor holding brake + Current on the 24 VDC output Output voltage Mains input voltage applied Mains input voltage applied Mains input voltage prot applied Mains input voltage not applied Max. 5.5 A Motor connection Cuantity 1 1 Continuous current ¹ Nax. 0.5 A Motor ground voltage not applied Mains input voltage applied Mains input voltage applied No reduction Switching frequency 10 kHz No reduction Switching frequency 20 kHz No reduction Mains input voltage applied No reduction or voltage applied No reduction or voltage applied No reduction No redu	24 VDC power supply	
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DC bus power supply unit Switch-on voltage 455 VDC		<u> </u>
Switch-on voltage 455 VDC 24 VPC output Output voltage applied 22 to 24 VDC Mains input voltage applied 16.7 to 30 VDC % Output current Max. 0.5 A Motor connection 1 Continuous current ?? 19 A _m Reduction of continuous current depending on ambient temperature Main input voltage: 400 VAC Switching frequency 10 kHz No reduction Switching frequency 20 kHz No reduction % Switching frequency 10 kHz No reduction % Switching frequency 20 kHz No reduction % Switching frequency 10 kHz No reduction % Swi		Max. 2.8 A + Current for the motor holding brake + Current on the 24 VDC output
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Quantity	•	Max. U.5 A
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Switching frequency 20 kHz No reduction	Switching frequency 5 kHz	No reduction
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Continuous power int./ext. $0.4 / 8 \text{ kW}^{11}$ Minimum braking resistance (ext.) 15Ω		14 / 40 kW
Minimum braking resistance (ext.) 15Ω		
Rated current of built-in fuse 12 A (fast-acting)		15 Ω
	Rated current of built-in fuse	12 A (fast-acting)

