# 8EI017HWD10.XXXX-1

## 1 Order data

| Order number | Short description | Figure |
|---|---|---|
| | **Wall mounting** | |
| 8EI017HWD10.XXXX-1 | ACOPOS P3 servo drive, 1 digital multi-standard encoder interface per axis, 3x 200-480 VAC, 2x 17 A, 2 axis, wall mounting | |
| | **Optional accessories** | |
| | **Display modules** | |
| 8EAD0000.000-1 | Display module, LCD, 128 x 64, black/white, 1x USB 3.0 | |
| | **Front covers** | |
| 8EXA300.0010-00 | ACOPOS P3 cover, B&R orange, double-width, suitable for servo drives 8EI017xxDxx.xxxx-x / 8EI022xxDxx.xxxx-x / 8EI024xxSxx.xxxx-x / 8EI034xxSxx.xxxx-x / 8EI044xxSxx.xxxx-x | |
| 8EXA300.0020-00 | ACOPOS P3 cover, B&R dark gray, double-width, suitable for servo drives 8EI017xxDxx.xxxx-x / 8EI022xxDxx.xxxx-x / 8EI024xxSxx.xxxx-x / 8EI034xxSxx.xxxx-x / 8EI044xxSxx.xxxx-x | |
| | **Passive line filter** | |
| 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 | |
| | **Plug-in modules** | |
| 8EAC0122.001-1 | ACOPOS P3 plug-in module, resolver interface 10 kHz | |
| 8EAC0122.003-1 | ACOPOS P3 plug-in module, 3 resolver interfaces 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 | |
| 8EAC0150.003-1 | ACOPOS P3 plug-in module, 3 digital multi-encoder interfaces | |
| 8EAC0151.001-1 | ACOPOS P3 plug-in module, incremental encoder interface | |
| 8EAC0151.003-1 | ACOPOS P3 plug-in module, 3 incremental encoder interfaces | |
| 8EAC0152.001-1 | ACOPOS P3 plug-in module, analog multi-encoder interface | |
| 8EAC0152.003-1 | ACOPOS P3 plug-in module, 3 analog multi-encoder interfaces | |
| | **Shield component sets** | |
| 8SCSE01.0200-00 | ACOPOS P3 shield component set: 1x ACOPOS P3 shield mounting plate, 2x 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 | |
| | **Terminals** | |
| 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 | |
| 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 | |
| 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 | |
| 8TB4103.222A-10 | Push-in terminal block, 3-pin, 1-row, spacing: 10.16 mm, label 2: PE RB- RB+, A keying: 000 | |
| 8TB4104.222L-10 | Push-in terminal block, 4-pin, 1-row, spacing: 10.16 mm, label 2: PE L3 L2 L1, L keying: 1010 | |
| 8TB4104.227F-10 | Push-in terminal block, 4-pin, 1-row, spacing: 10.16 mm, label 4: DC-, DC-, DC+, DC+ F keying: 0101 | |
| 8TB4204.202L-10 | 4-pin push-in screw terminal block, 2-row, pitch: 10.16 mm, label 2: PE L3 L2 L1, coding L: 1010 | |

