

# 8EI8X8HCS10.XXXX-1

## 1 Order data


| Order number       | Short description   | Figure  |
|--------------------|---|---|
|                    | <b>1-axis modules</b>   |  |
| 8EI8X8HCS10.XXXX-1 | ACOPOS P3 servo drive, 1 digital multi-standard encoder interface per axis, 3x 200-480 VAC, 8.8 A, 1 axis, AS, cold plate or pass-through mounting  |   |
|                    | <b>Optional accessories</b>   |   |
|                    | <b>Display modules</b>  |   |
| 8EAD0000.000-1     | Display module, LCD, 128 x 64, black/white, 1x USB 3.0  |   |
|                    | <b>Front covers</b>   |   |
| 8EXA100.0010-00    | ACOPOS P3 cover, B&R orange, single-width, height 1   |   |
| 8EXA100.0020-00    | ACOPOS P3 cover, B&R dark gray, single-width, height 1  |   |
|                    | <b>Passive line filter</b>  |   |
| 8B0F0160H000.A00-1 | Passive line filter, 16 A, 3x 480 VAC, 50/60 Hz, IP20   |   |
| 8B0F0300H000.000-1 | Passive line filter, 30 A, 3x 520 VAC, 50/60 Hz, IP20   |   |
| 8B0F0550H000.000-1 | Passive line filter, 55 A, 3x 520 VAC, 50/60 Hz, IP20   |   |
|                    | <b>Plug-in modules</b>  |   |
| 8EAC0122.001-1     | ACOPOS P3 plug-in module, resolver interface 10 kHz   |   |
| 8EAC0130.000-1     | ACOPOS P3 plug-in module, 8 digital I/O 24 V (4x 400 mA, 4x 100 mA) individually configurable as inputs or outputs, 2 digital I/O 24 V 2 A configurable in pairs as inputs or outputs, order terminal block 8TB0230.221A-00 separately! |   |
| 8EAC0150.001-1     | ACOPOS P3 plug-in module, digital multi-encoder interface   |   |
| 8EAC0151.001-1     | ACOPOS P3 plug-in module, incremental encoder interface   |   |
| 8EAC0152.001-1     | ACOPOS P3 plug-in module, analog multi-encoder interface  |   |
|                    | <b>Shield component sets</b>  |   |
| 8SCSE01.0100-00    | ACOPOS P3 shield component set: 1x ACOPOS P3 shield mounting plate, 1x 2x M3x6 screws   |   |
| 8SCSE01.0300-00    | ACOPOS P3 shield component set: 1x support plate with 2 grounding clamps 3-6 mm, 1x M4x6 screw  |   |
| 8SCSE02.0100-00    | ACOPOS P3 shield component set: 1x shield component set, type SK14  |   |
| 8SCSE02.0200-00    | ACOPOS P3 shield component set: 1x shield component set, type SK20  |   |
|                    | <b>Terminals</b>  |   |
| 8TB2104.2210-00    | Push-in terminal block 4-pin, 1-row, pitch: 5.08 mm, label 1: numbered consecutively  |   |
| 8TB2104.2210-50    | Push-in terminal block, 4-pin, yellow, single row, with locking mechanism, spacing: 5.08 mm, label 1: 4 3 2 1   |   |
| 8TB2204.2210-50    | Push-in terminal block, 4-pin, yellow, 2-row, spacing: 5.08 mm, label 1: 4 3 2 1  |   |
| 8TB3102.222C-20    | Push-in terminal block, 2-pin, single row, with locking mechanism, spacing: 7.62 mm, label 2: COM 24 V, C keying: 10  |   |
| 8TB3103.222A-20    | Push-in terminal block, 3-pin, 1-row, spacing: 7.62 mm, label 2: PE RB- RB+, A keying: 000  |   |
| 8TB3106.222B-20    | Push-in terminal block, 6-pin, single row, with locking mechanism, spacing: 7.62 mm, label 2: PE L3 L2 L1 DC- DC+, B keying: 000001   |   |
| 8TB3202.222C-40    | Push-in terminal block, 2-pin, 2-row, with locking mechanism, spacing: 7.62 mm, label 2: COM 24 V, C keying: 10   |   |
| 8TB3206.222B-40    | Push-in terminal block, 6-pin, 2-row, with locking mechanism, spacing: 7.62 mm, label 2: PE L3 L2 L1 DC- DC+, C keying: 000001  |   |
| 8TB3308.222A-00    | 4+4-pin push-in terminal block 1-row / 2-row, pitch: 7.62 mm, label 2: T- B- T+ B+ PE W V U coding A: 0000  |   |