Table 2: 8V1180.001-2 - Technical data

Order number	8V1180.001-2
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	30 VDC
	,r.v.
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
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	Αρριολ. 30 ΠΙΑ
	ZE V
Low	<5 V
High	>15 V
Switching delay	
Enable $0 \rightarrow 1$, ready for PWM	Max. 100 μs
Enable 1 \rightarrow 0, PWM off	Max. 2.0 ms
Modulation compared to ground potential	Max. ±38 V
OSSD signal connections 12)	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	00 100
	ZE V
Low	<5 V
Low High	>15 V
Low High Input current at nominal voltage	
Low High Input current at nominal voltage Switching delay	>15 V Approx. 10 mA
Low High Input current at nominal voltage Switching delay Rising edge	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered)
Low High Input current at nominal voltage Switching delay Rising edge Falling edge	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered)
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered)
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered)
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13)	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8%
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13)	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1%
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13)	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1%
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13)	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (50,50) 1.1% IE2 (50,50) 1.1% IE2 (90,50) 1.2%
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13)	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (50,25) 0.8% IE2 (10,50) 1.1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (10,100) 1.7%
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13)	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (90,50) 1.2% IE2 (10,100) 1.7% IE2 (50,100) 2%
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13) Efficiency data	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (90,50) 1.2% IE2 (10,100) 1.7% IE2 (90,100) 2% IE2 (90,100) 2.5%
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13) Efficiency data Nominal losses in standby mode	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (90,50) 1.2% IE2 (10,100) 1.7% IE2 (50,100) 2%
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13) Efficiency data Nominal losses in standby mode Operating conditions	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (90,50) 1.2% IE2 (10,100) 1.7% IE2 (90,100) 2% IE2 (90,100) 2.5%
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13) Efficiency data Nominal losses in standby mode Operating conditions Permissible mounting orientations	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (90,50) 1.2% IE2 (10,100) 1.7% IE2 (50,100) 2% IE2 (90,100) 2.5% 31.8 W
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13) Efficiency data Nominal losses in standby mode Operating conditions Permissible mounting orientations Hanging vertically	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (90,100) 1.7% IE2 (90,100) 2.8% IE2 (90,100) 2.8% IE2 (90,100) 2.5% 31.8 W
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13) Efficiency data Nominal losses in standby mode Operating conditions Permissible mounting orientations Hanging vertically Horizontal, face up	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (90,100) 1.7% IE2 (90,100) 2.8 IE2 (90,100) 2.8 IE2 (90,100) 2.5% 31.8 W Yes Yes
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13) Efficiency data Nominal losses in standby mode Operating conditions Permissible mounting orientations Hanging vertically Horizontal, face up Standing horizontally	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (90,100) 1.7% IE2 (90,100) 2.8% IE2 (90,100) 2.8% IE2 (90,100) 2.5% 31.8 W
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13) Efficiency data Nominal losses in standby mode Operating conditions Permissible mounting orientations Hanging vertically Horizontal, face up Standing horizontally Installation elevation above sea level	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (90,50) 1.2% IE2 (10,100) 1.7% IE2 (50,010) 2% IE2 (90,100) 2.5% 31.8 W Yes Yes No
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13) Efficiency data Nominal losses in standby mode Operating conditions Permissible mounting orientations Hanging vertically Horizontal, face up Standing horizontally Installation elevation above sea level Nominal	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (90,50) 1.2% IE2 (10,100) 1.7% IE2 (50,100) 2% IE2 (90,100) 2.5% 31.8 W Yes Yes No
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13) Efficiency data Nominal losses in standby mode Operating conditions Permissible mounting orientations Hanging vertically Horizontal, face up Standing horizontally Installation elevation above sea level	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (90,50) 1.2% IE2 (10,100) 1.7% IE2 (50,010) 2% IE2 (90,100) 2.5% 31.8 W Yes Yes No
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13) Efficiency data Nominal losses in standby mode Operating conditions Permissible mounting orientations Hanging vertically Horizontal, face up Standing horizontally Installation elevation above sea level Nominal	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (90,50) 1.2% IE2 (10,100) 1.7% IE2 (50,100) 2% IE2 (90,100) 2.5% 31.8 W Yes Yes No
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13) Efficiency data Nominal losses in standby mode Operating conditions Permissible mounting orientations Hanging vertically Horizontal, face up Standing horizontally Installation elevation above sea level Nominal Maximum 14)	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (50,50) 1.1% IE2 (90,50) 1.2% IE2 (90,50) 1.7% IE2 (90,10) 1.7% IE2 (50,100) 2% IE2 (90,100) 2.5% 31.8 W Yes Yes No O to 500 m 2000 m
Low High Input current at nominal voltage Switching delay Rising edge Falling edge Modulation compared to ground potential Electrical properties Discharge capacitance Energy efficiency (IE classification) 13) Efficiency data Nominal losses in standby mode Operating conditions Permissible mounting orientations Hanging vertically Horizontal, face up Standing horizontally Installation elevation above sea level Nominal Maximum 14) Pollution degree per EN 61800-5-1	>15 V Approx. 10 mA 52 µs ±0.5 µs (digitally filtered) 53 µs ±0.5 µs (digitally filtered) Max. ±38 V 3.1 µF IE2 (10,25) 0.7% IE2 (50,25) 0.8% IE2 (10,50) 1% IE2 (10,50) 1% IE2 (10,50) 1.1% IE2 (90,50) 1.2% IE2 (10,100) 1.7% IE2 (50,100) 2% IE2 (50,100) 2% IE2 (90,100) 2.5% 31.8 W Yes Yes No O to 500 m 2000 m 2 (non-conductive pollution)

Table 2: 8V1180.001-2 - Technical data

Order number	8V1180.001-2
Ambient conditions	
Temperature	
Operation	
Nominal	5 to 40°C
Maximum 15)	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C
Mechanical properties	
Dimensions	
Width	200 mm
Height	375 mm
Depth	234 mm
Weight	10.1 kg

Table 2: 8V1180.001-2 - 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) Limit values from EN 61800-3 C3 (second environment).
- 4) 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.
- 5) If the mains input voltage is present (3x 400 VAC to 480 VAC ±10%), the 24 VDC supply voltage for the ACOPOS servo drive is generated by the internal DC bus power supply unit, reducing the 24 VDC current consumption (I_{24VDC}) to 0.
- 6) If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is not present, the voltage on the 24 VDC output is generated from the 24 VDC power supply of the ACOPOS servo drive; in this case, it lies between the maximum permissible and the (reduced by a maximum of 2.5 V) minimum permissible 24 VDC power supply of the ACOPOS servo drive.
- 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.
- 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) Continuous power refers to the maximum braking power the ACOPOS servo drive can exchange continuously. Depending on the application, the actual continuous power provided by the external braking resistor is limited by the rated current of fuse I_B (integrated in the ACOPOS servo drive), and the value of the external braking resistance R_{BR}.
- 12) OSSD (output signal switching device) signals are used to monitor signal lines for short circuits and cross faults.
- 13) 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.
- 14) 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).
- 15) 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.