Table 1: 8EI017HWD10.XXXX-1 - Order data

# 2 Technical data

| Order number | 8EI017HWD10.XXXX-1 |
|---|---|
| **General information** | |
| Slots for plug-in modules | 1 |
| Certifications | |
|   CE | Yes |
|   UL | cULus E225616<br>Power conversion equipment |
|   EAC | Yes |
|   KC | In preparation |
| **Mains connection** | |
| 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. 26.4 kVA |
| Inrush current | 100 A |
| Switch-on interval | In preparation |
| Integrated line filter per EN 61800-3, category C3 | No [1] |
| Terminal connection cross section | |
|   Flexible and fine-stranded wires | |
|     With wire end sleeves | 0.75 to 16 mm² |
|   Approbation data | |
|     UL/C-UL-US | 20 to 4 AWG |
|     CSA | 20 to 4 AWG |
| Power dissipation at device nominal power without braking resistor | In preparation |
| Max. line length | 3 m [2] |
| **DC bus connection** | |
| Continuous power [3] | 14 kW [4] |
| Reduction of continuous power depending on mains voltage | |
|   Mains input voltage <3x 400 VAC | 14 kW * (Mains input voltage [V] / 400 V) |
| DC bus capacitance | 1680 µF |
| Terminal connection cross sections | |
|   Flexible and fine-stranded wires | |
|     With wire end sleeves | 0.75 to 16 mm² |
|   Approbation data | |
|     UL/C-UL-US | 20 to 4 AWG |
|     CSA | 20 to 4 AWG |
| Max. line length | 3 m [5] |
| **24 VDC power supply** | |
| Input voltage | 24 VDC ±25% |
| Input capacitance | 5500 µF |
| Current consumption | 2.4 A + Current for motor holding brake [6][7] |
| Terminal connection cross sections | |
|   Flexible and fine-stranded wires | |
|     With wire end sleeves | 0.25 to 4 mm² |
|   Approbation data | |
|     UL/C-UL-US | 24 to 8 AWG |
|     CSA | 24 to 8 AWG |
| Max. line length | 30 m |
| **Motor connection** | |
| Quantity | 2 |
| Continuous power per motor connection [8] | 7 / 7 kW [4] |
| Continuous current per motor connection [8] | 17 / 17 $A_{eff}$ |
| Reduction of continuous current depending on ambient temperature | |
|   Mains input voltage: 400 VAC | |
|     Switching frequency 5 kHz | No reduction [9] |
|     Switching frequency 10 kHz | 0.195 A/K (starting at 16°C) [9] |
|     Switching frequency 20 kHz | 0.145 A/K (starting at -59°C) [9] |
|   Mains input voltage: 480 VAC | |
|     Switching frequency 5 kHz | 0.345 A/K (starting at 44°C) [9] |
|     Switching frequency 10 kHz | 0.210 A/K (starting at -5°C) [9] |
|     Switching frequency 20 kHz | 0.145 A/K (starting at -87°C) [9] |
| Reduction of continuous current depending on installation elevation | |
|   Starting at 500 m above sea level | 1.7 $A_{eff}$ per 1000 m |
| Peak current per motor connection | 42.5 / 42.5 $A_{eff}$ |
| Peak power output | 17.5 / 17.5 kW |
| Nominal switching frequency | 5 kHz |
| Possible switching frequencies [10] | 5 / 10 / 20 kHz |

Table 2: 8EI017HWD10.XXXX-1 - Technical data

| Order number | 8EI017HWD10.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 [11] |
| 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 mm² |
|    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 [12] |
|    Switching frequency 10 kHz | 75 m [12] |
|    Switching frequency 20 kHz | 30 m [12] |
| **Motor holding brake connection** | |
| Quantity | 2 |
| Output voltage [13] | Depends on the input voltage on connector X2 |
| Continuous current | 4 A |
| Max. internal resistance | 0.25 Ω |
| Extinction potential | In preparation |
| Max. extinction energy per switching operation | In preparation |
| Max. switching frequency | In preparation |
| Protective measures | |
|    Overload and short-circuit protection | Yes |
|    Open circuit monitoring | Yes |
|    Undervoltage monitoring | Yes |
| Response threshold for open circuit monitoring | Max. 70 mA [14] |
| Response threshold for undervoltage monitoring | Approx. 23 V |
| Max. line length | In preparation |
| **Braking resistor [15]** | |
| Peak power output | 45 kW |
| Continuous power | 4 kW |
| Minimum braking resistance (ext.) | 13 Ω |
| Terminal connection cross section | |
|    Flexible and fine-stranded wires | |
|       With wire end sleeves | 0.75 to 16 mm² |
|    Approbation data | |
|       UL/C-UL-US | 20 to 4 AWG |
|       CSA | 20 to 4 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 |
| **Fieldbus** | |
| 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 |
| **Enable inputs** | |
| 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 [16] | 0.5 ms |