Table 1: 8EI8X8HCS10.XXXX-1 - Order data

## 2 Technical data

| Order number   | 8EI8X8HCS10.XXXX-1  |
|--|---|
| <b>General information</b>   |   |
| Slots for plug-in modules  | 1   |
| Certifications   |   |
| CE   | In preparation  |
| UL   | In preparation  |
| EAC  | Yes   |
| KC   | In preparation  |
| <b>Mains connection</b>  |   |
| Network configurations   | TN-S, TN-C-S with grounded neutral  |
| Mains input voltage  | 3x 200 VAC to 480 VAC ±10%  |
| Frequency  | 50 / 60 Hz ±4%  |
| Installed load   | Max. 10 kVA   |
| Inrush current   | Max. 45 A   |
| Switch-on interval   | Typ. 60 s   |
| Integrated line filter per EN 61800-3, category C3                                 | No <sup>1)</sup>  |
| Terminal connection cross section  |   |
| Flexible and fine-stranded wires   |   |
| With wire end sleeves  | 0.25 to 4 mm <sup>2</sup>   |
| Approbation data   |   |
| UL/C-UL-US   | 24 to 8 AWG   |
| CSA  | 24 to 8 AWG   |
| Power dissipation at device nominal power without braking resistor                 | $[(40 + 6.9 \cdot P_{AVG} \text{ [kW]} + 7.5 \cdot I_{AX1} \text{ [A]} + 0.25 \cdot I_{BR1}^2 \text{ [A]} + P_{VSL0T}) \cdot 1.1] \text{ [W]}^{2)}$ |
| Max. line length   | 3 m <sup>3)</sup>   |
| <b>DC bus connection</b>   |   |
| Continuous power <sup>4)</sup>   | 4 kW  |
| Reduction of continuous power depending on mains input voltage                     |   |
| Mains input voltage <3x 400 VAC  | 4 kW * (Mains input voltage [V] / 400 V)  |
| DC bus capacitance   | 470 µF  |
| Terminal connection cross sections   |   |
| Flexible and fine-stranded wires   |   |
| With wire end sleeves  | 0.25 to 4 mm <sup>2</sup>   |
| Approbation data   |   |
| UL/C-UL-US   | 24 to 8 AWG   |
| CSA  | 24 to 8 AWG   |
| Max. line length   | 3 m <sup>5)</sup>   |
| <b>24 VDC power supply</b>   |   |
| Input voltage  | 24 VDC ±25%   |
| Input capacitance  | 4310 µF   |
| Current consumption  | 0.9 A + Current for motor holding brake <sup>6)</sup>   |
| Terminal connection cross sections   |   |
| Flexible and fine-stranded wires   |   |
| With wire end sleeves  | 0.25 to 4 mm <sup>2</sup>   |
| Approbation data   |   |
| UL/C-UL-US   | 24 to 8 AWG   |
| CSA  | 24 to 8 AWG   |
| Max. line length   | 30 m  |
| <b>Motor connection</b>  |   |
| Quantity   | 1   |
| Continuous power per motor connection <sup>7)</sup>                                | 4 kW  |
| Continuous current per motor connection <sup>7)</sup>                              | 8.8 A <sub>eff</sub>  |
| Reduction of continuous current depending on switching frequency and mounting type |   |
| Switching frequency 5 kHz  |   |
| Cold plate mounting  | In preparation  |
| Feed-through mounting  | In preparation  |
| Switching frequency 10 kHz   |   |
| Cold plate mounting  | In preparation  |
| Feed-through mounting  | In preparation  |
| Switching frequency 20 kHz   |   |
| Cold plate mounting  | In preparation  |
| Feed-through mounting  | In preparation  |
| Reduction of continuous current depending on installation elevation                |   |
| Starting at 500 m above sea level  | 0.88 A <sub>eff</sub> per 1000 m  |
| Peak current per motor connection  | 24 A <sub>eff</sub>   |
| Peak power output  | 10 kW   |
| Nominal switching frequency  | 5 kHz   |
| Possible switching frequencies <sup>8)</sup>                                       | 5 / 10 / 20 kHz   |

Table 2: 8EI8X8HCS10.XXXX-1 - Technical data

| Order number  | 8EI8X8HCS10.XXXX-1   |
|---|--|
| Insulation stress of the connected motor per IEC TS 60034-25:2004 | Limit value curve A  |
| Protective measures   |  |
| Overload protection   | Yes  |
| Short circuit and ground fault protection                         | Yes  |
| Max. output frequency   | 598 Hz <sup>9)</sup>   |
| Variant   |  |
| U, V, W, PE   | Connector  |
| Shield connection   | Yes  |
| Terminal connection cross section                                 |  |
| Flexible and fine-stranded wires                                  |  |
| With wire end sleeves   | 1.5 to 6 mm <sup>2</sup>                                     |
| Approbation data  |  |
| UL/C-UL-US  | 24 to 8 AWG  |
| CSA   | 24 to 8 AWG  |
| Max. motor cable length depending on switching frequency          |  |
| Switching frequency 5 kHz   | 75 m <sup>10)</sup>  |
| Switching frequency 10 kHz  | 38 m <sup>10)</sup>  |
| Switching frequency 20 kHz  | 19 m <sup>10)</sup>  |
| <b>Motor holding brake connection</b>                             |  |
| Quantity  | 1  |
| Output voltage <sup>11)</sup>                                     | Depends on the input voltage on connector X2                 |
| Continuous current  | 1.3 A  |
| Max. internal resistance  | 0.25 Ω   |
| Extinction potential  | Approx. 30 V   |
| Max. extinction energy per switching operation                    | 1.5 Ws   |
| Max. switching frequency  | 0.5 Hz   |
| Protective measures   |  |
| Overload and short-circuit protection                             | Yes  |
| Open circuit monitoring   | Yes  |
| Undervoltage monitoring   | Yes  |
| Response threshold for open circuit monitoring                    | Approx. 30 mA  |
| Response threshold for undervoltage monitoring                    | Approx. 23 V   |
| Max. line length  | 75 m <sup>12)</sup>  |
| <b>Braking resistor <sup>13)</sup></b>                            |  |
| Peak power output   | 25 kW  |
| Continuous power  | 2 kW   |
| Minimum braking resistance (ext.)                                 | 25 Ω   |
| Terminal connection cross section                                 |  |
| Flexible and fine-stranded wires                                  |  |
| With wire end sleeves   | 0.25 to 4 mm <sup>2</sup>                                    |
| Approbation data  |  |
| UL/C-UL-US  | 24 to 8 AWG  |
| CSA   | 24 to 8 AWG  |
| Protective measures   |  |
| Overload protection   | No   |
| Short circuit and ground fault protection                         | Short-circuit protection: Yes<br>Ground fault protection: No |
| Max. line length  | 3 m  |
| <b>Fieldbus</b>   |  |
| Type  | POWERLINK V2 controlled node (CN)                            |
| Variant   | 2x RJ45, shielded, 2-port hub                                |
| Line length   | Max. 100 m between 2 stations (segment length)               |
| Transfer rate   | 100 Mbit/s   |
| <b>Enable inputs</b>  |  |
| Quantity  | 2  |
| Circuit   | Sink   |
| Electrical isolation  |  |
| Input - ACOPOS P3   | Yes  |
| Input - Input   | Yes  |
| Input voltage   |  |
| Nominal   | 24 VDC   |
| Maximum   | 30 VDC   |
| Input current at nominal voltage                                  | Approx. 9 mA   |
| Switching threshold   |  |
| Low   | <5 V   |
| High  | >15 V  |
| Switching delay at nominal input voltage                          |  |
| Enable 1 → 0, PWM off   | 2 ms   |
| Enable 0 → 1, ready for PWM                                       | 0.3 ms   |
| Modulation compared to ground potential                           | Max. ±38 V   |
| OSSD signal connections <sup>14)</sup>                            | 0.5 ms   |