4 Status indicators

ACOPOS servo drives are equipped with three LEDs for direct diagnostics:



Figure 1: ACOPOS servo drive indicators

LED status indicators

Label	Color	Function	Description				
READY	Green	Ready	Solid green	The module is operational and the power stage can be enabled (operating systems present and booted, no permanent or temporary errors).			
			Blinking green 1)	The module is not ready for operation. Examples:			
				No signal on one or both enable inputs			
				DC bus voltage outside the tolerance range			
				Overtemperature on the motor (temperature sensor)			
				Motor feedback not connected or defective			
				Motor temperature sensor not connected or defective			
				 Overtemperature on the module (IGBT junction, heat sink, etc.) 			
				Disturbance on network			
RUN	Orange	Run	Solid orange	The module's power stage is enabled.			
ERROR	Red	Error	Solid red 1)	There is a permanent error on the module.			
				Examples:			
				Permanent overcurrent			
				Invalid data in EPROM			

Table 3: ACOPOS servo drive - LED status indicators

If no LED is lit up, the ACOPOS servo drive is not supplied with 24 VDC mains voltage.

Danger!

After switching off the device, wait for the DC bus to discharge for at least five minutes. To avoid a hazard, the current voltage on the DC bus must be measured with a suitable measuring instrument and less than 42 VDC before starting work. An unlit operating LED does not indicate that the device is de-energized!

4.1 Status changes when starting up the operating system loader

The following intervals are used for the LED status indicators:

Width of box: 125 ms Repeats after: 3000 ms

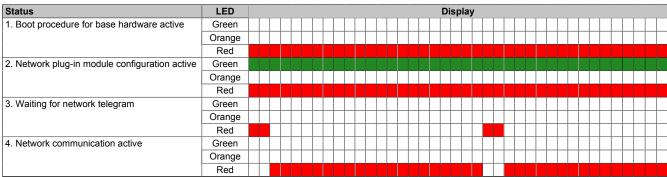


Table 4: Status changes when starting up the operating system loader

¹⁾ Firmware V2.130 and later.

Error status with reference to CAN plug-in module AC110

Status	LED	Display																			
Invalid hardware ID 1)	Green																				
	Orange													П		П					
	Red											П									
Boot error in CAN base hardware	Green											П		П		П					
	Orange											П									
	Red											П							П		
Bus off	Green											П		П	П	П	Т	П			
	Orange																				
	Red											П							П		
The CAN station number is 0.	Green											П		П		П					
	Orange											П				П					
	Red											П									

Table 5: Error status with reference to CAN plug-in module AC110

1) Possible errors:

- The ACOPOS servo drive is defective.
- The plug-in module is defective
- The plug-in module is not connected properly in the slot.

Error status with reference to POWERLINK V2 plug-in module AC114

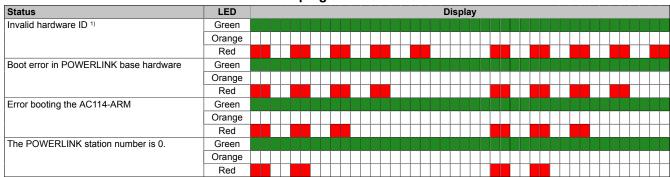


Table 6: Error status with reference to POWERLINK V2 plug-in module AC114

1) Possible errors:

- The ACOPOS servo drive is defective (plug-in module not detected).
- The plug-in module is defective
- The plug-in module is not connected properly in the slot.
- The plug-in module works but is not automatically detected by the ACOPOS servo drive (old bootstrap loader).

5 Dimension diagram and installation dimensions

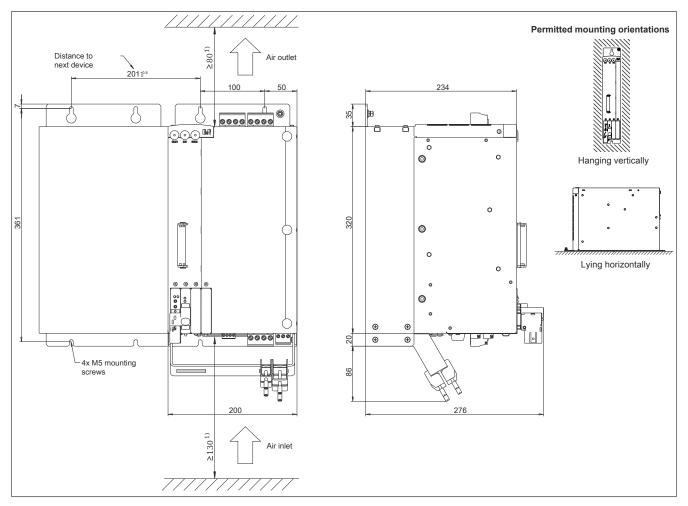


Figure 2: Dimension diagram and installation dimensions

1) For proper air circulation, at least 80 mm clearance must be available above and below the ACOPOS servo drive. At least 130 mm free space is required under the ACOPOS servo drive to prevent cabling problems.

