# 6. 8BVP power supply modules

## 6.1 Order data

| Model number | Short description | Figure |
|---|---|---|
| | **Wall mounting** |  8BVP0880HC00.000-1 |
| 8BVP0220HW00.000-1 | ACOPOSmulti power supply module 22A, HV, wall mounting | |
| 8BVP0440HW00.000-1 | ACOPOSmulti power supply module 44A, HV, wall mounting | |
| 8BVP0880HW00.000-1 | ACOPOSmulti power supply module 88 A, HV, wall mounting | |
| | **Cold plate or feed-through mounting** | |
| 8BVP0220HC00.000-1 | ACOPOSmulti power supply module 22A, HV, cold plate or feed-through mounting | |
| 8BVP0440HC00.000-1 | ACOPOSmulti power supply module 44A, HV, cold plate or feed-through mounting | |
| 8BVP0880HC00.000-1 | ACOPOSmulti power supply module 88A, HV, cold plate or feed-through mounting | |

Table 20: Order data - 8BVP power supply modules

| Required accessories | | | | |
|---|---|---|---|---|
| **Model number** | **Amount** | **Short description** | **Comment** | **Page** |
| 8TB2106.2010-00 | 1 | Screw terminal 6 pins, 1 row RM5.08<br>Label 1: numbered serially | Plug for X1 connection | 276 |
| 8TB2108.2010-00 | 1 | Screw terminal 8 pins, 1 row RM5.08<br>Label 1: numbered serially | Plug for X2 connection | 276 |
| 8TB2104.204A-00 | 1 | Screw terminal 4 pins, 1 row RM5.08<br>Label 4: T- T+ F- F+<br>Coding A: 0000 | Plug for X4A connection | 276 |
| 8TB4104.202L-10 [1)] | 1 | Screw terminal 4 pins, 1 row RM10.16<br>Label 2: L1 L2 L3 PE<br>Coding N: 1010 | Plug for X5A connection | 276 |

Table 21: Required accessories - 8BVP power supply modules

1) Only for 8BVP0220Hx00.000-1 und 8BVP0440Hx00.000-1.

| Optional accessories | | | | |
|---|---|---|---|---|
| **Model number** | **Amount** | **Short description** | **Comment** | **Page** |
| 8BAC0120.000-1 | max. 2 | ACOPOSmulti plug-in module, EnDat 2.1 interface | --- | 99 |
| 8BAC0120.001-1 | max. 2 | ACOPOSmulti plug-in module, EnDat 2.2 interface | --- | --- |
| 8BAC0122.000-1 | max. 2 | ACOPOSmulti plug-in module, Resolver interface | --- | 107 |
| 8BAC0124.000-1 | max. 2 | ACOPOSmulti plug-in module, SinCos interface | --- | 127 |
| 8SCS005.0000-00 | Up to 2 | Shield component set consisting of:<br>1 slot cover shield sheet | Shield sheet for covering free plug-in module slots | --- |
| 8SCS002.0000-00 | 1 | Shield component set consisting of:<br>1 clamping plate<br>2 clamps D 4-13.5mm<br>2 screws | Shield component set for I/O cable with a cable diameter of 4 - 13.5 mm | --- |
| 8SCS008.0000-00 [1] | 1 | Shield component set consisting of:<br>1 shield plate, 2x, type 0<br>1 hose clamp, W 9mm, D 23-35mm | Shield component set for power cables with a diameter of 23 - 35 mm | --- |
| 8SCS003.0000-00 [2] | 1 | Shield component set consisting of:<br>1 shield mounting plate, 4x, 45°<br>8 screws | Base plate for mounting shield component set 8SCS001.0000-00 or 8SCS004.0000-00 | --- |
| 8SCS004.0000-00 [2] | 1 | Shield component set consisting of:<br>1 shield plate, 4x, type 0<br>2 hose clamps, W 9mm, D 32-50mm | Shield component set for power cables with a diameter of 32 - 50 mm | --- |
| 8SCS001.0000-00 [2] | 3 | Shield component set consisting of:<br>1 shield plate, 4x, type 1<br>1 hose clamp, W 9mm, D 12-22mm | Shield component set for individual wires with a diameter of 12 - 22 mm | --- |
| 8SCS007.0000-00 [1] | 1 | Shield component set consisting of:<br>1 shield mounting plate, 2x, 45°<br>4 screws | Base plate for mounting shield component set 8SCS008.0000-00 | --- |
| 8BXF001.0000-00 | --- | ACOPOSmulti fan module<br>Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K) | Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K) | --- |

Table 22: Optional accessories - 8BVP power supply modules

1) Only for 8BVP0220Hx00.000-1 und 8BVP0440Hx00.000-1.

2) Only for 8BVP0880Hx00.000-1.