Table 2: 8EI8X8HCS10.XXXX-1 - Technical data

| Order number   | 8EI8X8HCS10.XXXX-1  |
|--|---|
| Terminal connection cross sections                   |   |
| Flexible and fine-stranded wires                     |   |
| With plastic wire end sleeves                        | 0.25 to 2.5 mm <sup>2</sup>   |
| Approbation data                                     |   |
| UL/C-UL-US   | 26 to 12 AWG  |
| CSA  | 26 to 12 AWG  |
| Max. line length                                     | 30 m  |
| <b>Encoder interfaces</b>                            |   |
| Quantity   | 1   |
| Type   | Digital multi-encoder interface, configurable <sup>15)</sup>  |
| Connections  | 8-pin female Mini I/O connector   |
| Status indicators                                    | None <sup>16)</sup>   |
| Electrical isolation                                 |   |
| Encoder - ACOPOS P3                                  | No  |
| Max. encoder cable length                            | 75 m<br>Depends on the cross section of the power supply wires in the encoder cable <sup>17)</sup>  |
| Encoder power supply                                 |   |
| Output voltage                                       | Configurable<br>Typ. 11.45 V ±0.1 V / 5.2 V ±0.1 V <sup>18)19)</sup>  |
| Load capacity  | Max. 300 mA   |
| Protective measures                                  |   |
| Short-circuit proof                                  | Yes   |
| Overload-proof                                       | Yes   |
| Synchronous serial interface                         |   |
| Signal transmission                                  | RS485 <sup>20)</sup>  |
| Data transfer rate                                   | Depends on the configured encoder type  |
| Differential voltage <sup>21)</sup>                  |   |
| Minimum  | 2.0 V   |
| Maximum  | 6.0 V   |
| Max. power consumption per encoder interface         | $P_{\text{ENCODER}} [\text{W}] = U_{24\text{V}} [\text{V}] * (I_{\text{ENCODER}} [\text{A}] * 0.7) + 0.5 \text{ W}$ <sup>22)</sup>                            |
| <b>Trigger inputs</b>                                |   |
| Quantity   | 2   |
| Circuit  | Sink  |
| Electrical isolation                                 |   |
| Input - ACOPOS P3                                    | Yes   |
| Input - Input  | Yes   |
| Input voltage  |   |
| Nominal  | 24 VDC  |
| Maximum  | 30 VDC  |
| Switching threshold                                  |   |
| Low  | <5 V  |
| High   | >15 V   |
| Input current at nominal voltage                     | 7 mA  |
| Switching delay                                      |   |
| Rising edge  | <51 µs  |
| Falling edge   | <52 µs  |
| Modulation compared to ground potential              | Max. ±38 V  |
| Terminal connection cross section                    |   |
| Flexible and fine-stranded wires                     |   |
| With wire end sleeves                                | 0.25 to 2.5 mm <sup>2</sup>   |
| Approbation data                                     |   |
| UL/C-UL-US   | 26 to 12 AWG  |
| CSA  | 26 to 12 AWG  |
| Max. line length                                     | 100 m   |
| <b>Support</b>                                       |   |
| Motion system  |   |
| mapp Motion  | 5.00.0 and higher   |
| ACP10/ARNC0  | 3.13.0 and higher   |
| <b>Electrical properties</b>                         |   |
| Energy efficiency (IE classification) <sup>23)</sup> |   |
| Efficiency data                                      | IE2 (10,25) 2.5%<br>IE2 (50,25) 2.6%<br>IE2 (10,50) 2.7%<br>IE2 (50,50) 2.9%<br>IE2 (90,50) 3.3%<br>IE2 (10,100) 3.3%<br>IE2 (50,100) 3.9%<br>IE2 (90,100) 5% |
| Nominal losses in standby mode                       | 12.2 W  |
| <b>Operating conditions</b>                          |   |
| Permissible mounting orientations                    |   |
| Hanging vertically                                   | Yes   |
| Horizontal, face up                                  | No  |
| Standing horizontally                                | No  |