6 Wiring

Pinout overview

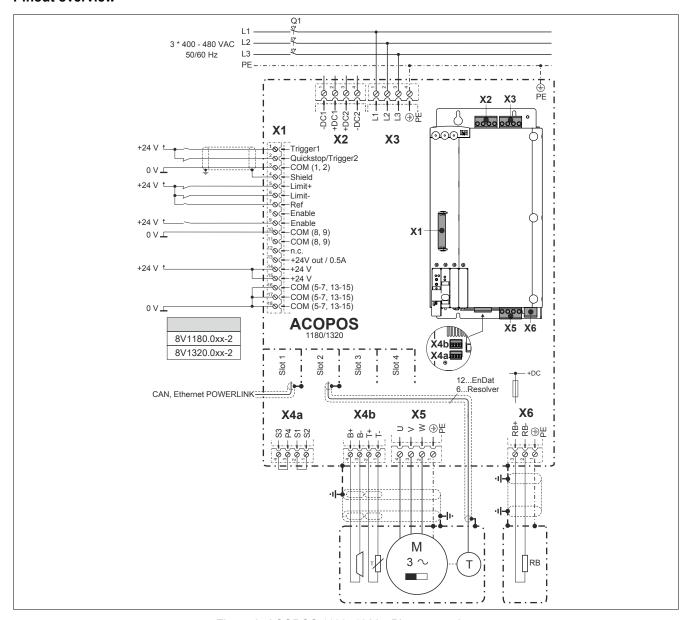


Figure 3: ACOPOS 1180, 1320 - Pinout overview

6.1 X1 - Pinout

X1	Pin	Name	Function						
	1	Trigger1	Trigger 1						
	2	Quickstop/Trigger2	Quickstop/Trigger2						
	3	COM (1, 2)	Trigger 1, Quickstop/Trigger 2 0 V						
	4	Shield	Shield						
	5	Limit+	Positive HW limit						
	6	Limit-	Negative HW limit						
	7	Ref	Reference switch						
	8	Enable 1)	Enable						
	9	Enable 1)	Enable						
	10	COM (8, 9)	Enable 0 V						
	11	COM (8, 9)	Enable 0 V						
	12								
	13	+24V out / 0.5A	+24 V output / 0.5 A						
	14	+24 V	+24 V supply						
	15	+24 V	+24 V supply						
15 2	16	COM (5-7, 13-15)	0 V supply						
	17	COM (5-7, 13-15)	0 V supply						
	18	COM (5-7, 13-15)	0 V supply						
	The following connections are linked with each other internally in the device:								
	• Pin 8> Pin 9 (Enable)								
	• Pin 10> Pin 11 (Enable 0 V)								
	• Pin 14> Pin 15 (Supply +24 V)								
	• Pin 16> Pin 17> Pin 18 (Supply 0 V)								

Table 7: X1 - Pinout

Information:

To obtain a defined reference of ground to ground potential, B&R recommends grounding the COM connections (5-7, 13-15) on connector X1.

6.2 X2 - Pinout

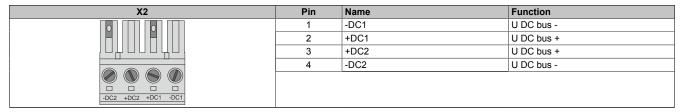


Table 8: X2 - Pinout

6.3 X3 - Pinout

Danger!

Servo drives are not permitted to be operated directly on IT power systems and corner-grounded TN-S power systems with protective ground conductor!

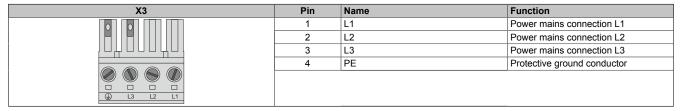


Table 9: X3 - Pinout

¹⁾ The wiring is not permitted to exceed a total length of 30 m.

