

11. 8BVI inverter modules 16kW ... 32kW

11.1 Order data


| Model number | Short description | Figure |
|--------------------|--|--|
| | Wall mounting |  <p>8BVI0440HCS0.000-1</p> |
| 8BVI0220HWS0.000-1 | ACOPOSMulti inverter module 22A, HV, wall-mounting | |
| 8BVI0440HWS0.000-1 | ACOPOSMulti inverter module 44A, HV, wall-mounting | |
| | Cold plate or feed-through mounting | |
| 8BVI0220HCS0.000-1 | ACOPOSMulti inverter module 22A, HV, cold plate or feed-through mounting | |
| 8BVI0440HCS0.000-1 | ACOPOSMulti inverter module 44A, HV, cold plate or feed-through mounting | |

Table 40: Order data - 8BVI inverter modules, 16kW ... 32kW

| Required accessories | | | | |
|-------------------------------|--------|---|-------------------------|------|
| Model number | Amount | Short description | Comment | Page |
| 8TB2106.2010-00 | 1 | Screw terminal 6 pins, 1 row RM5.08 Label 1: numbered serially | Plug for X1 connection | --- |
| 8TB2108.2010-00 | 1 | Screw terminal 8 pins, 1 row RM5.08 Label 1: numbered serially | Plug for X2 connection | --- |
| 8TB2104.203L-00 | 1 | Screw terminal 4 pins, 1 row RM5.08 Label 3: T- T+ B- B+ Coding L: 1010 | Plug for X4A connection | --- |
| 8TB4104.204G-00 ¹⁾ | 1 | Screw terminal 4 pins, 1 row RM10.16 Label 4: PE W V U Coding G: 0110 | Plug for X5A connection | --- |
| 8TB4104.204G-10 ²⁾ | 1 | Screw terminal 4 pins, 1 row RM10.16 Label 4: PE W V U Coding G: 0110 | Plug for X5A connection | --- |

Table 41: Required accessory for 8BVI inverter modules, 16kW ... 32kW

1) Only for 8BVI0220HxS0.000-1.

2) Only for 8BVI0440HxS0.000-1.

| 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 |
| 8SCS000.0000-00 ¹⁾ | 1 | Shield component set consisting of: 1 shield plate 1x type 0 1 hose clamp, W 9mm, D 12-22mm | Shield component set for motor cables with a cable diameter of 12 - 22 mm | --- |
| 8SCS005.0000-00 | Up to 2 | Shield component set consisting of: 1 slot cover shield sheet | Shield sheet for covering free plug-in module slots | --- |
| 8SCS002.0000-00 | 1 | Shield component set consisting of: 1 clamping plate 2 clamps D 4-13.5mm 2 screws | Shield component set for I/O cable with a cable diameter of 4 - 13.5 mm | --- |
| 8SCS007.0000-00 ²⁾ | 1 | Shield component set consisting of: 1 shield mounting plate, 2x, 45° 4 screws | Base plate for mounting shield component set 8SCS008.0000-00 | --- |
| 8SCS008.0000-00 ²⁾ | 1 | Shield component set consisting of: 1 shield plate, 2x, type 0 1 hose clamp, W 9mm, D 23-35mm | Shield component set for motor cables with a cable diameter of 23 - 35 mm | --- |
| 8BXF001.0000-00 | --- | ACOPOSmulti fan module Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K) | Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K) | --- |

Table 42: Optional accessory for 8BVI inverter modules, 16kW ... 32kW

1) Only for 8BVI0220HxS0.000-1.

2) Only for 8BVI0440HxS0.000-1.

11.2 Technical data

| Product ID | 8BVI0220HWS0.000-1 8BVI0220HCS0.000-1 | 8BVI0440HWS0.000-1 8BVI0440HCS0.000-1 |
|--|--|--|
| Wall mounting Cold plate or feed-through mounting | | |
| General information | | |
| C-UL-US listed | Yes | |
| Available cooling and mounting methods | | |
| Wall mounting | Yes | |
| Cold plate or feed-through mounting | Yes | |
| Module width | 2 | |