Table 2: 8EI017HWD10.XXXX-1 - Technical data

| Order number | 8EI017HWD10.XXXX-1 |
|---|---|
| Terminal connection cross sections | |
|     Flexible and fine-stranded wires | |
|         With plastic wire end sleeves | 0.25 to 2.5 mm² |
|     Approbation data | |
|         UL/C-UL-US | 26 to 12 AWG |
|         CSA | 26 to 12 AWG |
| Max. line length | 30 m |
| **Encoder interfaces** | |
| Quantity | 2 |
| Type | Digital multi-encoder interface, configurable [17] |
| Connections | 8-pin female Mini I/O connector |
| Status indicators | None [18] |
| 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 [19] |
| Encoder power supply | |
|     Output voltage | Configurable<br>Typ. 11.45 V ±0.1 V / 5.2 V ±0.1 V [20][21] |
|     Load capacity | Max. 300 mA |
|     Sense lines | 2, compensation of max. 2x 0.7 V |
|     Protective measures | |
|         Short-circuit proof | Yes |
|         Overload-proof | Yes |
| Synchronous serial interface | |
|     Signal transmission | RS485 [22] |
|     Data transfer rate | Depends on the configured encoder type |
|     Differential voltage [23] | |
|         Minimum | 2.0 V |
|         Maximum | 6.0 V |
| Max. power consumption per encoder interface | $P_{ENCODER}$ [W] = $U_{24V}$ [V] * ($I_{ENCODER}$ [A] * 0.7) + 0.5 W [24] |
| **Trigger inputs** | |
| 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 mm² |
|     Approbation data | |
|         UL/C-UL-US | 26 to 12 AWG |
|         CSA | 26 to 12 AWG |
| Max. line length | 100 m |
| **Support** | |
| Motion system | |
|     mapp Motion | 5.03.0 and higher |
|     ACP10/ARNC0 | 3.17.0 and higher |
| **Operating conditions** | |
| Permissible mounting orientations | |
|     Hanging vertically | Yes |
|     Standing horizontally | Yes |
| 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 [25] |

Table 2: 8EI017HWD10.XXXX-1 - Technical data

| Order number | 8EI017HWD10.XXXX-1 |
|---|---|
| **Ambient conditions** | |
| Temperature | |
|    Operation | |
|       Minimum | -25°C [26] |
|       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 |
| **Mechanical properties** | |
| Dimensions | |
|    Width | 133 mm |
|    Height | 374 mm |
|    Depth | |
|       Wall mounting | 258.5 mm (with 8EXA front cover: 261 mm) |
| Weight | 8 kg |

Table 2: 8EI017HWD10.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...).
   In extreme cases, using line filters from 3rd-party manufacturers can result in irreparable damage to the ACOPOS P3 8EI servo drive.
2) Maximum line length between line filter and mains connection on the module.
3) Valid for mains input voltage ≥3x 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.
4) The continuous power is reduced as a percentage of the continuous current if the continuous current is subject to derating.
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) At nominal 24 VDC supply voltage and 20 kHz switching frequency. Without plug-in card.
8) 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.
9) The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which derating of the continuous current must be taken into account, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
10) B&R recommends operating the module at its nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases CPU utilization.
11) 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").
12) The sum of the cable lengths of all motor cables connected to this module is not permitted to exceed this value.
13) 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.
14) Valid for modules with 8ZEL... starting with revision E0.
15) This values apply to an external braking resistor. This module is not equipped with an internal braking resistor.
16) OSSD (output signal switching device) signals are used to monitor supply lines for short circuits and cross faults.
17) The encoder type is not predefined from the factory. The encoder type necessary in each case must be configured in Automation Studio.
18) The direction of rotation of the encoder can be displayed on the 8EAD0000.000-1 display module.
19) Maximum encoder cable length $l_{max}$ can be calculated as follows (the maximum permissible encoder cable length of 75 m is not permitted to exceeded):

   $l_{max} = f / I_G * A * 1/(2*\rho)$

   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 [mm²]
   $\rho$ ... Specific resistance [Ω mm²/m] (e.g. for copper: $\rho$ = 0.0178)
20) 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.
21) 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 8EIxxxxxD... 2-axis modules and 8EIxxxxxT... 3-axis modules)
   - ACOPOS operating system 3.17.0 and higher (for 8EIxxxxxS... 1-axis modules)
22) Except encoder type HIPERFACE DSL.
23) Values valid for clock output and data input. Except encoder type HIPERFACE DSL.
24) $I_{ENCODER}$ ... Current consumption of the encoder
   $U_{24V}$ ... Input voltage on the +24 VDC input of the module
25) 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.
26) Only permitted for modules with 8ZEL... Revision E0 and higher. See the device information on the left side cover of the module. During storage or transport, sudden temperature changes may cause condensation or icing in the module. The module is only permitted to be commissioned if it is free of condensation or icing at the time of commissioning.
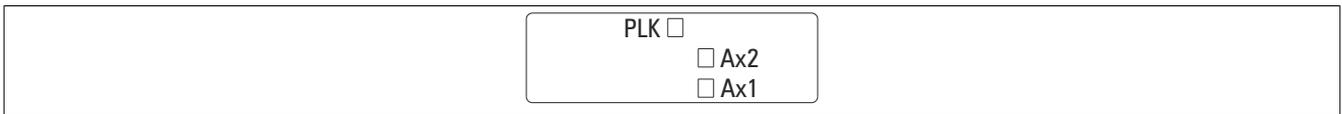
# 3 Status indicators

