rexroth
A Bosch Company

# IndraControl VPB 40.4

## Control Cabinet PC

**Operating Instructions**
**R911376309**

Edition 02

## Change Record

Edition 02, 2019-06

Refer to tab. 1-1 "Change Record" on page 1

## Copyright



## Liability



## Editorial Department

Development Automation Systems Control Platform HoBr (MaKo/MePe)

# Table of Contents

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# 1 About this documentation

## Editions of this documentation

| Edition | Release Date | Note |
|---|---|---|
| 01 | 2016-06 | First edition |
| 02 | 2019-06 | CDI+ interface supplemented |

**Tab. 1-1:** Change Record

## 1.1 Overview on target groups and product phases

In the following illustration, the framed activities, product phases and target groups refer to the present documentation.

Example: In the product phase "Mounting (assembly/installation)", the "mechanic/electrician" can execute the activity "install" using this documentation.

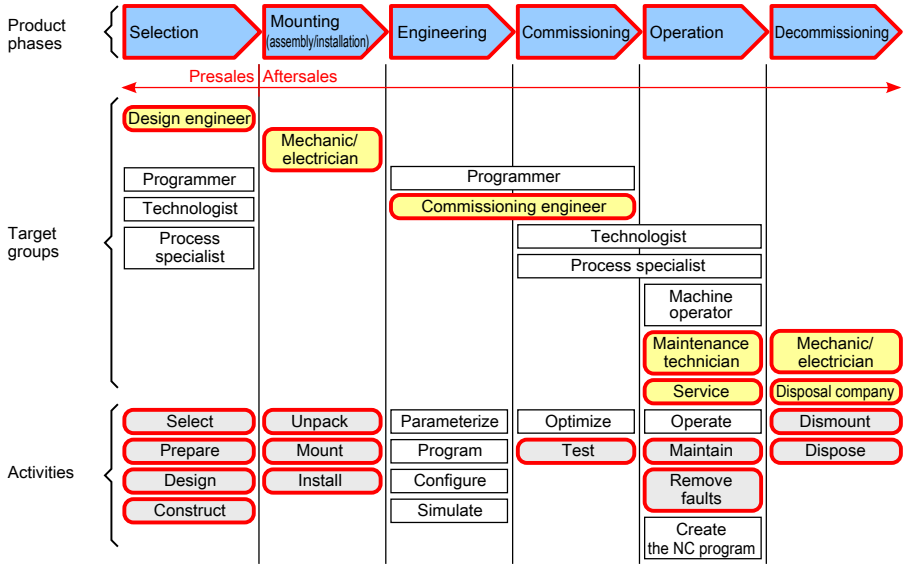



**Fig. 1-1:** Assigning the present documentation to the target groups, product phases and activities of the target group

## 1.2 Purpose

This document instructs the technical staff of the machine manufacturer on how to perform the mechanical and electrical installation safely and on how to commission the device.

Required qualification: Individual who is able to assess the tasks assigned and to identify possible safety risks owing to qualification in the subject, knowledge and experience. The individual should also be familiar with the standards and regulations.

## 1.3 Scope

This operating instructions applies to all variants whose type code starts with "VPBxx.4...".

The type code specifications are located on the type plate of the device. Also refer to chapter 2 "Product identification and scope of delivery" on page 2.

## 1.4 Related documents

| Title | Part number and document type |
|---|---|
| IndraControl VAU 01.1 | R911336867 |
| UPS with Communication Interface | Operating Instructions |
| IndraControl VAP 01 | R911339613 |
| Power Supply Unit | Operating Instructions |
| IndraControl VDP 16.3, VDP 40.3, VDP 60.3 | R911336378 |
| Operator Display | Operating Instructions |
| IndraControl V-Devices | R911343901 |
| Operating Systems | Project Planning Manual |