Table 43: Technical data for inverter modules 16kW ... 32kW

Technical data • 8BVI inverter modules 16kW ... 32kW

| Product ID | | |
|---|---|--|
| Wall mounting Cold plate or feed-through mounting | 8BVI0220HWS0.000-1 8BVI0220HCS0.000-1 | 8BVI0440HWS0.000-1 8BVI0440HCS0.000-1 |
| DC bus | | |
| Voltage Max. | 800 VDC 900 VDC | |
| Continuous power consumption | In preparation | |
| Power loss at max. device power | In preparation | |
| DC bus capacitance | 495 µF | 990 µF |
| Design | ACOPOSMulti backplane | |
| 24 VDC supply | | |
| Input voltage | 25 VDC ±1.6% | |
| Input capacitance | 32.9 µF | |
| Max. power consumption | 20 W + P _{24 V Out} (0 ... 10 W) ¹⁾ + P _{HoldingBrake} + 2 * P _{Fan8B0M...} ²⁾ | |
| Design | ACOPOSMulti backplane | |
| Motor connector | | |
| Continuous power ³⁾ | 16 kW | 32 kW |
| Continuous current ³⁾ | 22 A _{eff} | 44 A _{eff} |
| Reduction of continuous current depending on switching frequency and cooling method ⁴⁾ | | |
| Switching frequency 20 kHz Wall mounting ⁵⁾ Installing the cold plate ⁶⁾ Feed-through mounting | 0.31 A/K (from -16°C) ⁷⁾ 0.36 A/K (from 5°C) ⁸⁾ In preparation | 0.36 A/K (from -77°C) ⁷⁾ 0.32 A/K (from -82°C) ⁸⁾ In preparation |
| Switching frequency 10 kHz Wall mounting ⁵⁾ Installing the cold plate ⁶⁾ Feed-through mounting | 0.4 A/K (from 31°C) 0.5 A/K (from 49°C) In preparation | 0.5 A/K (from -10°C) ⁷⁾ 0.62 A/K (from 6°C) ⁸⁾ In preparation |
| Switching frequency 5 kHz Wall mounting ⁵⁾ Installing the cold plate ⁶⁾ Feed-through mounting | No reduction No reduction In preparation | 1.57 A/K (from 40°C) 0.8 A/K (from 45°C) In preparation |
| Reduction of continuous power depending on altitude Starting at 500 m above sea level | 2.2 A _{eff} per 1000 m | 4.4 A _{eff} per 1000 m |
| Peak current | 55 A _{eff} | 88 A _{eff} |
| Rated switching frequency | 5 kHz | |
| Possible switching frequencies ⁹⁾ | 5/10/20 kHz | |
| Max. rate of rise in voltage according to IEC EN 60034-17 ¹⁰⁾ | 10 kV/µs | |
| Protective measures | | |
| Overload protection | Yes | |
| Short circuit and ground fault | Yes | |
| Maximum motor line length depending on the switching frequency ¹¹⁾ | | |
| Switching frequency 5 kHz | 25 m | |
| Switching frequency 10 kHz | 25 m | |
| Switching frequency 20 kHz | 25 m | |

Table 43: Technical data for inverter modules 16kW ... 32kW (Forts.)

Technical data • 8BVI inverter modules 16kW ... 32kW

| Product ID | 8BVI0220HWS0.000-1 8BVI0220HCS0.000-1 | 8BVI0440HWS0.000-1 8BVI0440HCS0.000-1 |
|--|--|--|
| Design U, V, W, PE Shield connection | Connectors Yes | |
| Terminal connection cross sections Flexible and fine wire lines with wire tip sleeves Approbation data UL/C-UL-US CSA | 0.5 - 6 mm ² 20 - 8 20 - 8 | 0.5 - 16 mm ² 20 - 6 20 - 6 |
| Terminal cable outer-cross-section dimension of the shield connection | 12 - 22 mm | 23 - 35 mm |
| Motor holding brake connection | | |
| Output voltage | 24 VDC +5.8% / -0.1% | |
| Continuous current | 4.2 A | |
| Max. internal resistance | 0.15 Ω | |
| Extinction potential | Approx. 30 V | |
| Max. extinction energy per connection | 3 Ws | |
| Max. switching frequency | 0.5 Hz | |
| Protective measures Overload and short-circuit protection Cable breakage monitoring Undervoltage monitoring | Yes Yes Yes | |
| Max. over-current limitation | 10 A | |
| Response threshold for cable breakage monitoring | Approx. 0.5 A | |
| Response threshold for undervoltage monitoring | 24 VDC +0% / -5% | |
| Trigger inputs | | |
| Number of inputs | 2 | |
| Wiring | Sink | |
| Electrical isolation Input - inverter module Input - Input | Yes No | |
| Input voltage Rated Maximum | 24 VDC 30 VDC | |
| Switching threshold LOW HIGH | <5 V >15 V | |
| Input current at rated voltage | Approx. 10 mA | |
| Switching delay Positive edge Negative edge | 52 μs ± 0.5 μs (digitally filtered) 53 μs ± 0.5 μs (digitally filtered) | |
| Modulation compared to ground potential | Max. ±38 V | |

Table 43: Technical data for inverter modules 16kW ... 32kW (Forts.)