## 3.1 2-axis modules

```
                          PLK □
                             □ Ax2
                             □ Ax1
```

Figure 1: 8EI servo drives - Status indicators

## 3.2 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. |
| | | Flickering green | The client is not in cyclic operation and also does not detect any other stations on the network in cyclic operation. |
| | Red | Solid red | The POWERLINK node number of the module is 0. |
| | | Blinking red/green | The client is in an error state (drops out of cyclic operation). |
| | Orange | Solid orange | Module booting |

Table 3: POWERLINK - LED status indicators

## 3.3 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>**Examples:**<br>• No signal on one or both enable inputs<br>• DC bus voltage outside the tolerance range<br>• Overtemperature on the motor (temperature sensor)<br>• Motor feedback not connected or defective<br>• Motor temperature sensor not connected or defective<br>• Overtemperature on the module (IGBT junction, heat sink, etc.)<br>• Disturbance on network |
| | Red | Error | Solid red | There is a permanent error on the module.<br>**Examples:**<br>• Permanent overcurrent<br>• Invalid data in EPROM |
| | | | 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 4: Ax1/Ax2/Ax3 - LED status indicators

## 3.4 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 | | ▮ (continuously red) |
| 2. Waiting for network telegram | Green | | |
| | Orange | | |
| | Red | | ▮ (brief red pulse at start and near end) |
| 3. Network communication active | Green | | |
| | Orange | | |
| | Red | | ▮ (red, with gaps at start and end) |
| 4. ACOPOS operating system being transferred/burned | Green | | |
| | Orange | | |
| | Red | | ▮ (intermittent red flashing) |
| | **Ax1/Ax2/Ax3** | **PLK** | |
| 5. Module booting | Green | | |
| | Orange | | ▮ (continuously orange) |
| | Red | | |
| 6. Module ready for operation | Green | | ▮ (continuously green) |
| | Orange | | |
| | Red | | |