**Tab. 1-2:** Related documents

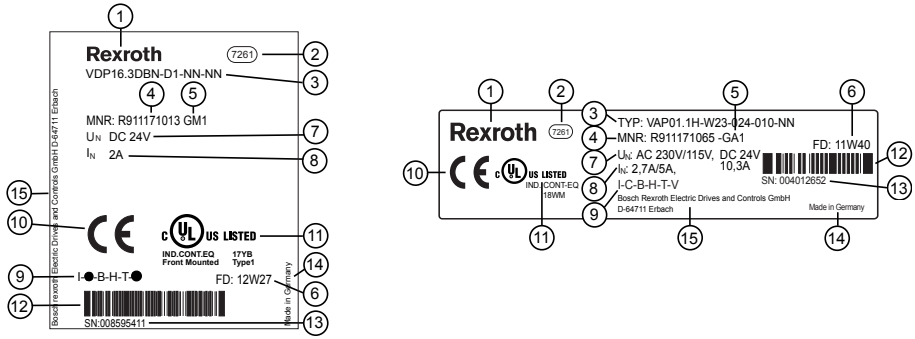
## 1.5 Customer feedback

Customer requests, comments or suggestions for improvement are of great importance to us. Please email your feedback on the documentations to Feedback.Documentation@boschrexroth.de. Directly insert comments in the electronic PDF document and send the PDF file to Bosch Rexroth.

# 2 Product identification and scope of delivery

## 2.1 Product identification

The type plate is located on the rear side or at the side of the device.




1 Word mark
2 Division or plant number
3 Type name (type code)
4 Part number
5 State of revision
6 Date of manufacture (yyWww)
7 Nominal voltage
8 Nominal current
9 Test marking
10 CE mark
11 Underwriters Laboratories Inc. mark
12 Serial number as barcode
13 Serial number
14 Name of origin
15 Company address

**Fig. 2-1:** Exemplary type plates

## 2.2 Scope of delivery

- Control cabinet PC IndraControl VPB 40.4
- Safety instructions
- 24 V female connector strip

# 3 Using safety instructions

## 3.1 Structure of the safety instructions

The safety instructions are structured as follows:

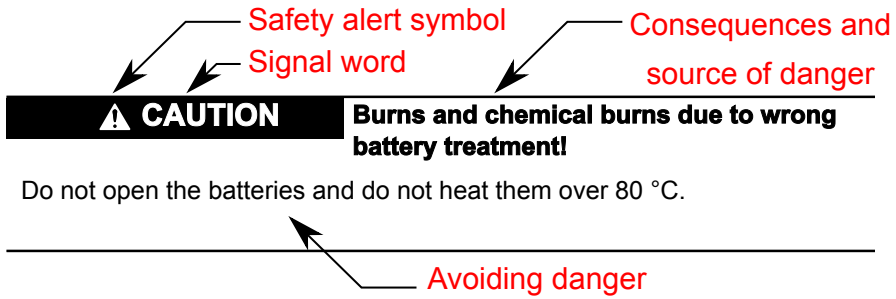



**Fig. 3-1:** Structure of the safety instructions

## 3.2 Explaining signal words and safety alert symbol

The safety instructions in this documentation contain specific signal words (danger, warning, caution, notice) and, if necessary, a safety alert symbol (according to ANSI Z535.6-2006).

The signal word draws attention to the safety instruction and indicates the risk potential.

The safety alert symbol (triangular safety reflector with exclamation marks), preceding the signal words Danger, Warning, Caution indicates hazards for persons.

**⚠ DANGER**

In case of non-compliance with this safety instruction, death or serious injury **will** occur.

**⚠ WARNING**

In case of non-compliance with this safety instruction, death or serious injury **can** occur.

**⚠ CAUTION**

In case of non-compliance with this safety instruction, minor or moderate injury can occur.

***NOTICE***

In case of non-compliance with this safety instruction, material damage can occur.

## 3.3 Symbols used

Pointers are displayed as follows:

 This is a note.

Tips are displayed as follows:

 This is a tip.

## 3.4 Explaining the signal alert symbol on the device

If this symbol is on your device, you have to observe the documentation on the device. The respective documentation informs on the type of hazard as well as the steps required to avoid this hazard.