Table 2: 8EI8X8HCS10.XXXX-1 - Technical data

| Order number                           | 8EI8X8HCS10.XXXX-1                       |
|--|--|
| Installation elevation above sea level |  |
| Nominal                                | 0 to 500 m                               |
| Maximum                                | 4000 m                                   |
| Pollution degree per EN 61800-5-1      | 2 (non-conductive pollution)             |
| Overvoltage category per EN 61800-5-1  | III                                      |
| Degree of protection per EN 60529      | IP20 <sup>24)</sup>                      |
| <b>Ambient conditions</b>              |  |
| Temperature                            |  |
| Operation                              |  |
| Nominal                                | 5 to 40°C                                |
| Maximum                                | 55°C                                     |
| Storage                                | -25 to 55°C                              |
| Transport                              | -25 to 70°C                              |
| Relative humidity                      |  |
| Operation                              | 5 to 85%, non-condensing                 |
| Storage                                | 5 to 95%                                 |
| Transport                              | 95% at 40°C                              |
| <b>Mechanical properties</b>           |  |
| Dimensions <sup>25)</sup>              |  |
| Width                                  | 66 mm                                    |
| Height                                 | 290 mm                                   |
| Depth                                  |  |
| Cold plate                             | 281.5 mm (with 8EXA front cover: 284 mm) |
| Feed-through mounting                  | 277.5 mm (with 8EXA front cover: 280 mm) |
| Weight                                 | 3.8 kg                                   |

Table 2: 8EI8X8HCS10.XXXX-1 - Technical data

- 1) A line filter must be connected.  
CE compliance can only be ensured by connecting a B&R line filter (8x0F...).
- 2)  $P_{AVG}$  ... Average continuous power of the module  
 $I_{AX1}$  ... RMS value of the current on axis 1  
 $I_{BR1}$  ... Nominal current of the motor holding brake for axis 1  
 $P_{VSLOT}$  ... Power dissipation of the 8EAC plug-in module
- 3) Maximum line length between line filter and mains connection on the module.
- 4) Valid for mains input voltage  $\geq 3 \times 400$  VAC.  
The sum of the continuous power values on all motor connections and the power of the DC bus connector is not permitted to exceed this value.
- 5) This value applies to unshielded wiring inside a control cabinet.  
Maximum length of the DC bus wiring inside a control cabinet.
- 6) Current consumption depends on the respective configuration of the ACOPOS P3 8EI servo drive.  
The inrush current of the 24 VDC power supply is not limited by the module.
- 7) Valid under the following conditions: 560 VDC DC bus voltage, 5 kHz switching frequency, 40°C ambient temperature, installation elevation <500 m above sea level, no derating due to cooling type.
- 8) B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases CPU utilization.
- 9) 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").
- 10) The sum of the cable lengths of all motor cables connected to this module is not permitted to exceed this value.
- 11) During configuration, it is necessary to check if the minimum voltage can be maintained on the holding brake with the specified input voltage and wiring. For the operating voltage range of the holding brake, see the user documentation for the motor being used.
- 12) During configuration, it is necessary to check if the minimum voltage can be maintained on the holding brake with the intended line length. For the permissible operating voltage range of the holding brake, see the user documentation for the motor being used.
- 13) This values apply to an external braking resistor. This module is not equipped with an internal braking resistor.
- 14) OSSD (output signal switching device) signals are used to monitor signal lines for short circuits and cross faults.
- 15) The encoder type is not predefined from the factory. The encoder type necessary in each case must be configured in Automation Studio.
- 16) The direction of rotation of the encoder can be displayed on the 8EAD0000.000-1 display module.
- 17) Maximum encoder cable length  $I_{max}$  can be calculated as follows (the maximum permissible encoder cable length of 75 m is not permitted to exceeded):  
$$I_{max} = f / I_G \cdot A \cdot 1/(2 \cdot \rho)$$
  
 $f$  ... (Output voltage of encoder interface [V] - Min. permissible supply voltage of connected encoder [V]) \* 1.1  
 $I_G$  ... Max. current consumption of the connected encoder [A].  
 $A$  ... Cross section of the power supply wires [mm<sup>2</sup>]  
 $\rho$  ... Specific resistance [ $\Omega$  mm<sup>2</sup>/m] (e.g. for copper:  $\rho = 0.0178$ )
- 18) The output voltage is not predefined from the factory (with the exception of encoder types EnDat 2.2 and HIPERFACE DSL). It must be configured in Automation Studio based on the encoder type. If no output voltage is configured, then the encoder will not be supplied by digital multi-encoder interface X4x. Power to the encoder can then be supplied externally.
- 19) Output voltage 5.2 V is only available under the following conditions:  
- 8EI servo drive with 8ZECxxx revision D0 and higher - see the device information on the left side cover of the 8EI servo drive  
- ACOPOS operating system 3.15.0 and higher (for 8ElxxxxxD... 2-axis modules and 8ElxxxxT... 3-axis modules)  
- ACOPOS operating system 3.17.0 and higher (for 8ElxxxxS... 1-axis modules)
- 20) Except encoder type HIPERFACE DSL.
- 21) Values valid for clock output and data input. Except encoder type HIPERFACE DSL.
- 22)  $I_{ENCODER}$  ... Current consumption of the encoder  
 $U_{24V}$  ... Input voltage on the +24 VDC input of the module

- 23) 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 (factory setting). 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.
- 24) The specified degree of protection is only met if either the slot cover is installed on the module or an 8EAC plug-in module is installed and suitable terminals are connected to all connectors and all fans are installed.
- 25) These dimensions refer to the actual device dimensions including the respective mounting plate. Additional spacing above and below the devices must be taken into account for mounting, connections and air circulation.