## 6.2 Technical data

| **Product ID**<br>**Wall mounting**<br>**Cold plate or feed-through mounting** | **8BVP0220HW00.000-1**<br>**8BVP0220HC00.000-1** | **8BVP0440HW00.000-1**<br>**8BVP0440HC00.000-1** | **8BVP0880HW00.000-1**<br>**8BVP0880HC00.000-1** |
|---|---|---|---|
| **General information** | | | |
| C-UL-US listed | In preparation | Yes | |
| Available cooling and mounting methods<br>Wall mounting<br>Cold plate or feed-through mounting | Yes<br>Yes | | |
| Module width | 2 | | 4 |
| **Power mains connection** | | | |
| Mains input voltage | 3x220 to 3x480VAC ±10% | | |
| System configuration | TT, TN-S, TN-C-S | | |
| Frequency | 50 / 60 Hz ± 4% | | |
| Installed load | In preparation | | |
| Starting current at 400 VAC | In preparation | | |
| Switch-on interval | > 10 s | | |
| Max. chargeable DC bus capacitance | 4 mF | | 8 mF |
| Rated switching frequency | 5 kHz | | |
| Possible switching frequencies[1)] | 5 / 10 kHz | | |
| Integrated line filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A) | No | | |
| Integrated regeneration choke | No | | |
| Capable of regeneration | Yes | | |
| Power Factor Control (PFC) | Yes | | |
| Design<br>L1, L2, L3, PE<br>PU<br>Shield connection | Connectors<br>Threaded bolt M5<br>Yes [2)] | | Threaded bolt M8<br>No<br>Yes [2)] |
| Terminal connection cross sections<br>Flexible and fine wire lines<br>with wire tip sleeves<br>Approbation data<br>UL/C-UL-US<br>CSA | <br><br>0.5 - 16 mm²<br><br>20 - 6<br>20 - 6 | | <br><br>6 - 50 mm² [3)]<br><br>In preparation<br>In preparation |
| Terminal cable outer-cross-section dimension of the shield connection | 23 - 35 mm | | 32 - 50 mm |

Table 23: Technical data -8BVP power supply modules

| Product ID<br>Wall mounting<br>Cold plate or feed-through mounting | 8BVP0220HW00.000-1<br>8BVP0220HC00.000-1 | 8BVP0440HW00.000-1<br>8BVP0440HC00.000-1 | 8BVP0880HW00.000-1<br>8BVP0880HC00.000-1 |
|---|---|---|---|
| **DC bus connection** | | | |
| Voltage<br>Max. | 800 VDC<br>900 VDC | | |
| Continuous power (supply and regeneration) [4] | 15 kW | 30 kW | 60 kW |
| Reduction of continuous power depending on mains input voltage<br>Mains input voltage < 3x400 VAC | 37.5 W *<br>(400 - mains input voltage) | 75 W *<br>(400 - mains input voltage) | 150 W *<br>(400 - mains input voltage) |
| Reduction of continuous power depending on switching frequency and cooling method [5]<br>Switching frequency 10 kHz<br>Wall mounting[6]<br>Installing the cold plate[7]<br>Feed-through mounting<br>Switching frequency 5 kHz<br>Wall mounting[6]<br>Installing the cold plate[7]<br>Feed-through mounting | <br><br>0.27 kW/K (from 31°C)<br>0.33 kW/K (from 49°C)<br>In preparation<br><br>**No reduction**<br>**No reduction**<br>In preparation | <br><br>0.35 kW/K (from -10°C) [8]<br>0.43 kW/K (from 6°C) [9]<br>In preparation<br><br>**1.11 kW/K (from 40°C)**<br>**0.56 kW/K (from 45°C)**<br>In preparation | <br><br>0.64 kW/K (from -5°C) [8]<br>0.95 kW/K (from 27°C)<br>In preparation<br><br>**0.97 kW/K (from 41°C)**<br>**1.3 kW/K (from 58°C)**<br>In preparation |
| Reduction of continuous power depending on installation altitude<br>Starting at 500 m above sea level | 1.5 kW per 1000 m | 3 kW per 1000 m | 6 kW per 1000 m |
| Peak power (supply and regeneration) | 37.5 kW | 60 kW | 120 kW |
| Power loss at max. device power | In preparation | In preparation | In preparation |
| DC bus capacitance | 495 µF | 825 µF | 1650 µF |
| Protective measures<br>Overload protection<br>Short circuit and ground fault | <br>Yes<br>No | | |
| Design | ACOPOSmulti backplane | | |
| **24 VDC supply [10]** | | | |
| Input voltage | 25 VDC ±1.6% | | |
| Input capacitance | 4.7 µF | | |
| Max. power consumption | $P_{24\ V\ Out}$ {0 ... 10 W} [11] + $P_{Fan8BVF...}$ [12] + 2 * $P_{Fan8B0M...}$ [13] | | $P_{24\ V\ Out}$ {0 ... 10 W} [11] + $P_{Fan8BVF...}$ [12] + 4 * $P_{Fan8B0M...}$ [13] |
| Design | ACOPOSmulti backplane | | |
| **Line filter fan connection** | | | |
| Output voltage | 24V +5.8 / -0.1% | | |
| Continuous current | 4.2 A | | |
| Protective measures<br>Overload protection<br>Short circuit protection<br>Cable breakage monitoring<br>Undervoltage monitoring | <br>No<br>Yes<br>No<br>No | | |
| Max. over-current limitation | 10 A | | |

Table 23: Technical data -8BVP power supply modules (Forts.)