# 4 Intended use

The control cabinet PC IndraControl VPB 40.4 provides - together with an operator display (e.g. IndraControl VDP xx.3) - a PC-based operator terminal that can also have a control functionality. This functionality depends on the application and on the configuration.

***NOTICE***

**Risk of damaging the device if not expressly stated accessories, mounting parts and other components, cables, lines and software and firmware are used**

The control cabinet PC IndraControl VPB 40.4 may only be used with the accessories and mounting parts listed in this documentation. Components that are not expressly mentioned must neither be attached nor connected. The same applies to cables and lines.

Only to be operated with the component configurations and combinations expressly defined and with the software and firmware specified in the corresponding functional description.

Typical areas of application of the control cabinet PC IndraControl VPB 40.4:

- Handling and assembly systems
- Food and packaging machines
- Printing and paper converting machines
- Machine tools
- Wood working machines

The control cabinet PC IndraControl VPB 40.4 may only be operated under the mounting and installation conditions, in the position of application and under the ambient conditions (temperature, degree of protection, humidity, EMC, etc.) specified in this documentation.

# 5 Spare parts, accessories and wear parts

## 5.1 Y-repeater

Connecting unit to connect two operator displays with the same resolution and the same version to one control cabinet PC.

| Ordering code | Part number | Description |
|---|---|---|
| VAC01.1S-YD1-NNNN | R911171187 | Y-repeater for CDI interface |

## 5.2 Splitter

Connecting unit to connect two operator displays with the same resolution and the same version to one control cabinet PC.

| Ordering code | Part number | Description |
|---|---|---|
| VAC08.1SSP-HDM-2D2-NNNN | R911175117 | Splitter for CDI+ interface |

## 5.3 External 24 V power supply unit

External 24 V power supply unit for IndraControl V-devices.

| Ordering code | Part number | Description |
|---|---|---|
| VAP01.1H-W23-024-010-NN | R911171065 | External 24 V power supply unit for IndraControl V-devices |

## 5.4 Uninterruptible power supply (UPS)

| Ordering code | Part number | Description |
|---|---|---|
| VAU01.1U-024-024-240-NN | R911171024 | Uninterruptible power supply<br>DC 24 V, 240 watts with USB interface |

## 5.5 Connecting cables for the CDI interface and the CDI+ interface

Connecting cables to connect the control cabinet PC to the operator display.

| Ordering code | Part number | Description |
|---|---|---|
| RKB0008/000,5 (*******-*******-*******) | R911171484 | Length 0.5 m |
| RKB0008/001,0 (*******-*******-*******) | R911171485 | Length 1 m |
| RKB0008/002,5 (*******-*******-*******) | R911170151 | Length 2.5 m |
| RKB0008/005,0 (*******-*******-*******) | R911170152 | Length 5 m |
| RKB0008/007,5 (*******-*******-*******) | R911172971 | Length 7.5 m |
| RKB0008/010,0 (*******-*******-*******) | R911170153 | Length 10 m |

| Ordering code | Part number | Description |
|---|---|---|
| RKB0008/015,0 (*******-*******-*******) | R911171183 | Length 15 m |
| RKB0008/020,0 (*******-*******-*******) | R911171184 | Length 20 m |
| RKB0008/025,0 (*******-*******-*******) | R911170154 | Length 25 m |
| RKB0008/030,0 (*******-*******-*******) | R911171381 | Length 30 m |
| RKB0008/035,0 (*******-*******-*******) | R911171369 | Length 35 m |
| RKB0008/040,0 (*******-*******-*******) | R911171382 | Length 40 m |
| RKB0008/050,0 (*******-*******-*******) | R911171383 | Length 50 m |
| RKB0008/055,0 (*******-*******-*******) | R911173779 | Length 55 m |
| RKB0008/060,0 (*******-*******-*******) | R911173780 | Length 60 m |
| RKB0008/065,0 (*******-*******-*******) | R911173781 | Length 65 m |
| RKB0008/070,0 (*******-*******-*******) | R911173781 | Length 70 m |

Further cable lengths are available upon request.