### 3 Status indicators

#### 3.1 1-axis modules

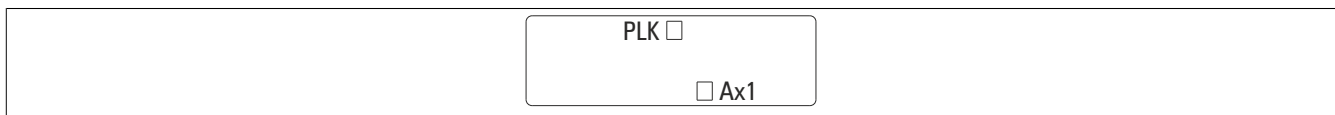


Figure 1: 8EI servo drives - Status indicators

#### 3.2 LED state during startup

The following intervals are used for the LED status indicators:

Width of box: 50 ms

Repeats after: 3,000 ms

| Status  | Ax1/Ax2/Ax3 | Display |
|---|-------------|---------|
| 1. Boot procedure for base hardware active          | Green       |         |
|   | Orange      |         |
|   | Red         |         |
| 2. Waiting for network telegram                     | Green       |         |
|   | Orange      |         |
|   | Red         |         |
| 3. Network communication active                     | Green       |         |
|   | Orange      |         |
|   | Red         |         |
| 4. ACOPOS operating system being transferred/burned | Green       |         |
|   | Orange      |         |
|   | Red         |         |
|   | Ax1/Ax2/Ax3 | PLK     |
| 5. Module booting                                   | Green       |         |
|   | Orange      |         |
|   | Red         |         |
| 6. Module ready for operation                       | Green       |         |
|   | Orange      |         |
|   | Red         |         |

Table 3: LED state during startup

#### 3.3 POWERLINK - LED status indicators

| Label | Color  | Description         |   |
|-------|--------|---------------------|---|
| PLK   | Green  | Blinking green (1x) | The client detects a valid POWERLINK frame on the network.  |
|       |        | Blinking green (2x) | Cyclic operation on the network, but the client itself is not yet in cyclic operation.                                |
|       |        | Blinking green (3x) | Cyclic operation of the client is in preparation.   |
|       |        | Solid green         | The client is in cyclic operation.  |
|       | Red    | Flickering green    | The client is not in cyclic operation and also does not detect any other stations on the network in cyclic operation. |
|       |        | Solid red           | The POWERLINK node number of the module is 0.   |
|       | Orange | Blinking red/green  | The client is in an error state (drops out of cyclic operation).  |
|       |        | Solid orange        | Module booting  |

Table 4: POWERLINK - LED status indicators

### 3.4 Ax1/Ax2/Ax3 - LED status indicators

| Label             | Color  | Function | Description    |  |
|-------------------|--------|----------|----------------|--|
| Ax1<br>Ax2<br>Ax3 | Green  | Ready    | Solid green    | The module is ready for operation and the power stage can be enabled (operating system present and booted, no pending permanent or temporary errors).  |
|                   |        |          | Blinking green | The module is not ready for operation.<br><b>Examples:</b> <ul style="list-style-type: none"> <li>No signal on one or both enable inputs</li> <li>DC bus voltage outside the tolerance range</li> <li>Overtemperature on the motor (temperature sensor)</li> <li>Motor feedback not connected or defective</li> <li>Motor temperature sensor not connected or defective</li> <li>Overtemperature on the module (IGBT junction, heat sink, etc.)</li> <li>Disturbance on network</li> </ul> |
|                   | Red    | Error    | Solid red      | There is a permanent error on the module.<br><b>Examples:</b> <ul style="list-style-type: none"> <li>Permanent overcurrent</li> <li>Invalid data in EPROM</li> </ul>   |
|                   |        |          | Blinking red   | Burning ACOPOS P3 operating system   |
|                   | Orange | Run      | Solid orange   | The module's power stage is enabled.   |
|                   | ---    | ---      | LED off        | No voltage being supplied to module  |