Table 5: LED state during startup

# 4 Installation

## 4.1 Dimension diagram for double-width modules
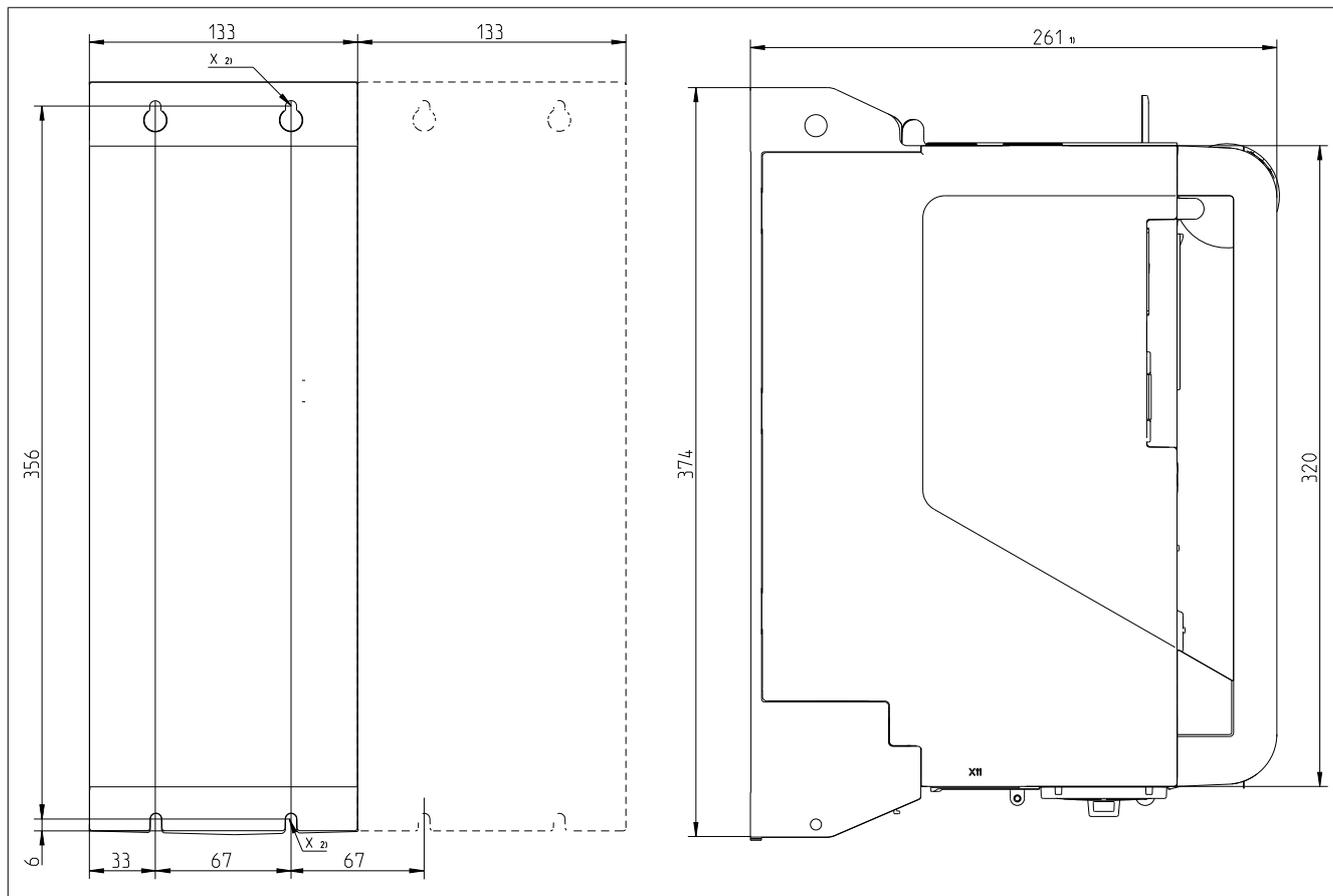


Figure 2: Dimension diagram for double-width modules

1) Without front cover: 258.5 mm
2) Hole for M5 screws.