Two cables are always required for the CDI connection between the control cabinet PC and the operator display.

A cable is required for the CDI+ connection between the control cabinet PC and the operator display.

## 5.6 USB connecting cable (USB2.0)

| Ordering code | Part number | Description |
|---|---|---|
| RKB0019/000,5 (*******-*******-*******) | R911171165 | USB connecting cable, length 0.5 m |
| RKB0019/001,0 (*******-*******-*******) | R911171166 | USB connecting cable, length 1 m |
| RKB0019/003,0 (*******-*******-*******) | R911171167 | USB connecting cable, length 3 m |

## 5.7 USB connecting cable with increased noise immunity (USB2.0)

In noisy environments, use USB cables with increased noise immunity to connect the control cabinet PC to the uninterruptible power supply with communication interface.

| Ordering code | Part number | Description |
|---|---|---|
| RKB0023/001,0 (*******-*******-*******) | R911171627 | USB connecting cable with increased noise immunity, Length 1 m |
| RKB0023/003,0 (*******-*******-*******) | R911171414 | USB connecting cable with increased noise immunity, Length 3 m |

## 5.8 Wear parts

Wear parts are not subject to any warranty.

### 5.8.1 CMOS battery

The guaranteed service life of the CMOS battery is 5 to 7 years.

### 5.8.2 Mechanical hard disk

The hard disk is an electromechanical wear part that is subject to wear during the operating time. The service life depends on the operating hours, the number of accesses to the hard disk as well as on vibration and shocks.

### 5.8.3 Solid State Drive

The SSD (Solid State Drive) shock resistance and temperature resistance is higher than of an ordinary hard disk. The hard disk is only subject to electrical and not to mechanical wear.

***NOTICE*** **The SSD wears faster in case of defragmentation**

Defragmentation is not necessary, as an SSD is an electronic storage medium.

### 5.8.4 Fans

Fans are mechanical wear components. Their service life is extremely temperature-dependent. The service life of the fan integrated into the housing, is as follows:

| Ambient temperature | Service life |
|---|---|
| 40 °C | 60,000 hours |
| 70 °C | 30,000 hours |

# 6 Ambient conditions

| | In operation | Transport | Storage |
|---|---|---|---|
| Max. ambient temperature | +5 °C to +45 °C | -20 °C to +60 °C | -20 °C to +60 °C |
| Max. temperature gradient | Temporal temperature changes up to 3 K per minute | Temporal temperature changes up to 3 K per minute | Temporal temperature changes up to 3 K per minute |
| Humidity | Min. rel. humidity 5 %<br>Max. rel. humidity 85 %<br>Min. absolute humidity 1 g/m$^3$<br>Max. absolute humidity 25 g/m$^3$<br>Condensation not allowed<br>Corresponds to climatic class 3K3 acc. to EN 60721-3-3 | Min. rel. humidity 5 %<br>Max. rel. humidity 85 %<br>Min. absolute humidity 1 g/m$^3$<br>Max. absolute humidity 25 g/m$^3$<br>Condensation not allowed<br>Corresponds to climatic class 2K2 acc. to EN 60721-3-2 | Min. rel. humidity 5 %<br>Max. rel. humidity 85 %<br>Min. absolute humidity 1 g/m$^3$<br>Max. absolute humidity 25 g/m$^3$<br>Condensation not allowed<br>Corresponds to climatic class 1K2 acc. to EN 60721-3-1 |
| Air pressure | Up to 3,000 m above sea level acc. to EN 61131-2 | Up to 3,000 m above sea level acc. to EN 61131-2 | Up to 3,000 m above sea level acc. to EN 61131-2 |
| Mechanical strength | Max. vibration:<br>Frequency range: 10 Hz to 150 Hz<br>Excursion:<br>0.75 mm at 10 Hz to 57 Hz<br>Acceleration:<br>1 g at 57 Hz to 150 Hz<br>Acc. to EN 60068-2-6 | Max. shock:<br>15 g 11 ms<br>Acc. to EN 60068-2-27 | Max. shock:<br>15 g 11 ms<br>Acc. to EN 60068-2-27 |
| Contamination level acc. to EN 60664-1 | 2 | 2 | 2 |
| Overvoltage category acc. to EN 60664-1 | 2 | – | – |

**Tab. 6-1:** Ambient conditions

**NOTICE** **Defective product due to gases jeopardizing functions**

Due to the risk of corrosion, avoid sulphurous gases (e.g. sulphur dioxide ($SO_2$) and hydrogen suphide ($H_2S$)). The product is not resistant against these gases.