| Product ID<br>Wall mounting<br>Cold plate or feed-through mounting | 8BVP0220HW00.000-1<br>8BVP0220HC00.000-1 | 8BVP0440HW00.000-1<br>8BVP0440HC00.000-1 | 8BVP0880HW00.000-1<br>8BVP0880HC00.000-1 |
|---|---|---|---|
| **Trigger inputs** | | | |
| Number of inputs | 2 | | |
| Wiring | Sink | | |
| Electrical isolation<br>Input - Power supply module<br>Input - Input | <br>Yes<br>Yes | | |
| Input voltage<br>Rated<br>Maximum | <br>24 VDC<br>30 VDC | | |
| Switching threshold<br>LOW<br>HIGH | <br><5 V<br>>15 V | | |
| Input current at rated voltage | Approx. 10 mA | | |
| Switching delay<br>Positive edge<br>Negative edge | <br>52 µs ± 0.5 µs (digitally filtered)<br>53 µs ± 0.5 µs (digitally filtered) | | |
| Modulation compared to ground potential | Max. ±38 V | | |
| **24 V Out** | | | |
| Amount | 2 | | |
| Output voltage<br>DC bus voltage 260 ... 315 VDC<br>DC bus voltage 315 ... 900 VDC | <br>25 VDC * (DC bus voltage / 315)<br>24 VDC ±6% | | |
| Fuse protection | 500 mA (slow-blow) electronic,<br>automatic reset | | |
| **Operational conditions** | | | |
| Ambient temperature during operation<br>Max. ambient temperature [14)] | 5 to 40°C<br>+55°C | | |
| Relative humidity during operation | 5 to 85%, non-condensing | | |
| Installation at altitudes above sea level<br>Maximum installation altitude [15)] | 0 to 500 m<br>4000 m | | |
| Degree of pollution according to EN 60664-1 | 2 (non-conductive material) | | |
| Overvoltage cat. according to<br>IEC 60364-4-443:1999 | III | | |
| EN 60529 protection | IP20 | | |
| **Storage and transport conditions** | | | |
| Storage temperature | -25 to +55°C | | |
| Relative humidity during storage | 5 to 95%, non-condensing | | |
| Transport temperature | -25 to +70°C | | |
| Relative humidity during transport | 95% at +40°C | | |

Table 23: Technical data -8BVP power supply modules (Forts.)

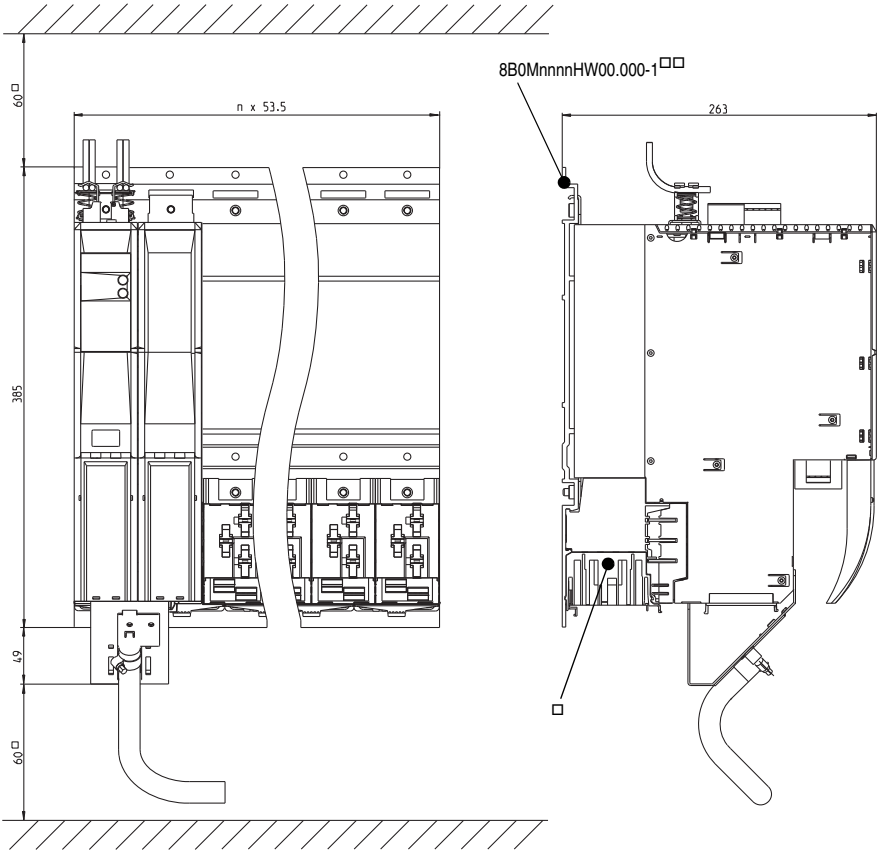
| Product ID<br>Wall mounting<br>Cold plate or feed-through mounting | 8BVP0220HW00.000-1<br>8BVP0220HC00.000-1 | 8BVP0440HW00.000-1<br>8BVP0440HC00.000-1 | 8BVP0880HW00.000-1<br>8BVP0880HC00.000-1 |
|---|---|---|---|
| **Mechanical characteristics** | | | |
| Dimensions[16)] | | | |
| Width | 106.5 mm | | 213.5 mm |
| Height | 317 mm | | 317 mm |
| Depth | | | |
| Wall mounting | 263 mm | | 263 mm |
| Cold-plate | 212 mm | | 212 mm |
| Feed-through mounting | 209 mm | | 209 mm |
| Weight | | | |
| Wall mounting | Approx. 5.2 kg | Approx. 5.5 kg | Approx. 10.2 kg |
| Cold-plate | Approx. 4.2 kg | Approx. 4.5 kg | Approx. 7.9 kg |
| Feed-through mounting | Approx. 4.2 kg | Approx. 4.5 kg | Approx. 7.9 kg |

Table 23: Technical data -8BVP power supply modules (Forts.)