## 4.2 Installation dimensions
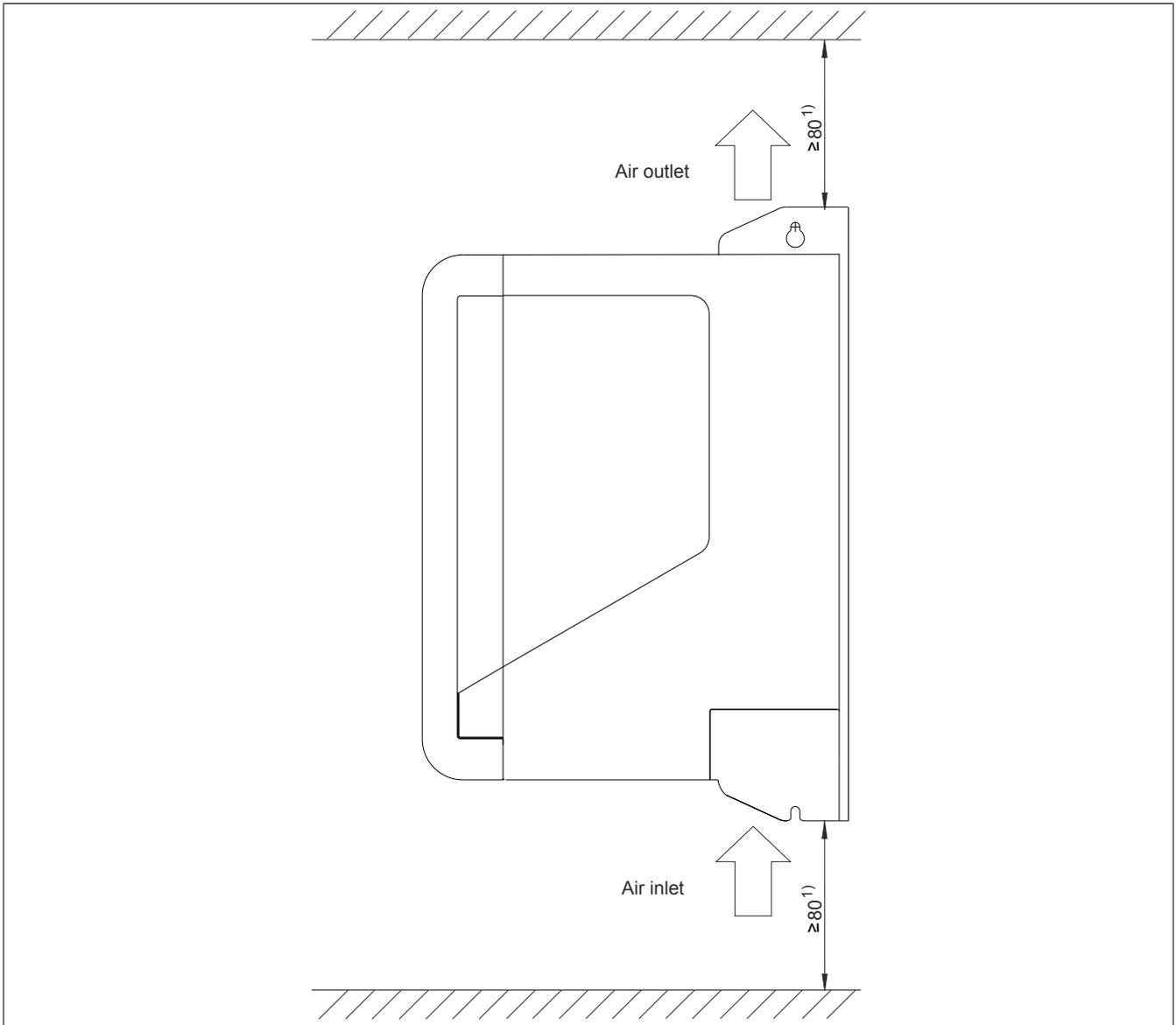


Figure 3: ACOPOS P3 8EI servo drives - Installation dimensions

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 Wiring

## 5.1 Pinout overview
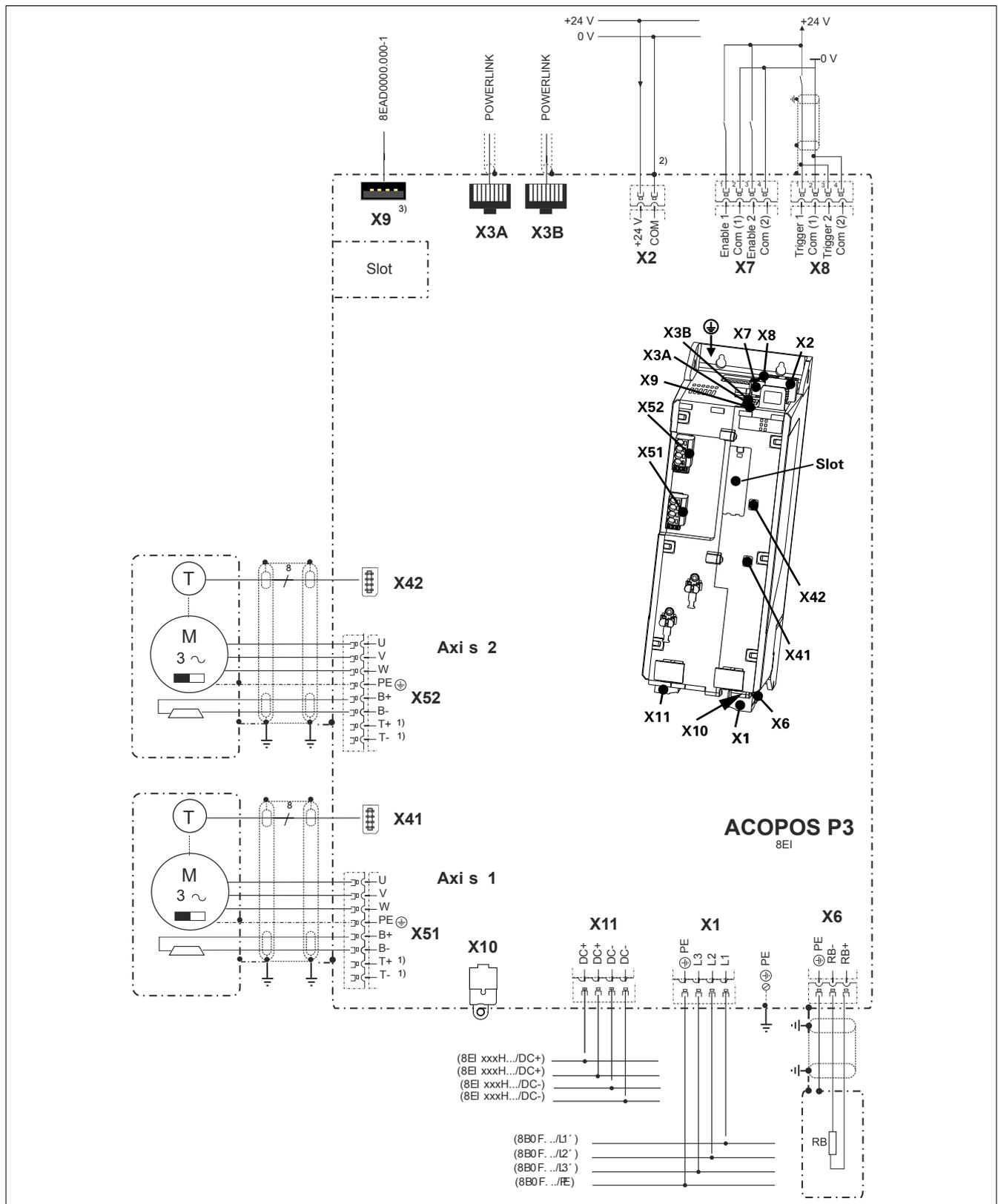


Figure 4: Mains input voltage - 3x 200 to 480 VAC

1)  A temperature sensor does not need to be connected when using 8ECHxxx hybrid motor cables since the motor temperature is transferred digitally.
2)  The COM connection on connector X2 must be grounded to achieve a defined relationship between the signal ground and ground potential!
3)  Only 8EAD0000.000-1 display modules are permitted to be connected to connector X9!

## 5.2 Connector X1 - Pinout
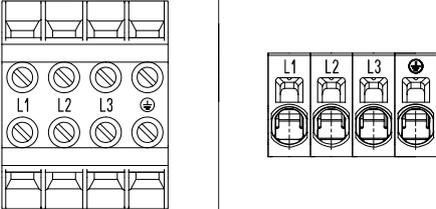
| X1 | | Description | Function |
|---|---|---|---|
| | | L1 | Mains connection L1 |
| | | L2 | Mains connection L2 |
| | | L3 | Mains connection L3 |
| | | PE | Protective ground conductor |
| | | | |
| | | Tightening torque for the terminal screws [Nm]: 1.7 to 18 (2-row connectors only) | |

Table 6: Connector X1 - Pinout

## Information:

**Strain relief is required for the cable when using the 2-row connector.**

## Danger!

**During operation, the contacts of connector X1 carry a high voltage if connector X11 is connected. 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 8TB3106.222B-20, 8TB3106.223C-20, 8TB3206.222B-40, 8TB3206.223C-40, 8TB4104.222L-10 or 8TB4204.202L-10 must always be connected to connector X1 during operation.**