The device is not resistant to gas jeopardizing the function [sulphur dioxide ($SO_2$), hydrogen sulphide ($H_2S$)].

**NOTICE** **Failure of the product due to contaminated air**

- The ambient air must not contain acids, alkaline solutions, corrosive agents, salts, metal vapors and other electrically conductive contaminants in high concentrations
- The devices to be installed into the housing and installation compartments must at least comply with the degree of protection IP 54 according to DIN EN 60529.
- The device shall be provided in a suitable fire enclosure in the end-use application.

This is a product that corresponds to the limit values of the emitted interference of class A (industrial environments), but not of class B (residential area and small enterprises).

When using the product in residential areas or small enterprises, the operator has to take actions to prevent radio interferences (also refer to DIN EN 55022).

# 7 Technical data

| PC box | Type L | Type M | Type N | Type P | Type Q | Type R |
|---|---|---|---|---|---|---|
| Processor | Depending on the configuration, the following processors are available for all types:<br>• Intel® Core™ i7-6820EQ 2.8 GHz Quad Core Turbo Boost 3.5 GHz 8 MB L2 cache<br>• Intel® Core™ i5-6300U 2.4 GHz Dual Core Turbo Boost 3.0 GHz 3 MB cache<br>• Intel® Celeron® 3955U 2.0 GHz Dual Core 2 MB cache | | | | | |
| Chip set | The following chip sets are used depending on the processor:<br>• Core™ i7-6820EQ 2.8 GHz:<br>Intel® QM170<br>• Core™ i5-6300U 2.4 GHz:<br>Intel® 100 Series PCH-LP integrated in the multi-chip package<br>• Celeron® C3955U 2.0 GHz:<br>Intel® 100 Series PCH-LP integrated in the multi-chip package | | | | | |

| PC box | Type L | Type M | Type N | Type P | Type Q | Type R |
|---|---|---|---|---|---|---|
| RAM | • Intel® Core™ i7-6820EQ 2.8 GHz:<br>16 GB<br>• Intel® Core™ i5-6300U 2.4 GHz and Intel® Celeron® C3955U 2.0 GHz:<br>8 GB | | | | | |
| Hard disk | • At least 320 GB or<br>• 2 × 320 GB (RAID1) or<br>• At least 192 GB SSD or<br>• 2 × 192 GB SSD (RAID1) | | | | | |
| Interfaces | • 2 × RJ45, CDI interface (image and data interface to the VDP xx.3)<br>or<br>1 × RJ45, CDI+ interface (image and data interface to the VDPxx.3 and DRxx)<br>• 1 × DisplayPort<br>• 4 × USB 2.0 port (type A, external)<br>• 2 × USB 3.0 port (type A, external)<br>• 1 × USB 3.0 port (type A, internal)<br>• 2 x Ethernet port (RJ 45, 10/100/1000 Base-T)<br>• 1 × voltage connection (3-pin)<br>• 1 × mSATA connection (internal)<br>• 1 × mPCIe connection (internal) | | | | | |
| Slots | 2 × PCI | 4 × PCI | 1 × PCI<br>1 × PCIe | 2 × PCIe | 2 × PCI<br>2 × PCIe | 4 × PCIe |
| PCI card length | Max. 175 mm | | | | | |
| PCIe card length | Max. 175 mm | | | | | |
| Degree of protection | IP 20 | | | | | |
| Voltage supply | 24 V DC (use a 24 V power supply unit acc. to DIN EN 60742, classification VDE 0551, for example the power supply unit VAP01.1H-W23-024-010-NN, part number R911171065) | | | | | |
| Max. power consumption | 150 W | | | | | |
| Weight | Approx. 2.6 kg | Approx. 3.3 kg | Approx. 2.6 kg | Approx. 2.6 kg | Approx. 3.3 kg | Approx. 3.3 kg |

**Tab. 7-1:** Technical data of the PC box

The specified maximum power consumption is including the power consumption of the extension cards, refer to "Power drain of the extension cards" on page 21.