Technical data • 8BVI inverter modules 16kW ... 32kW

| Product ID | 8BVI0220HWS0.000-1 8BVI0220HCS0.000-1 | 8BVI0440HWS0.000-1 8BVI0440HCS0.000-1 |
|---|---|--|
| Wall mounting Cold plate or feed-through mounting | | |
| 24 V Out | | |
| Amount | 2 | |
| Output voltage DC bus voltage 260 ... 315 VDC DC bus voltage 315 ... 900 VDC | 25 VDC * (DC bus voltage / 315) 24 VDC ±6% | |
| Fuse protection | 500 mA (slow-blow) electronic, automatic reset | |
| Enable inputs | | |
| Number of inputs | 2 | |
| Wiring | Sink | |
| Electrical isolation Input - inverter module | Yes | |
| Input voltage Rated Maximum | 24 VDC 30 VDC | |
| Switching threshold LOW HIGH | <5 V >15 V | |
| Input current at rated voltage | Approx. 30 mA | |
| Switching delay @ 24 VDC Enable 1 -> 0, PWM off Enable 0 -> 1, Ready for PWM | Max. 20,5 ms Max. 100 µs | |
| Modulation compared to ground potential | Max. ±38 V | |
| Operational conditions | | |
| Ambient temperature during operation Max. ambient temperature ¹²⁾ | 5 to 40°C +55°C | |
| Relative humidity during operation | 5 to 85%, non-condensing | |
| Installation at altitudes above sea level Maximum installation altitude ¹³⁾ | 0 to 500 m 4000 m | |
| Degree of pollution according to EN 60664-1 | 2 (non-conductive material) | |
| Overvoltage cat. according to 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 43: Technical data for inverter modules 16kW ... 32kW (Forts.)

| Product ID | 8BVI0220HWS0.000-1 8BVI0220HCS0.000-1 | 8BVI0440HWS0.000-1 8BVI0440HCS0.000-1 |
|--|--|--|
| Wall mounting Cold plate or feed-through mounting | | |
| Mechanical characteristics | | |
| Dimensions ¹⁴⁾ | | |
| Width | | 106.5 mm |
| Height | | 317 mm |
| Depth | | |
| Wall mounting | | 263 mm |
| Cold-plate | | 212 mm |
| Feed-through mounting | | 209 mm |
| Weight | | |
| Wall mounting | | Approx. 5.2 kg |
| Cold-plate | | Approx. 4.2 kg |
| Feed-through mounting | | Approx. 4.2 kg |

Table 43: Technical data for inverter modules 16kW ... 32kW (Forts.)

- 1) The power consumption $P_{24\text{ V Out}}$ 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).
- 2) The power consumption P_{Fan8BOM} corresponds to the portion of the power that is used by the fan modules in the mounting plate / by the 8BOM0040HFF0.000-1 fan module and can be found in the technical data for the respective 8BOM... mounting plate.
- 3) The continuous power and continuous current are valid for the following boundary conditions: Nominal DC bus voltage 800 VDC, nominal switching frequency 5 kHz, 40°C ambient temperature, installation altitudes < 500 m above sea level.
- 4) 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.
- 5) The temperature specifications are based on the ambient temperature.
- 6) The temperature specifications are based on the return temperature of the cold plate mounting plate.
- 7) 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.
- 8) 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", auf Seite 203 must be taken into consideration!

- 9) 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 current and increases the CPU load. When using double-axis modules, the increased CPU load causes a reduction of the functional range in the drive; if this is not taken into consideration then it can cause the computing time to be exceeded in extreme cases.
- 10) The value listed is only valid for motor cables with a length > 3 m and also depends (to a small extend) on the motor used.

11) Information:

When using two motor cables that are connected in parallel, the maximum permissible motor cable lengths are reduced by half.

The total length of all motor cables per backplane module is limited (see section 3 "Line filter 8BVF" on page 41).