### 5.2.1 Mains connection
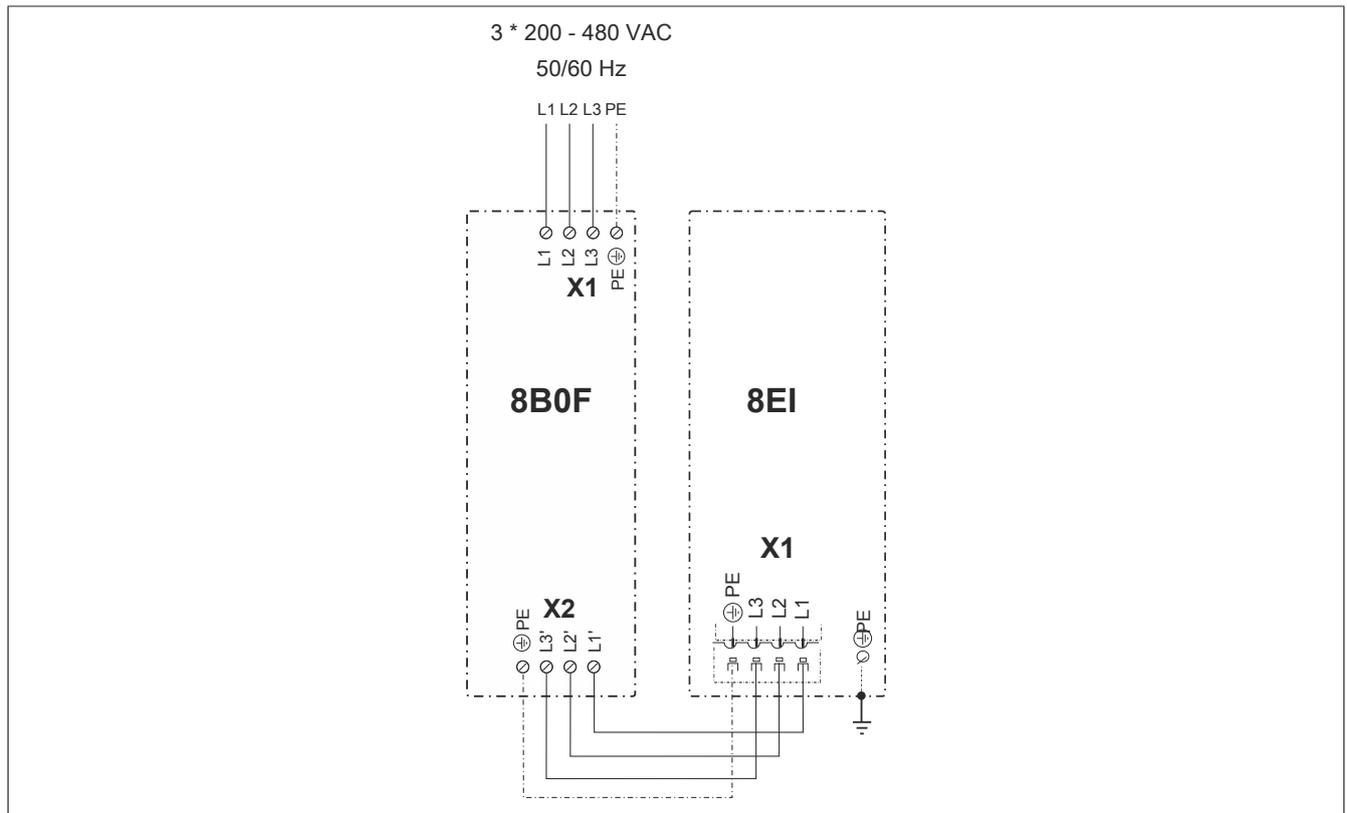
**3x 200 - 480 VAC**



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 7: Connector X2 - Pinout

## 5.4 Connector X3A, X3B - Pinout

| X3A, X3B | 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 |
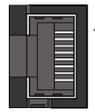
Table 8: X3A, X3B connectors - Pinout

## 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 [1] | | --- | HIPERFACE DSL |
| | 4 | T\ | Clock output inverted | | | --- | --- |
| | 5 | --- | --- | Sense input 0 V [1] | | --- | HIPERFACE DSL inverted |
| | 6 | D | Data | | | | --- |
| | 7 | COM | Encoder power supply 0 V | | | | --- |
| | 8 | D\ | Data inverted | | | | --- |
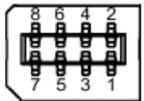
Table 9: Connector X4x - Pinout

[1]   Only if the encoder supply voltage (5 V) is configured accordingly.
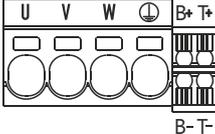
## 5.6 Connector X5x - Pinout

| X5x | Name | Function |
|---|---|---|
| | B+ | Brake + |
| | B- | Brake - |
| | T+ | Temperature sensor + [1] |
| | T- | Temperature sensor - [1] |
| | PE | Protective ground conductor |
| | U | Motor connection U |
| | V | Motor connection V |
| | W | Motor connection W |

Table 10: 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:**
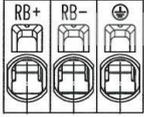
1. **X51**
2. **X52**
3. **X53**

## 5.7 Connector X6 - Pinout

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

Table 11: 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.**
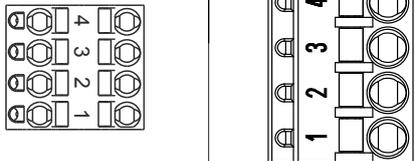
## 5.8 Connector X7 - Pinout

| 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 |

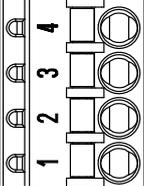Table 12: Connector X7 - Pinout

## 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 13: Connector X8 - Pinout

## 5.10 Connector X10 - Pinout
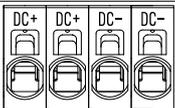
In preparation

## 5.11 Connector X11 - Pinout

| X11 | Description | Function |
|---|---|---|
| | DC+ | DC bus connection DC+ |
| | DC+ | DC bus connection DC+ |
| | DC- | DC bus connection DC- |
| | DC- | DC bus connection DC- |

Table 14: Connector X11 - Pinout

# Danger!

**During operation, the contacts of connector X11 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 8TB4104.227F-10 must always be connected to connector X11 during operation.**

# Warning!

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