Table 5: Ax1/Ax2/Ax3 - LED status indicators



4 Installation

4.1 1-axis cold plate

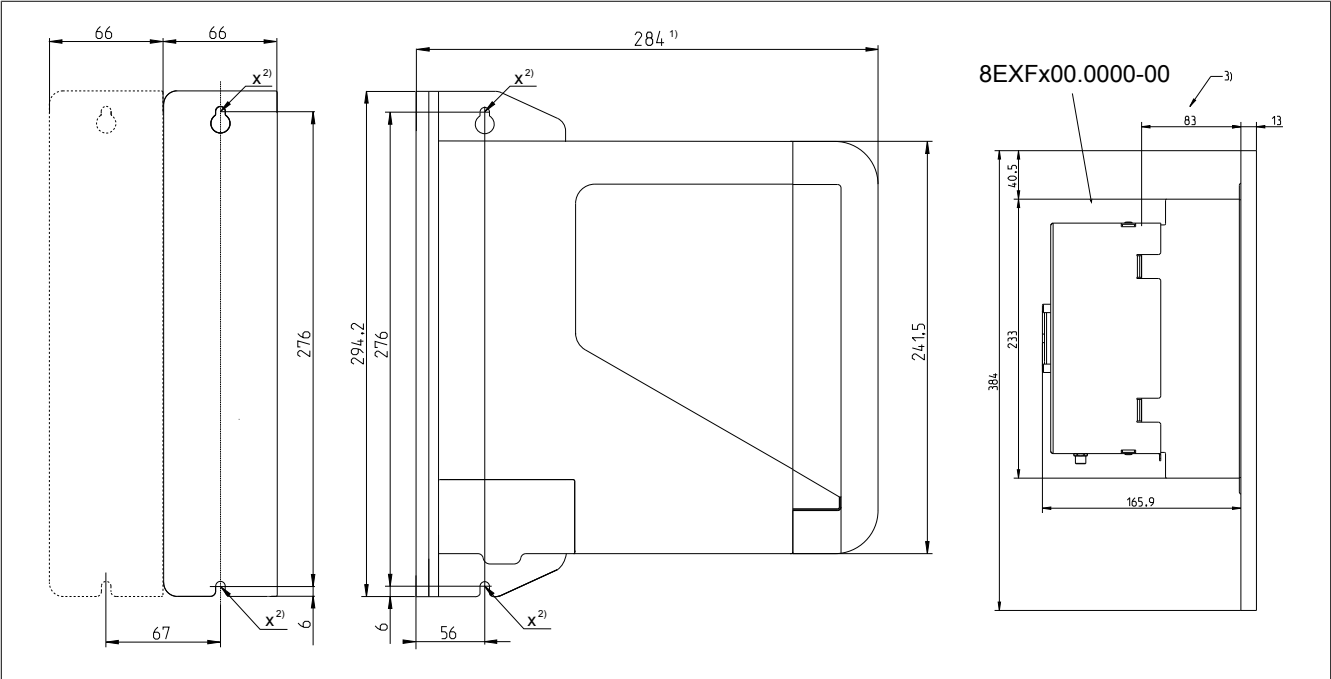


Figure 2: 1-axis module cold plate up to 4 kW - Dimension diagram

- 1) Without front cover: 281.5 mm
- 2) Hole for M5 screws.
- 3) Fin depth of the feed-through heat sink without installed fan 8EXFx00.0000-00

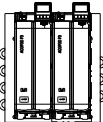
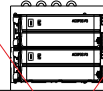
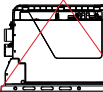
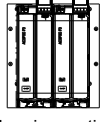

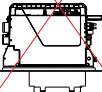
| Cold plate mounting   | Feed-through mounting   |
|---|---|
| <p><b>Permissible mounting orientations</b></p>  <p>Hanging vertically</p> <p><b>Impermissible mounting orientations</b></p>  <p>Standing horizontally</p>  <p>Horizontal, face up</p> | <p><b>Permissible mounting orientations</b></p>  <p>Hanging vertically</p> <p><b>Impermissible mounting orientations</b></p>  <p>Standing horizontally</p>  <p>Horizontal, face up</p> |

Table 6: Permissible and impermissible mounting orientations

Information:

When mounting ACOPOS P3 modules for cold-plate or feed-through mounting, be sure not to scratch the backplane. This can impair thermal dissipation to the mounting plate.

## 4.2 Installation dimensions

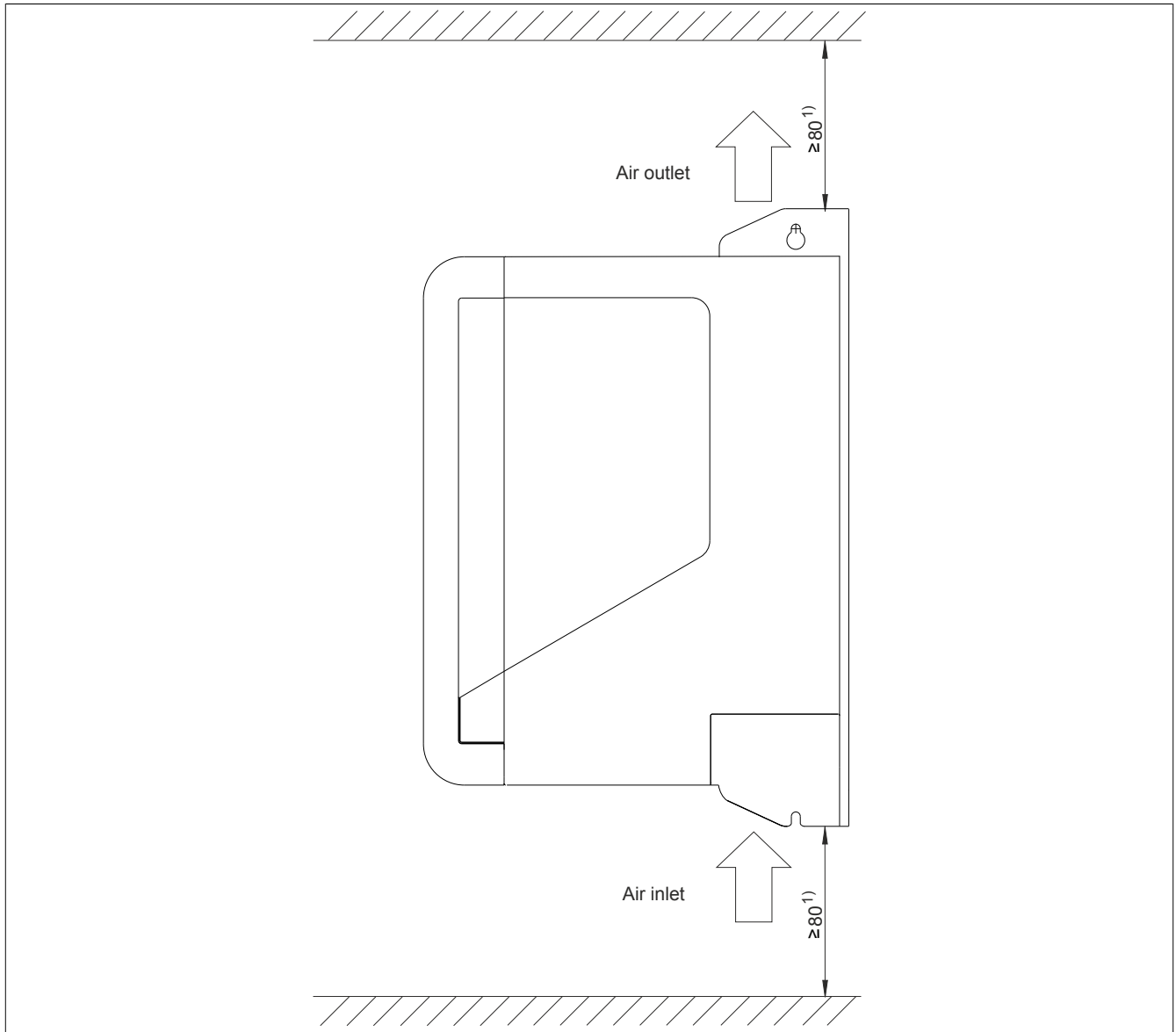


Figure 3: ACOPOS P3 8EI servo drives - Installation dimensions

- 1) For sufficient air circulation, a clearance of at least 80 mm must be provided above and below the module.  
 In order to connect display module 8EAD0000.000-1 to the module without problems, at least 100 mm clearance is necessary above the module.  
 In order to ensure easy wiring (taking all minimum bend radii into account), at least 200 mm clearance is necessary below the module.