6.4 X4a, X4b - Pinout

X4a	Pin	Description	Function
	1	S2 ¹⁾	Enabling, power supply of external holding brake (+)
	2	S1 ¹⁾	Enabling of external holding brake (+)
	3	S4	Enabling, power supply of external holding brake (-)
	4	S3	Enabling of external holding brake (-)
S3 S4 S1 S2			

Table 10: X4a - Pinout

1) If the holding brake is connected via an additional external relay contact (ground-in e.g. via connections S1/S2) instead of only via the internal transistor, then the internal quenching circuit has no effect! In this case, the customer must make sure that neither the relay contact nor the braking coil are damaged when switching off the brake. This can be done by interconnecting the coil or - better still - interconnecting the contact with a quenching circuit.

X4b	Pin	Description	Function
	1	T-	Temperature sensor -
	2	T+	Temperature sensor +
	3	B- 1)	Brake -
	4	B+ 1)	Brake +
B+ B- T+ T-			

Table 11: X4b - Pinout

1) If the holding brake is connected via an additional external relay contact (ground-in e.g. via connections S1/S2) instead of only via the internal transistor, then the internal quenching circuit has no effect! In this case, the customer must make sure that neither the relay contact nor the braking coil are damaged when switching off the brake. This can be done by interconnecting the coil or - better still - interconnecting the contact with a quenching circuit.

Danger!

The connections for the motor temperature sensors and the motor holding brake are safely isolated circuits. These connections are therefore only permitted to be connected to devices or components that have sufficient isolation per IEC 60364-4-41 or EN 61800-5-1.

Caution!

If B+ and B- are swapped when connecting the permanent magnet holding brakes, then the brakes cannot be opened! ACOPOS servo drives cannot determine if a holding brake is connected with reverse polarity!

6.4.1 Wiring the connections for the motor holding brake

The power supply, enabling and monitoring of the output for the motor holding brake can be carried out in three different ways via the wiring of connector X4a:

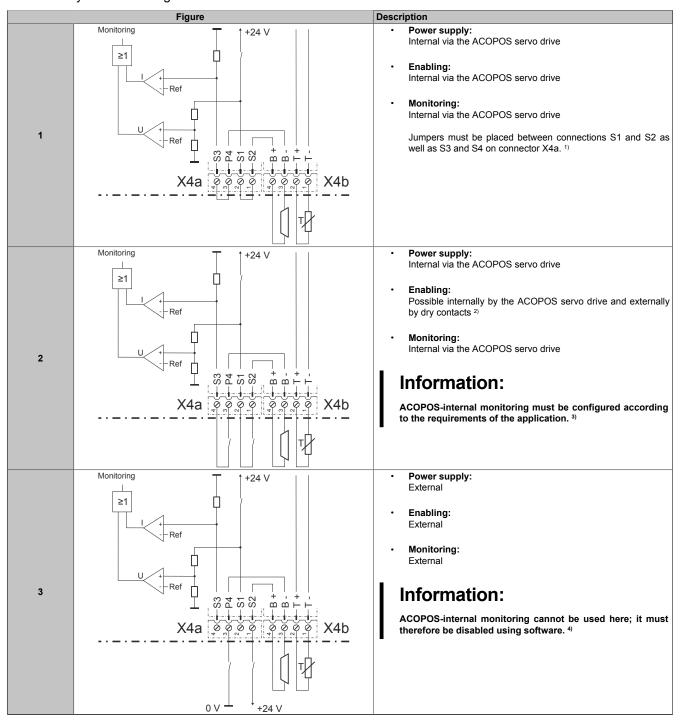


Table 12: Enabling the external holding brake

- 1) The two jumpers are already wired on connector X4a supplied with ACOPOS servo drives.
- 2) External dry contacts can be connected between S1 and S2 and between S3 and S4. This makes it possible to enable the holding brake via external safety circuits independently of the control integrated in the ACOPOS servo drive.
- 3) Configuration takes place using ParID 90 (1 ... Internal monitoring active, 5 ... Internal monitoring not active).
- 4) Disabling takes place using ParID 90 (5 ... Internal monitoring not active).

6.5 X5 - Pinout

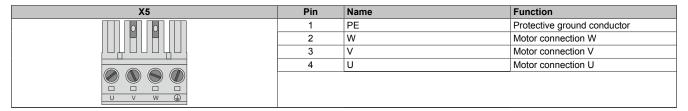


Table 13: X5 - Pinout

6.6 X6 - Pinout

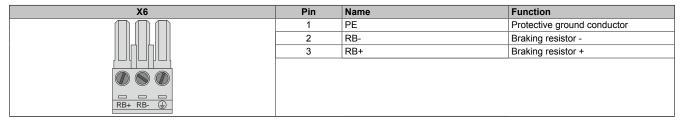


Table 14: X6 - Pinout

6.7 Additional protective ground connection (PE)

The protective ground conductor is connected to the M5 threaded bolt provided using a cable lug.