1) B&R recommends operating the module at nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous power and increases the CPU load.
2) The cable does not require shielding up to a total cable length between the line filter, regeneration choke and power supply module of 3 m. Please contact B&R when using cable lengths > 3 m.
3) The connection is made with cable lugs using an M8 threaded bolt.
4) Valid in the following conditions: 40°C ambient temperature, installation altitude < 500 m above sea level.
5) Valid in the following conditions: Nominal DC bus voltage 800 VDC, minimum permissible coolant flow volume (3 l/min). The nominal switching frequency values for the respective ACOPOSmulti inverter module are marked in bold.
6) The temperature specifications are based on the ambient temperature.
7) The temperature specifications are based on the return temperature of the cold plate mounting plate.
8) The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which a derating of the continuous current must be accounted for, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
9) The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which a derating of the continuous current must be accounted for, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

   **Caution! Condensation can occur at low flow-temperatures and low return-temperatures. The designs in the section "Condensation" on page 203 must be taken into consideration!**
10) In the power supply modules a DC bus power supply is integrated for the electronic supply. The 24 VDC supply from the ACOPOSmulti backplane only feeds the +24 VDC of the trigger inputs and the encoder power supplies on the encoder modules.
11) The power consumption $P_{24\ V\ Out}$ corresponds to the power that is output on the module's X2 / +24 V Out 1 and X2 / +24 V Out 2 connections (max. 10 W).
12) The power consumption $P_{Fan8BVF...}$ corresponds to the portion of the power that is output on the X4A / F- and X4A / F+ connectors on the module and can be found in the technical data for the respective line filter 8BVF... (fan connection).
13) The power consumption $P_{Fan8B0M...}$ corresponds to the portion of the power that is used by the fan modules in the mounting plate / by the 8B0M0040HFF0.000-1 fan module and can be found in the technical data for the respective 8B0M... mounting plate.
14) Continuous operation of ACOPOSmulti power supply modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.
15) Continuous operation of ACOPOSmulti power supply modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.
16) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the device for mounting, connections and air circulation (see section 2 "Dimension diagrams and installation dimensions" on page 143).

### 2.4.2 Power supply module 8BVP0220HW00.000-1, 8BVP0440HW00.000-1




n ... Number of width units of the mounting plate

□ ... For proper air circulation, at least 60 mm has to be left free above and below the module.
**To ensure that the fan modules in the mounting plate can be exchanged easily, at least 250 mm has to be left free below the module.**

□□ ... nnnn indicates the number of slots (0160 equals 16 slots)

Figure 23: Dimensional diagram and installation dimensions for 8BVP0220HW00.000-1, 8BVP0440HW00.000-1