For details on the individual variants, refer to the type code (fig. 15-1 "Type code of the control cabinet PC IndraControl VPB 40.4" on page 50).

# 8 Standards

## 8.1 Standards used

### EN Standards

The system components of the control cabinet PC IndraControl VPB 40.4 correspond to the following standards:

| Standard | Title |
|---|---|
| IEC 60204-1 | Safety of machinery – |
| | Electrical equipment of machines – |
| | Part 1: General requirements |
| IEC 61010-2-201 | Insulation coordination for equipment within low-voltage systems – |
| | Part 1: Principles, requirements and tests |
| IEC 61131-2 | Programmable controllers – |
| | Part 2: Equipment requirements and tests |
| ISO 13850 | Safety of machinery – |
| | Emergency stop – Principles for design |
| IEC 60529 | Degrees of protection provided by enclosures (IP code) |
| IEC 60068-2-6 | Environmental testing – |
| | Part 2-6: Tests – |
| | Test Fc: Vibration (sinusoidal) |
| IEC 60068-2-27 | Environmental testing – |
| | Part 2-27: Tests – |
| | Test Ea and guidance: Shock |
| IEC 60721-3-1 | Classification of environmental conditions |
| | Part 3: Classification of groups of environmental parameters and their severities |
| | Section 1: Storage |

| Standard | Title |
|---|---|
| IEC 60721-3-2 | Classification of environmental conditions<br>Part 3: Classification of groups of environmental parameters and their severities<br>Section 2: Transportation |
| IEC 60721-3-3 | Classification of environmental conditions<br>Part 3: Classification of groups of environmental parameters and their severities<br>Section 3: Stationary use at weather-protected locations |

**Tab. 8-1:** Standards used

## 8.2 CE marking

### 8.2.1 Declaration of conformity

CE

The electronic products described in the present operating instructions comply with the requirements and the target of the following EU directive and with the following harmonized European standards:

EMC directive 2014/30/EC

The electronic products described in the present operating instructions are intended for use in industrial environments and comply with the following requirements:

| Standard | Title |
|---|---|
| IEC 61000-6-2 | Electromagnetic compatibility (EMC) –<br>Part 6-2: Generic standards – Immunity for industrial environments |
| IEC 61000-6-4 | Electromagnetic compatibility (EMC) –<br>Part 6-4: Generic standards – Emission standard for industrial environments |

**Tab. 8-2:** Standards for electromagnetic compatibility (EMC)

**Loss of CE conformity due to modifications at the device**

CE marking applies only to the device upon delivery. After modifying the device, verify CE conformity.

## 8.3 UL/CSA certified

c UL US LISTED

The devices are certified acc. to

- **UL508** (Industrial Control Equipment)
- **C22.2 no. 142-M1987** (CSA)

UL file no. E210730

However, there can be combinations or extension stages with a limited or missing certification. Thus, verify the registration according to the UL marking on the device.

**Loss of UL/CSA conformity due to modifications at the device**

UL and CSA marking applies only to the device upon delivery. After modifying the device, verify UL and CSA conformity.

# 9 Interfaces

***NOTICE***

**Material damages to electronics due to missing functional earth!**

Ensure that the functional earth is connected, as otherwise the electronics can be destroyed by a potential difference between the operator display and the control cabinet PC if the voltage supply is interrupted to only one device and established again. A direct connection of the functional earth between the operator display and the control cabinet PC is optimal. If the functional earth is connected to a neutral point, the control cabinet PC and the operator display have to be connected to this neutral point.