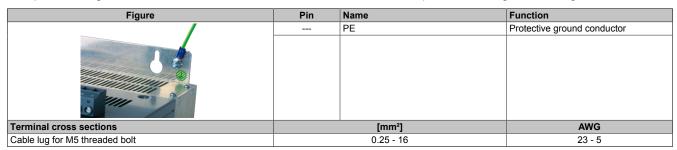


Table 15: Protective ground connection (PE) - ACOPOS

Danger!

Before turning on the servo drive, make sure that the housing is properly connected to ground (PE rail). The ground connection must be established even when testing the drive or operating it for a short time!

6.8 Input/output circuit diagram

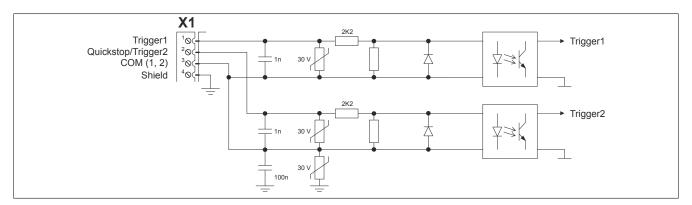


Figure 4: Trigger

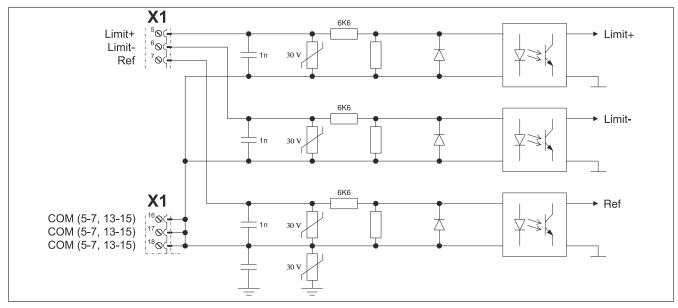


Figure 5: Limit

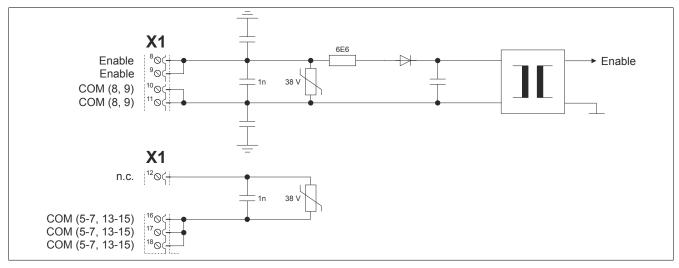


Figure 6: Enable

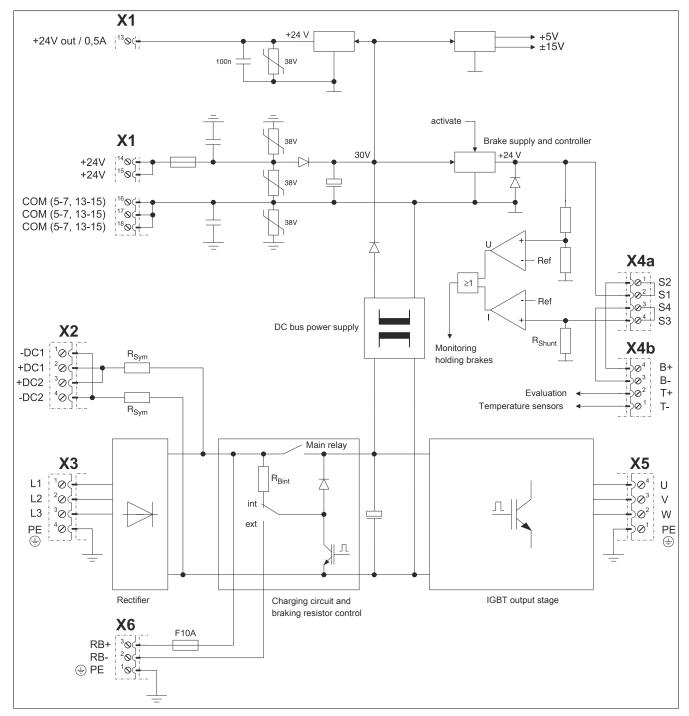


Figure 7: Input/output circuit diagram - ACOPOS 1180, 1320