- 12) Continuous operation of ACOPOSmulti inverter 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.
- 13) Continuous operation of ACOPOSmulti inverter 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.
- 14) 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).

2.4.7 Inverter modules 8BVI0220HWS0.000-1, 8BVI0440HWS0.000-1

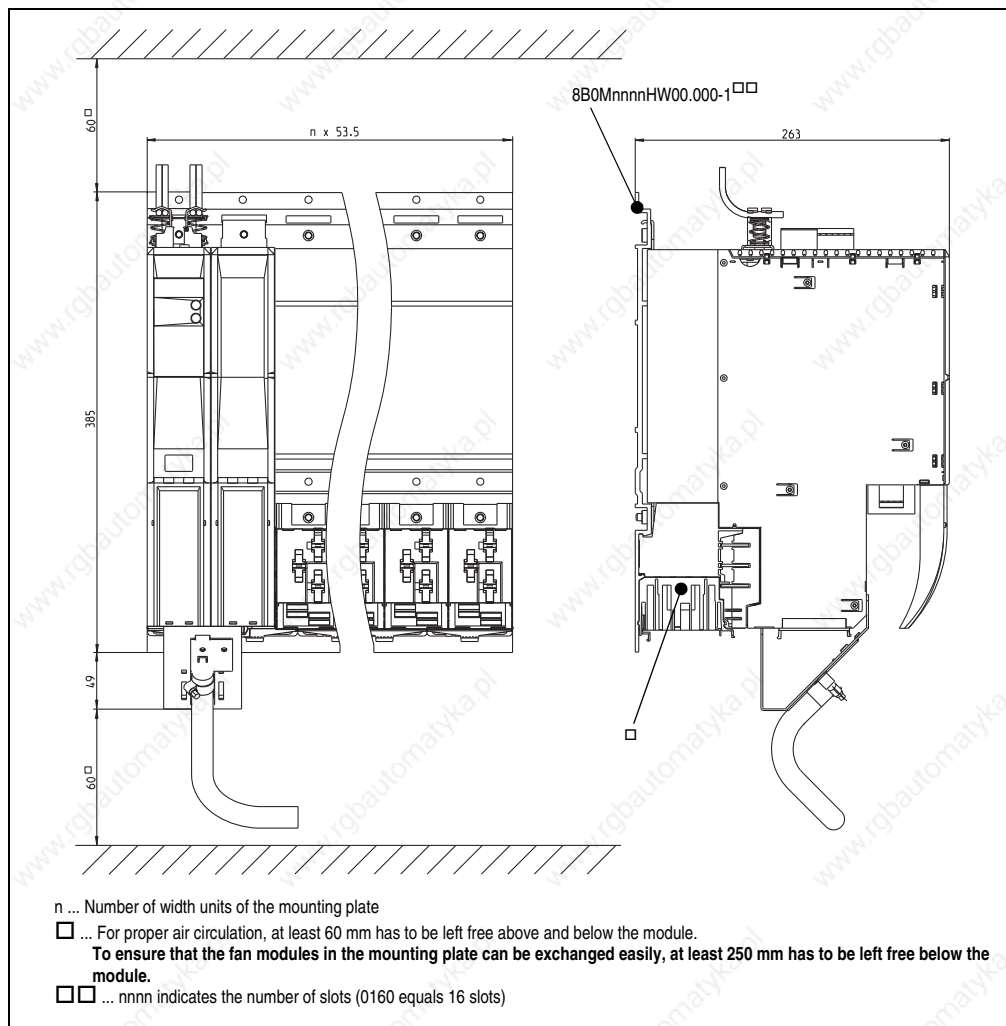


Figure 29: Dimensional diagram and installation dimensions for 8BVI0220HCW0.000-1, 8BVI0440HWS0.000-1