### Caution!

**Cooling air exiting the 8EI servo drive can have a temperature up to 90°C. Any components installed near the air outlet must be designed to withstand these high temperatures!**



5.2 Connector X1 - Pinout

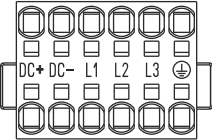
| X1  | Description | Function                    |
|---|-------------|-----------------------------|
|  | DC+         | DC bus connection DC+       |
|   | DC-         | DC bus connection DC-       |
|   | L1          | Mains connection L1         |
|   | L2          | Mains connection L2         |
|   | L3          | Mains connection L3         |
|   | PE          | Protective ground conductor |

Table 7: Connector X1 - Pinout

Warning!

Only DC bus circuits of 8EI servo drives with the same supply voltage range are permitted to be connected.

5.2.1 Mains connection

3x 200 - 480 VAC

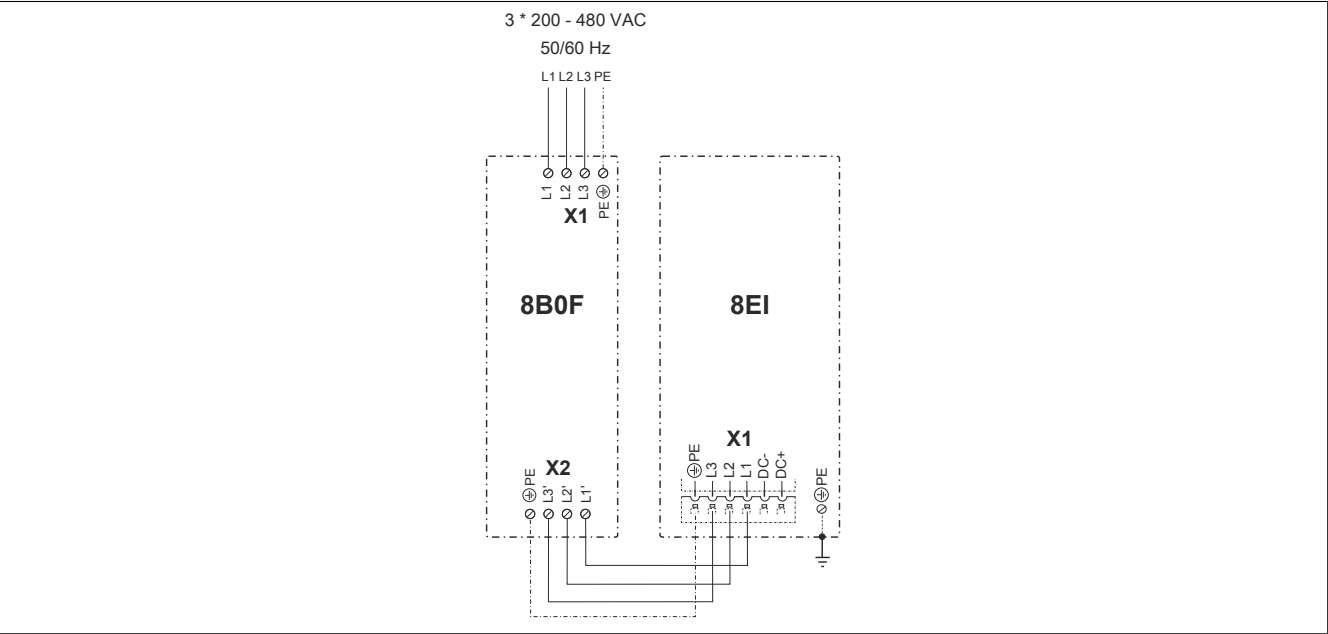


Figure 5: Mains connection 3x 200 - 480 VAC

5.3 Connector X2 - Pinout

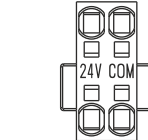
| X2  | Name | Function           |
|---|------|--------------------|
|  | COM  | 0 V power supply   |
|   | 24 V | +24 V power supply |

Table 8: Connector X2 - Pinout

## 5.4 Connectors X3A, X3B - Pinout

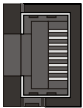
| <div>X3A, X3B</div>  | Pin | Name   | Function                 |
|---|-----|--------|--------------------------|
|   | 1   | RXD    | Receive signal           |
|   | 2   | RXD\   | Receive signal inverted  |
|   | 3   | TXD    | Transmit signal          |
|   | 4   | Shield | Shield                   |
|   | 5   | Shield | Shield                   |
|   | 6   | TXD\   | Transmit signal inverted |
|   | 7   | Shield | Shield                   |
|   | 8   | Shield | Shield                   |