To avoid malfunctions, use only shielded cables and metallic or conductive connector/coupling housings with large-area shield support.

## 9.1 Overview

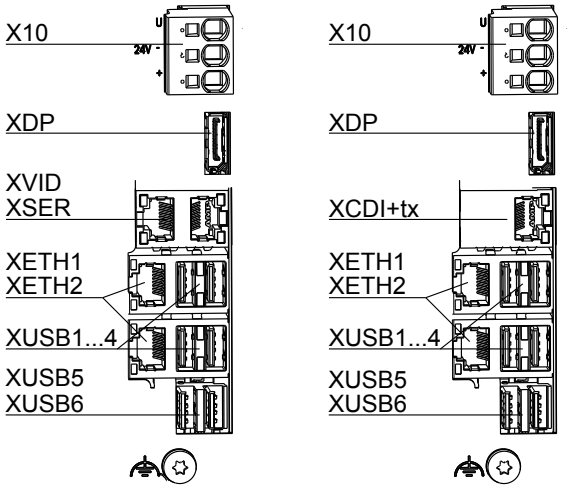



**Fig. 9-1:** Interfaces at the device

The following connections are available at the control cabinet PC:

| Name at the housing | Connection type | Connection type (at the device) | Mating connector or cable (from outside) |
|---|---|---|---|
| X10 | PC voltage supply:<br>24 V DC | Male connector terminal PC4/3-G7.62 | Socket terminal PC4/3-G7.62 |
| XDP | Connection for external monitor | DisplayPort socket, (20-pin) | DisplayPort plug, (20-pin) |
| XSER | CDI interface, data | RJ45 socket, | RJ45 plug |
| and | | 8-pin | (Twisted pair, 8-wire) |
| XVID | CDI interface, image | RJ45 socket, | RJ45 plug |
| | | 8-pin | (Twisted pair, 8-wire) |
| or | | | |
| XCDI+tx | CDI+ interface, data and image | RJ45 socket, | RJ45 plug |
| | | 8-pin | (Twisted pair, 8-wire) |
| XETH1, XETH2 | Ethernet interfaces 10/100/1000 Base-T | RJ45 socket, 8-pin | RJ45 plug<br>(Twisted pair, 8-wire) |
| XUSB1 to XUSB6 | USB interfaces | USB socket, 4-pin, type A | USB plug, 4-pin |

**Internal connections**

| Name at the housing | Connection type | Connection type (at the device) | Mating connector or cable (from outside) |
|---|---|---|---|
| | USB 3.0 interface | USB socket, 4-pin, type A | USB plug, 4-pin |
| | mSATA interface | mSATA base | |
| | mPCIe interface | mPCIe base | |
| | 2 slots or 4 slots (see "Available slots per PC box type" on page 21) | PCI/PCIe | PCI/PCIe card |

## 9.2 PC voltage supply X10

The 24 V DC voltage supply for the control cabinet PC is connected via the "X10" connection.

All voltages internally required are generated without any electrical isolation via a DC/DC converter. The connection is designed as spring terminal, SPC 5/3-ST-7,62, 3-pin, grid 7.62 mm. Connect cables to it with the conductor cross-sections listed in tab. "Conductor cross-sections permitted for the spring terminal at X10" on page 17.

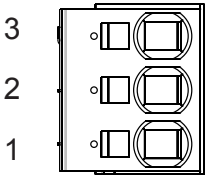



**Fig. 9-2:** 24 V DC connection, X10, pin assignment

| Pin | Labeling | Function |
|---|---|---|
| 1 | + | Supply voltage 24 V |
| 2 | – | 0 V supply voltage |
| 3 | U | Supply voltage available in front of the UPS (see chapter 10.3.2 "Connecting a UPS" on page 34) |

***NOTICE***

**Destruction of the control cabinet PC (fire hazard) due to polarity reversal of the connection at the X10 plug without additional external protection**

Ensure that the polarity at the X10 plug and the dimensioning of the fuse are correct.