6.3 8BVI0220HxS0.000-1, 8BVI0440HxS0.000-1

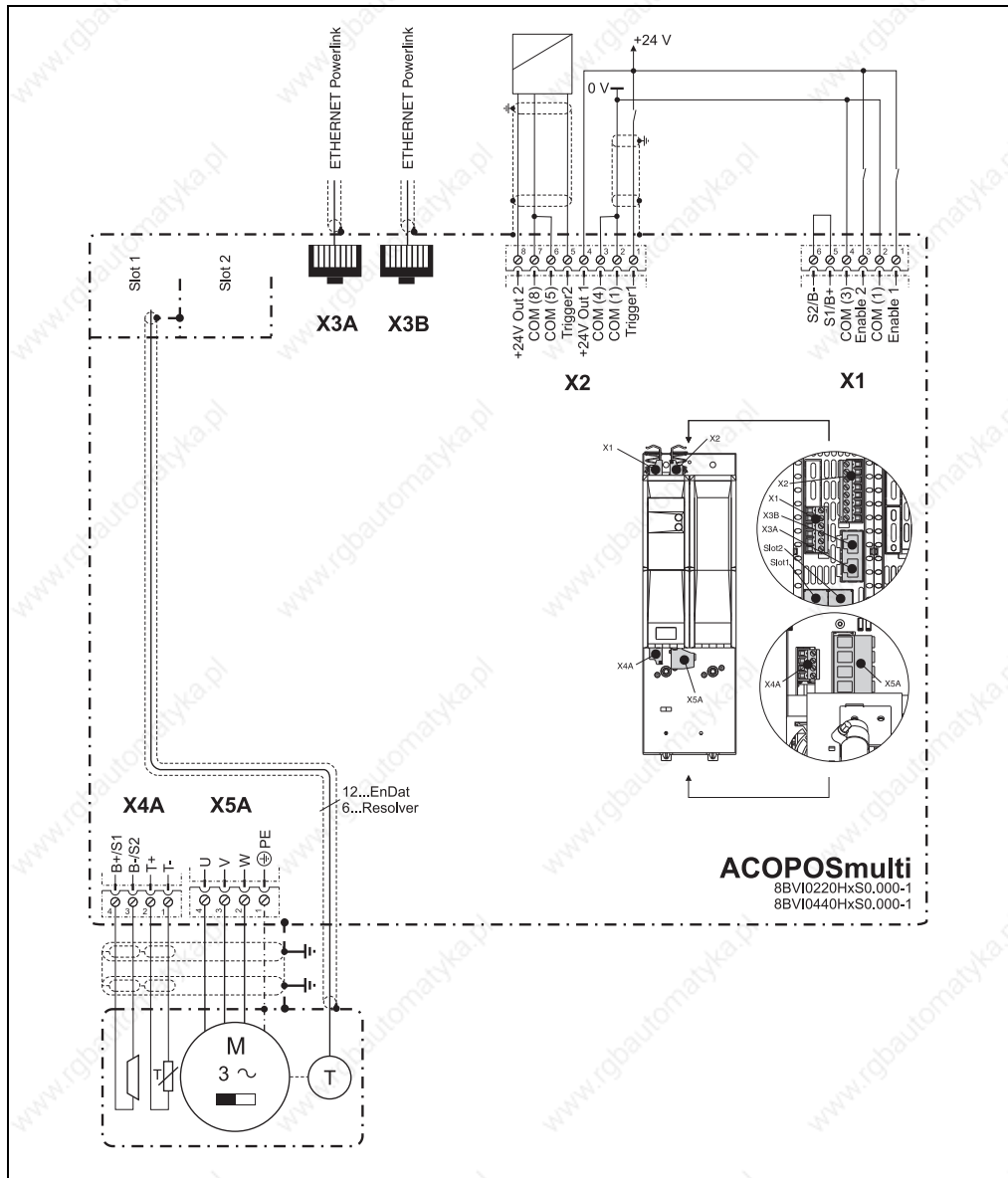


Figure 110: Overview of pin assignments - 8BVI0220HxS0.000-1, 8BVI0440HxS0.000-1

6.3.1 Pin assignments - X1 plug

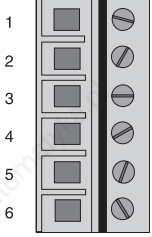
| X1 | | Pin | Name | Function |
|---|---|-----|---------------------|---|
|  | 1 | 1 | Enable 1 | Axis 1: Enable 1 |
| | 2 | 2 | COM (1) | Axis 1: Enable 1 0 V |
| | 3 | 3 | Enable 2 | Axis 1: Enable 2 |
| | 4 | 4 | COM (3) | Axis 1: Enable 2 0 V |
| | 5 | 5 | S1/B+ ¹⁾ | Axis 1: Brake + / Activation for the external holding brake |
| | 6 | 6 | S2/B- ¹⁾ | Axis 1: Brake - / Activation for the external holding brake |