# 4. 8BVP power supply modules

## 4.1 8BVP0220Hx00.000-1, 8BVP0440Hx00.000-1

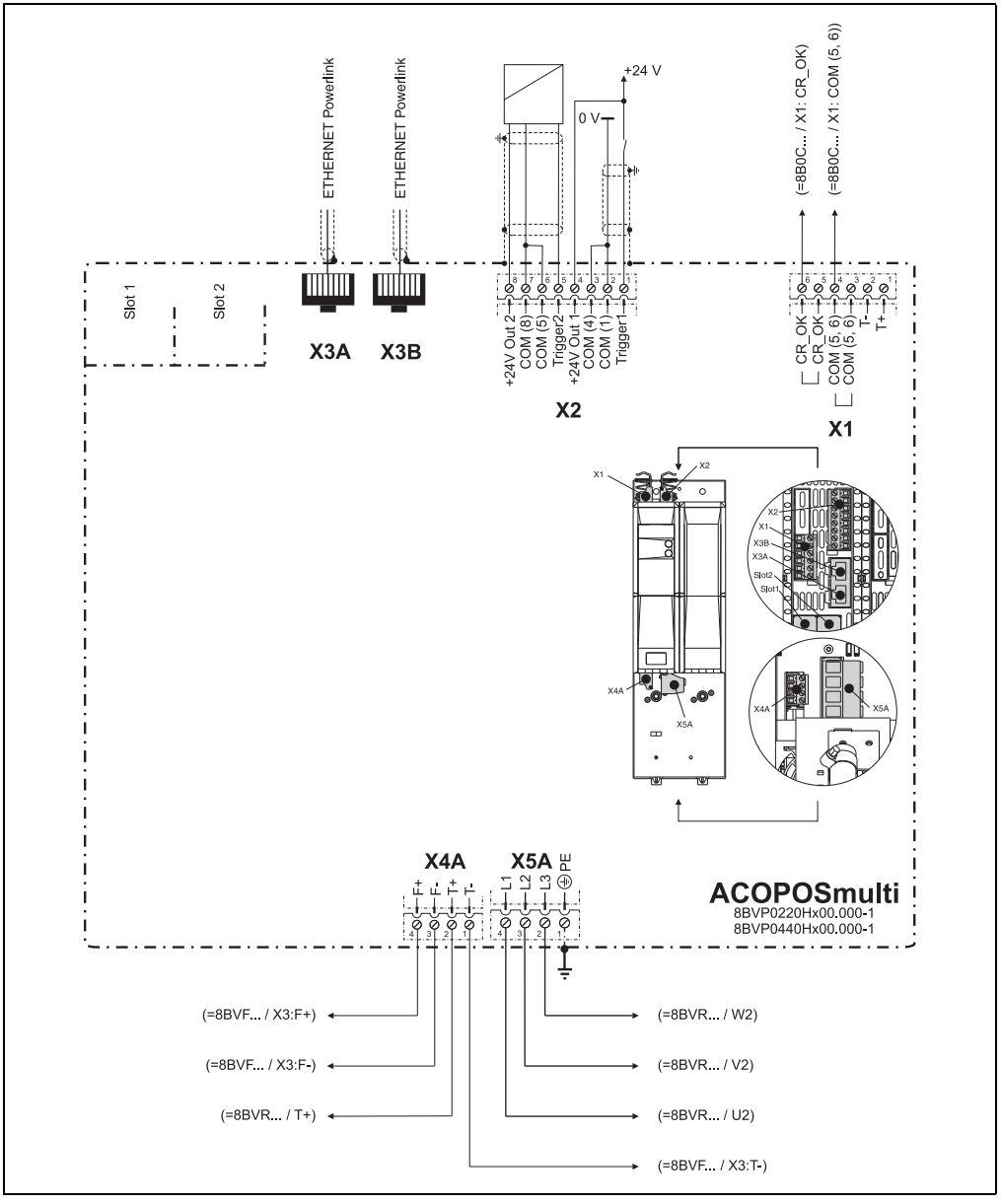



Figure 85: Overview of pin assignments - 8BVP0220Hx00.000-1, 8BVP0440Hx00.000-1

### 4.1.1 Pin assignments - X1 plug

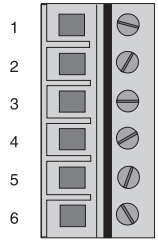
| X1 | Pin | Name | Function |
|---|---|---|---|
|  | 1 | T+ | Temperature sensor + |
| | 2 | T- | Temperature sensor - |
| | 3 | COM (5, 6) | DC bus ready 0 V |
| | 4 | COM (5, 6) | DC bus ready 0 V |
| | 5 | CR_OK | DC bus ready [1] |
| | 6 | CR_OK | DC bus ready [1] |



Table 111: Pin assignments for X1 plug - 8BVP0220Hx00.000-1, 8BVP0440Hx00.000-1

1) The CR_OK output is only set if the following condition is met:
The loading relay is closed and the DC bus voltage $U_{DC}$ > 270 VDC.

### 4.1.2 Pin assignments - X2 plug

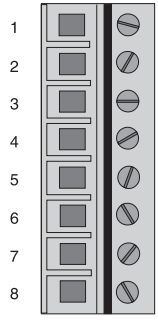
| X2 | Pin | Name | Function |
|---|---|---|---|
|  | 1 | Trigger1 | Trigger 1 |
| | 2 | COM (1) | Trigger 1 0 V |
| | 3 | COM (4) | +24 V output 1 0 V |
| | 4 | +24V Out 1 | +24 V output 1 |
| | 5 | Trigger2 | Trigger 2 |
| | 6 | COM (5) | Trigger 2 0 V |
| | 7 | COM (8) | +24 V output 2 0 V |
| | 8 | +24V Out 2 | +24 V output 2 |



Table 112: Pin assignments for X2 plug - 8BVP0220Hx00.000-1, 8BVP0440Hx00.000-1

### 4.1.3 Pin assignments - X3A, X3B plugs

| 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 113: Pin assignments for X3A, X3B plugs - 8BVP0220Hx00.000-1, 8BVP0440Hx00.000-1

#### Usage guidelines for B&R Powerlink cables

Special usage guidelines

Special usage guidelines must be adhered to for the following B&R Powerlink cables:

| Model number | Short description |
|---|---|
| X20CA0E61.0002 | Ethernet POWERLINK connection cables, RJ45 to RJ45, 0.2 m |
| X20CA0E61.0005 | Ethernet POWERLINK connection cables, RJ45 to RJ45, 0.5 m |
| X20CA0E61.0010 | Ethernet POWERLINK connection cables, RJ45 to RJ45, 1.0 m |
| X20CA0E61.0020 | Ethernet POWERLINK connection cables, RJ45 to RJ45, 2.0 m |
| X20CA0E61.0030 | Ethernet POWERLINK connection cables, RJ45 to RJ45, 3.0 m |
| X20CA0E61.0040 | Ethernet POWERLINK connection cables, RJ45 to RJ45, 4.0 m |
| X20CA0E61.0050 | Ethernet POWERLINK connection cables, RJ45 to RJ45, 5.0 m |
| X20CA0E61.0080 | Ethernet POWERLINK connection cables, RJ45 to RJ45, 8.0 m |
| X20CA0E61.0100 | Ethernet POWERLINK connection cables, RJ45 to RJ45, 10.0 m |
| X20CA0E61.0150 | Ethernet POWERLINK connection cables, RJ45 to RJ45, 15.0 m |
| X20CA0E61.0300 | Ethernet POWERLINK connection cables, RJ45 to RJ45, 30.0 m |
| X20CA0E61.0500 | Ethernet POWERLINK connection cables, RJ45 to RJ45, 50.0 m |
| X20CA3E61.0100 | Ethernet POWERLINK connection cables, RJ45 to RJ45, can be used in cable drag chains, 10.0 m |
| X20CA3E61.0150 | Ethernet POWERLINK connection cables, RJ45 to RJ45, can be used in cable drag chains, 15.0 m |
| X67CA0E41.0010 | Ethernet POWERLINK attachment cables, RJ45 to M12, 1.0 m |
| X67CA0E41.0050 | Ethernet POWERLINK attachment cables, RJ45 to M12, 5.0 m |
| X67CA0E41.0150 | Ethernet POWERLINK attachment cables, RJ45 to M12, 15.0 m |
| X67CA0E41.0500 | Ethernet POWERLINK attachment cables, RJ45 to M12, 50.0 m |
| X67CA3E41.0150 | Ethernet POWERLINK attachment cables, RJ45 to M12, can be used in cable drag chains, 15.0 m |

Table 114: Overview of B&R Powerlink cables

The unlocking mechanism for this B&R Powerlink cable is protected by a soft plastic clip (see figure 86 "B&R Powerlink cable").

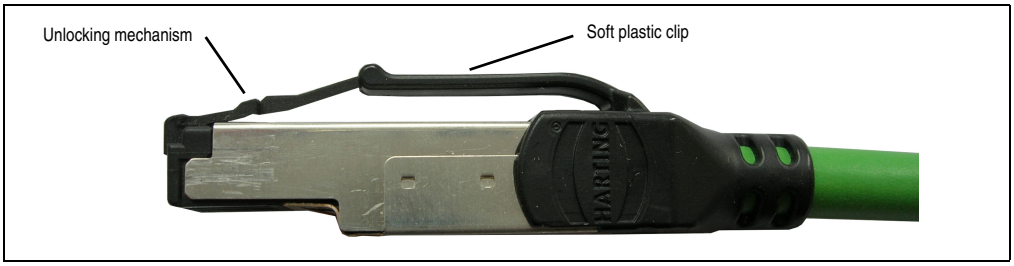



Figure 86: B&R Powerlink cable

This soft plastic clip connects the unlocking mechanism to the connector housing when extended and is designed to prevent the unlocking mechanism from breaking off when disconnecting the cable.

Disconnecting the B&R Powerlink cable from ACOPOSmulti modules

The RJ45 plug must be unlocked by pressing on the front part of the soft plastic clip and the B&R Powerlink cable must then be disconnected from the ACOPOSmulti module (see figure 87 "Correct unlocking of B&R Powerlink cables") .

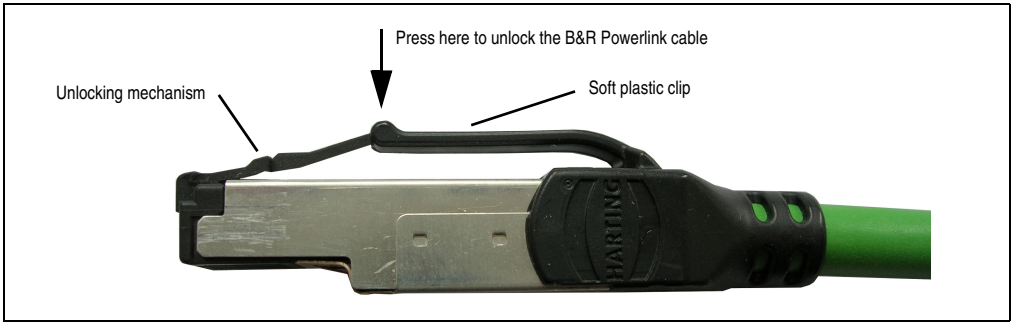



Figure 87: Correct unlocking of B&R Powerlink cables

## Caution!

**Before disconnecting the B&R Powerlink cable from ACOPOSmulti modules, make sure that the RJ45 plug is completely unlocked.**

### 4.1.4 Pin assignments - X4A plug

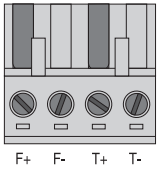
| X4A | Name | Function |
|---|---|---|
|  | T- | Network: Temperature sensor - |
| | T+ | Network: Temperature sensor + |
| | F- | Network: Fans - |
| | F+ | Network: Fans + |
| | | |