Table 9: X3A, X3B connectors - Pinout

## 5.5 Connector X4x (digital multi-encoder interface) - Pinout

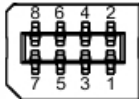
| X4x   | Pin | Name | Function depending on configured encoder type |     |      |          |                           |
|---|-----|------|---|-----|------|----------|---------------------------|
|   |     |      | EnDat 2.2                                     | SSI | BiSS | T-Format | HIPERFACE DSL             |
|  | 1   | U+   | Encoder power supply +                        |     |      |          | ---                       |
|   | 2   | T    | Clock output                                  |     |      |          | ---                       |
|   | 3   | ---  | Sense input +5 V <sup>1)</sup>                |     | ---  |          | HIPERFACE DSL             |
|   | 4   | T\   | Clock output inverted                         |     |      |          | ---                       |
|   | 5   | ---  | Sense input 0 V <sup>1)</sup>                 |     | ---  |          | HIPERFACE DSL<br>inverted |
|   | 6   | D    | Data  |     |      |          | ---                       |
|   | 7   | COM  | Encoder power supply 0 V                      |     |      |          | ---                       |
|   | 8   | D\   | Data inverted                                 |     |      |          | ---                       |

Table 10: Connector X4x - Pinout

1) Only if the encoder supply voltage (5 V) is configured accordingly.

## 5.6 Connector X5x - Pinout

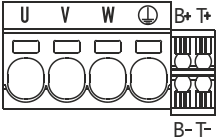
| X5x   | Name | Function                           |
|---|------|------------------------------------|
|  | B+   | Brake +                            |
|   | B-   | Brake -                            |
|   | T+   | Temperature sensor + <sup>1)</sup> |
|   | T-   | Temperature sensor - <sup>1)</sup> |
|   | PE   | Protective ground conductor        |
|   | U    | Motor connection U                 |
|   | V    | Motor connection V                 |
|   | W    | Motor connection W                 |

Table 11: Connector X5x - Pinout

1) A temperature sensor does not need to be connected when using a hybrid motor cable solution since the motor temperature is transferred digitally.

## Danger!

The connections for the motor temperature sensors and the motor holding brake are safely isolated circuits. As a result, only devices or components that have at least safe isolation per IEC 60364-4-41 or EN 61800-5-1 are permitted to be connected to these connections.

## Information:

B&R recommends wiring the ACOPOS P3 X5x motor connectors in the following order:

1. X51
2. X52
3. X53

## 5.7 Connector X6 - Pinout


| X6  | Name | Function                    |
|---|------|-----------------------------|
|  | PE   | Protective ground conductor |
|   | RB-  | Braking resistor -          |
|   | RB+  | Braking resistor +          |

Table 12: Connector X6 - Pinout

**Danger!**

During operation, the contacts of connector X6 carry dangerous voltages greater than 60 VDC. Touching one of these contacts can result in a life-threatening electric shock. This could result in death or severe injury.

For this reason, terminal block 8TB3103.222A-20 or 8TB4103.222A-10 must always be connected to connector X6 during operation.

**5.8 Connector X7 - Pinout**

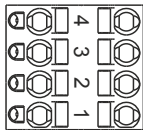
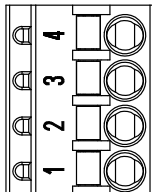
| X7  |   | Pin | Name     | Function     |
|---|---|-----|----------|--------------|
|  |  | 1   | Enable 1 | Enable 1     |
|   |   | 2   | COM (1)  | Enable 1 0 V |
|   |   | 3   | Enable 2 | Enable 2     |
|   |   | 4   | COM (2)  | Enable 2 0 V |

Table 13: Connector X7 - Pinout

**5.9 Connector X8 - Pinout**

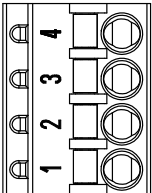
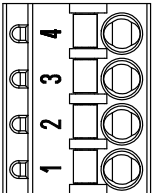
| X8   |  | Pin | Name      | Function      |
|--|--|-----|-----------|---------------|
|  |  | 1   | Trigger 1 | Trigger 1     |
|  |  | 2   | COM (1)   | Trigger 1 0 V |
|  |  | 3   | Trigger 2 | Trigger 2     |
|  |  | 4   | COM (2)   | Trigger 2 0 V |

Table 14: Connector X8 - Pinout

**5.10 Connector X10 - Pinout**

In preparation

## 6 Setting POWERLINK node numbers

ACOPOS P3 8EI servo drives do not have node number switches and are delivered with the node number set to 0.

There are 2 ways to set the node number:

- Setting with dynamic node allocation (DNA) in Automation Studio
- Setting with the 8EAD0000.000-1 display module

### Information:

If an ACOPOS P3 8EI servo drive is supplied with 24 VDC and its node number is set to 0, then LED "PLK" is lit solid red.

### Information:

Node numbers in the range 001 to 239 are permitted.

Node number 000 and in the range 240 to 255 are reserved and not permitted.

### Information:

A node number set using the 8EAD0000.000-1 display module is only applied the next time the 24 VDC power supply of the ACOPOS P3 8EI servo drive is switched back on.

### Setting with dynamic node allocation (DNA)

### Information:

The node number of the first ACOPOS P3 8EI servo drive in an ACOPOS P3 drive system can only be set using DNA if it is connected via POWERLINK directly to the controller or another POWERLINK-capable module (in DNA mode) that can switch hub ports (e.g. X20BC...).

If this is not the case, the node number of the first ACOPOS P3 8EI servo drive in an ACOPOS P3 drive system can only be set using the 8EAD000.0000-00 display module.

### Information:

Setting the node number using DNA only works on ACOPOS P3 8EI servo drives with node number 0 (factory setting).

See also section "Dynamic node allocation (DNA)" in Automation Help.

### Setting with the 8EAD0000.000-1 display module

See "Accessories / Display module 8EAD0000.000-1" in the ACOPOS P3 user's manual.