Table 144: Pin assignments for X1 plug - 8BVI0220HxS0.000-1, 8BVI0440HxS0.000-1

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

6.3.2 Pin assignments - X2 plug

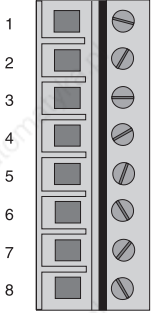
| X2 | | Pin | Name | Function |
|--|---|-----|-------------|--------------------|
|  | 1 | 1 | Trigger1 | Trigger 1 |
| | 2 | 2 | COM (1) | Trigger 1 0 V |
| | 3 | 3 | COM (4) | +24 V output 1 0 V |
| | 4 | 4 | +24 V Out 1 | +24 V output 1 |
| | 5 | 5 | Trigger2 | Trigger 2 |
| | 6 | 6 | COM (5) | Trigger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

Table 145: Pin assignments for X2 plug - 8BVI0220HxS0.000-1, 8BVI0440HxS0.000-1

6.3.3 Pin assignments - X3A, X3B plugs

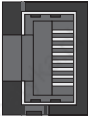
| X3A, X3B | Pin | Name | Function |
|---|-----|--------|--------------------------|
|  | 1 | RXD | Receive signal |
| | 2 | RXD\ | Receive signal inverted |
| | 3 | TXD | Transmit signal |
| | 4 | Shield | Shield |
| | 5 | Shield | Shield |
| | 6 | TXD\ | Transmit signal inverted |
| | 7 | Shield |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

Table 146: Pin assignments for X3A, X3B plugs - 8BVI0220HxS0.000-1, 8BVI0440HxS0.000-1

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 147: Overview of B&R Powerlink cables

The unlocking mechanism for this B&R Powerlink cable is protected by a soft plastic clip (see figure 111 "B&R Powerlink cable").

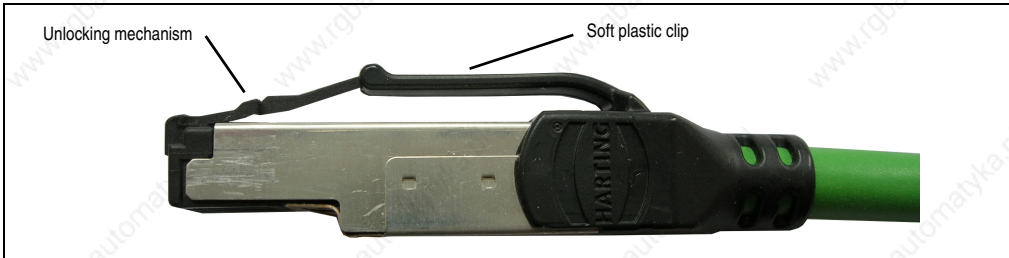


Figure 111: B&R Powerlink cable

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 112 "Correct unlocking of B&R Powerlink cables") .

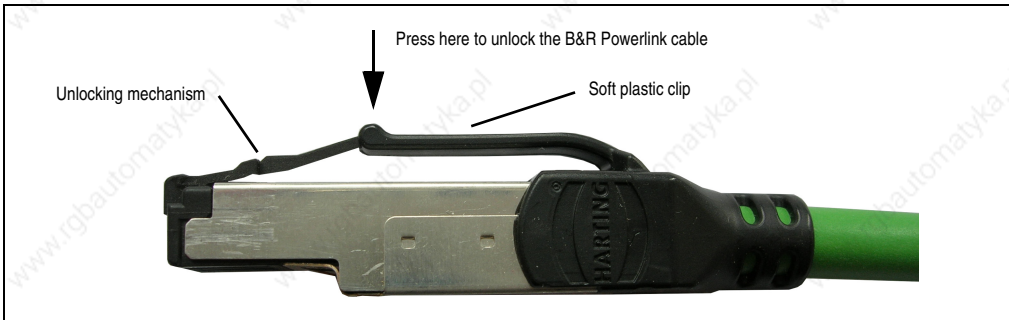


Figure 112: Correct unlocking of B&R Powerlink cables

Caution!