Table 115: Pin assignments for X4A plug - 8BVP0220Hx00.000-1, 8BVP0440Hx00.000-1

### 4.1.5 Pin assignments - X5A plug

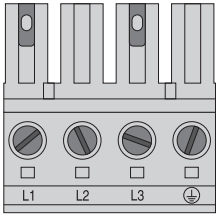
| X5A | Name | Function |
|---|---|---|
|  | PU | Network: Protective ground conductor |
| | L3 | Network: Power mains connection L3 |
| | L2 | Network: Power mains connection L2 |
| | L1 | Network: Power mains connection L1 |
| | | |

Table 116: Pin assignments for X5A plug - 8BVP0220Hx00.000-1, 8BVP0440Hx00.000-1

## Danger!

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

### 4.1.6 Input/output circuit diagram

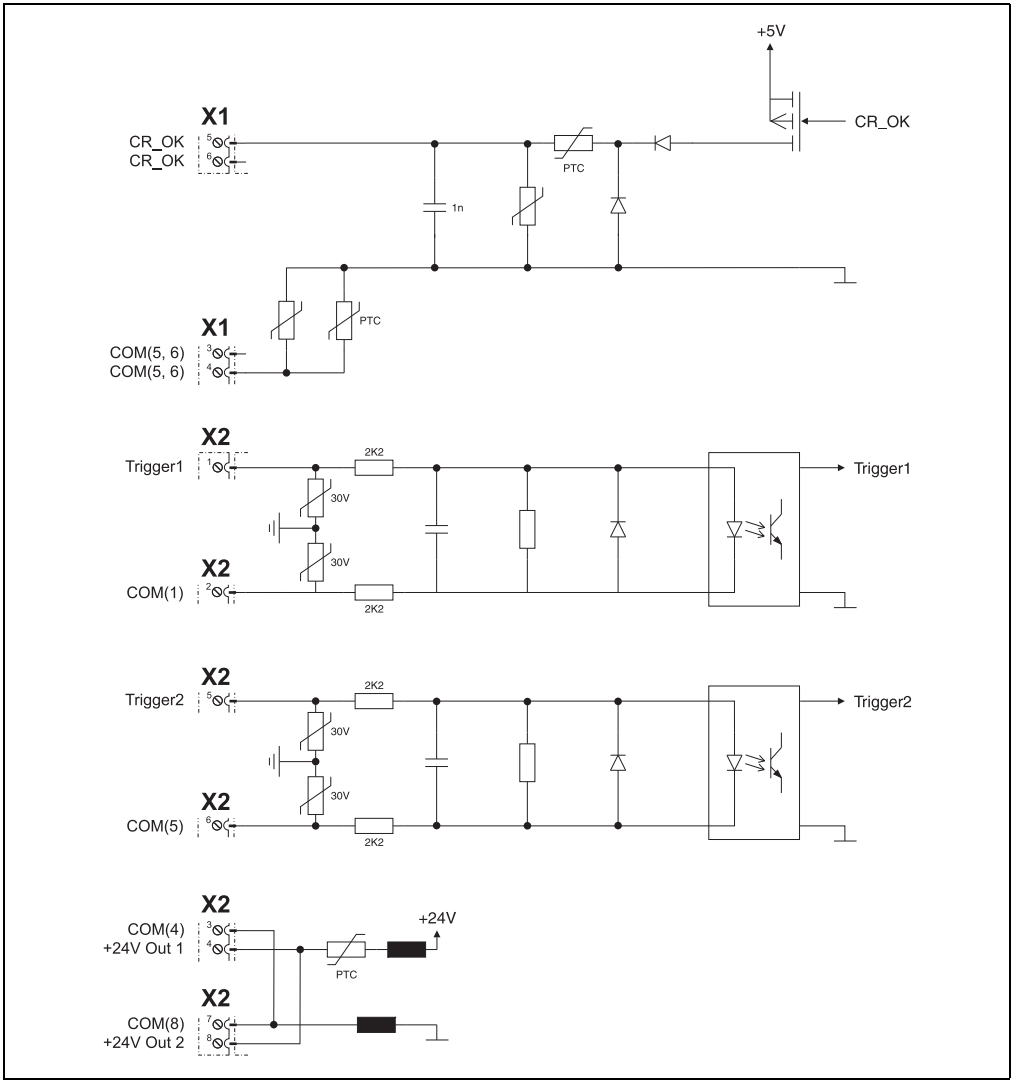



Figure 88: Input/output diagram - 8BVP0220Hx00.000-1, 8BVP0440Hx00.000-1

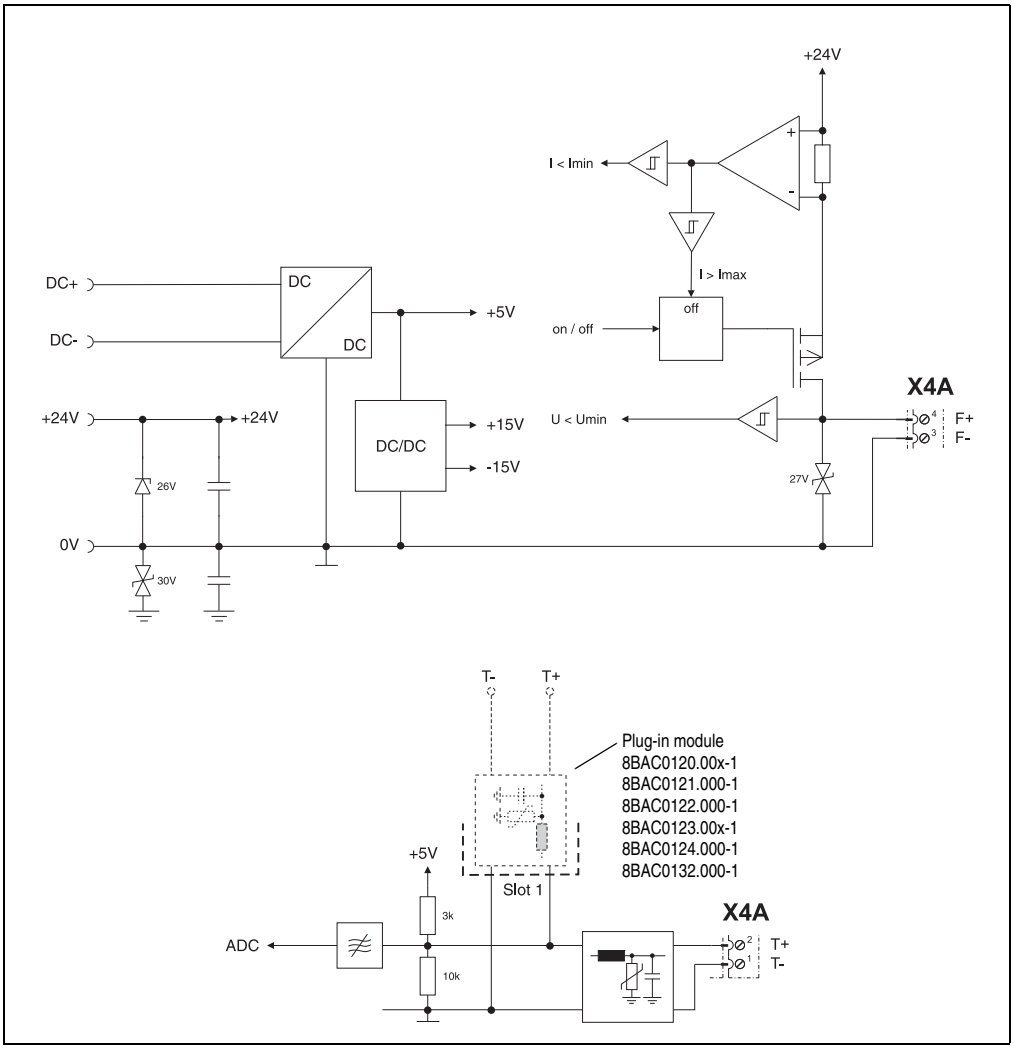



Figure 88: Input/output diagram - 8BVP0220Hx00.000-1, 8BVP0440Hx00.000-1 (Forts.)

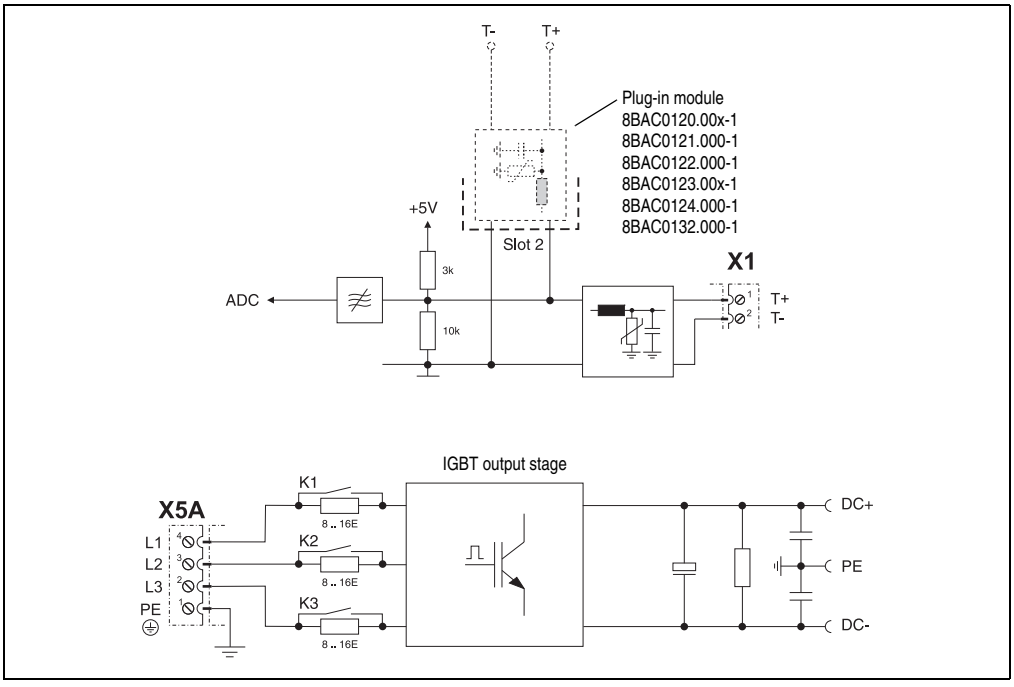



Figure 88: Input/output diagram - 8BVP0220Hx00.000-1, 8BVP0440Hx00.000-1 (Forts.)