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

6.3.4 Pin assignments - X4A plug

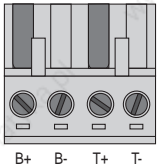
| X4A | Name | Function |
|---|---------------------|---|
|  | T- | Axis 1: Temperature sensor - |
| | T+ | Axis 1: Temperature sensor + |
| | B-/S2 ¹⁾ | Axis 1: Brake - / Activation for the external holding brake |
| | B+/S1 ¹⁾ | Axis 1: Brake + / Activation for the external holding brake |
| | | |

Table 148: Pin assignments for X4A plug - 8BVI0220HxS0.000-1, 8BVI0440HxS0.000-1

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

6.3.5 Pin assignments - X5A plug

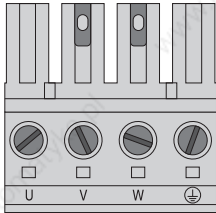
| X5A | Name | Function |
|---|------|-------------------------------------|
|  | PU | Axis 1: Protective ground conductor |
| | W | Axis 1: Motor connection W |
| | V | Axis 1: Motor connection V |
| | U | Axis 1: Motor connection U |
| | | |

Table 149: Pin assignments for X5A plug - 8BVI0220HxS0.000-1, 8BVI0440HxS0.000-1

6.3.6 Input/output circuit diagram

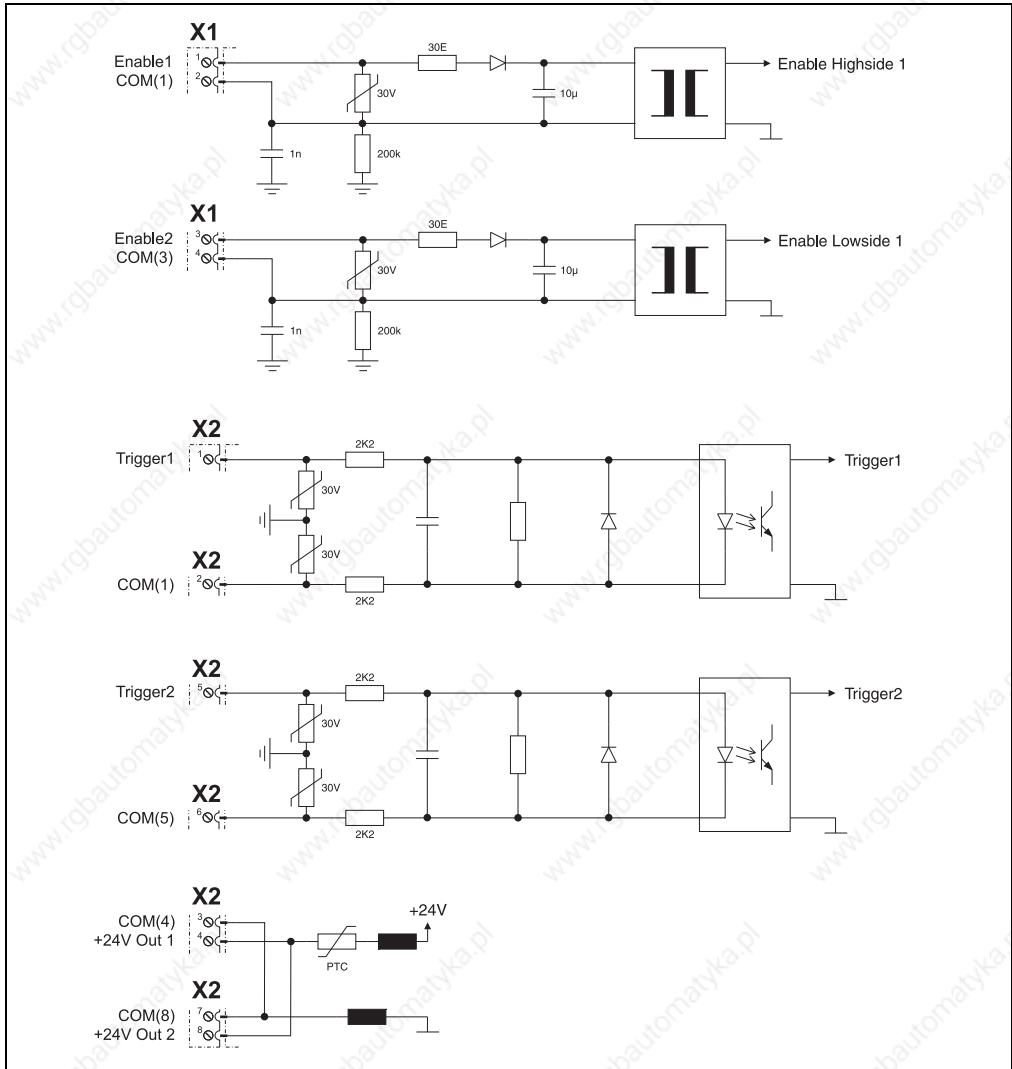


Figure 113: Input/output circuit diagram

8BVI0014HxS0.000-1, 8BVI0028HxS0.000-1, 8BVI0055HxS0.000-1, 8BVI0110HxS0.000-1

Wiring • 8BVI inverter modules

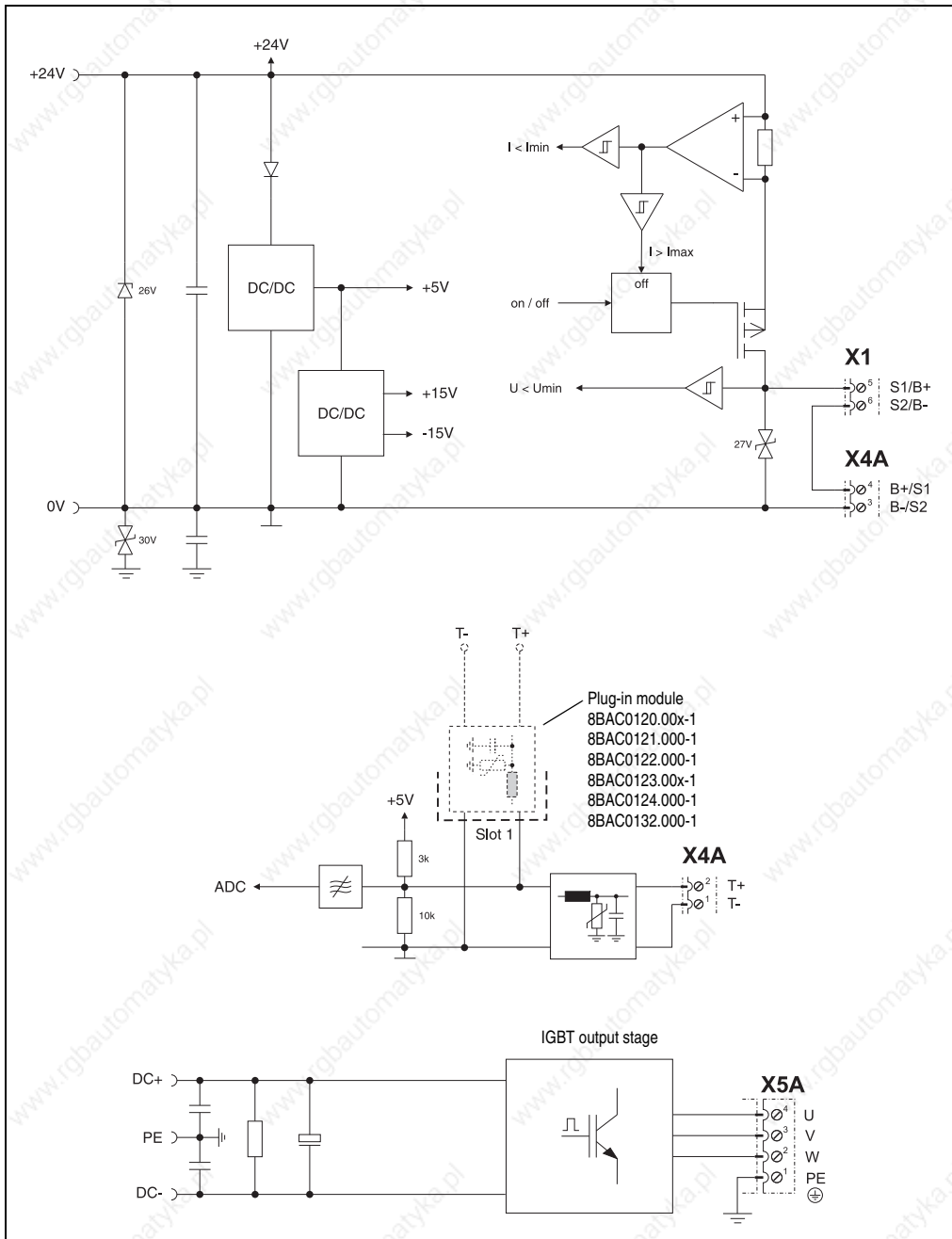


Figure 113: Input/output circuit diagram

8BVI0014HxS0.000-1, 8BVI0028HxS0.000-1, 8BVI0055HxS0.000-1, 8BVI0110HxS0.000-1 (Forts.)