**⚠ WARNING** **Danger without safe separation!**

The 24 V DC input voltage must comply with the requirements of the "safe separation"!

Plug and remove the plug connection only if there is no voltage!

### Conductor cross-sections permitted for the spring terminal at X10

| Conductors | Cross-section |
|---|---|
| Conductor cross-section inflexible, max. | 10 $mm^2$ |
| Conductor cross-section inflexible, recommended | 2.5 $mm^2$ |
| Conductor cross-section flexible, max. | 6 $mm^2$ |
| Conductor cross-section flexible, recommended | 2.5 $mm^2$ |
| Conductor cross-section flexible with core end sleeves without plastic sleeve, max. | 6 $mm^2$ |
| Conductor cross-section flexible with core end sleeves without plastic sleeve, recommended | 2.5 $mm^2$ |
| Conductor cross-section flexible with core end sleeves with plastic sleeve, max. | 4 $mm^2$ |
| Conductor cross-section flexible with core end sleeves with plastic sleeve, recommended | 2.5 $mm^2$ |
| Conductor cross-section AWG/kcmil, max. | 8 |
| Conductor cross-section AWG/kcmil, recommended | 13 |

## 9.3 USB interfaces XUSB1 to XUSB6

The devices are provided with six USB interfaces on the connector panel (XUSB1/2 XUSB3/4 and XUSB5/6). There is another USB 3.0 interface in the housing, refer to chapter 9.8 "Internal interfaces" on page 20.

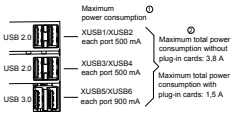



**Fig. 9-3:** Current carrying capacity of the six USB connections

①: The USB ports are monitored in pairs. If, e. g. XUSB1 switches off, as the power consumption has been exceeded (> 500 mA), XUSB2 switches off as well.

☞ ②: The specified 3.8 A are applied for the operation without further 5 V consumers (e. g. PCI plug-in cards). Limit the operation with further 5 V consumers to a total power consumption of 1.5 A to prevent that the internal power supply unit switches off accidentally.

☞ If the maximum power consumption has been exceeded, a message is displayed that the USB devices are disabled. The USB devices operate again as soon as less than 500 mA current is consumed from a USB 2.0 socket or less than 900 mA from a USB 3.0 socket. Additionally, the USB error message in the taskbar has to be acknowledged manually.

☞ Connect only USB devices which comply with the noise immunity according to the EMC directive (industrial environments). This avoids an unintended switch-off of the control cabinet PC.

☞ If there is an mPCIe module internally, a USB 2.0 device connected to XUSB5 does not operate anymore. A possibly connected USB 3.0 device is still functioning.

## 9.4 Ethernet interfaces XETH1 and XETH2

The control cabinet PC can be connected to an Ethernet network via the Ethernet interfaces XETH1 and EXTH2.

The LAN assignment under Windows to the XLAN connections at the device is set as follows by default:

| Labeling under Windows 7 | Labeling at the device |
|---|---|
| Local Area Connection | XETH1 |
| Local Area Connection 2 | XETH2 |
| **Labeling under Windows 10** | |
| Ethernet | XETH1 |
| Ethernet 2 | XETH2 |

| RJ45, socket, 8-pin | |
|---|---|
| Type: | Ethernet 10 Base-T, 100 Base-T, 1000 Base-T |
| Cable length: | 100 m max. |
| Transmission rate: | 10, 100 or 1000 MBit/s |

## 9.5 DisplayPort XDP

At the DisplayPort (XDP), a monitor with DisplayPort interface, a DVI monitor or an HDMI monitor can be connected (via adapter).

| Display port socket, 20-pin | |
|---|---|
| Max. resolution: | 4 K |

The color depth and the resolution of the VDP operator display and a monitor connected to the DisplayPort can be set in the properties of the graphic card under "Display" on the "Color settings" page. Select the respective display under "Select display".

These are the following assignments under "Select display":

- Digital display: VDP operator display
- Digital display 2: Monitor at the DisplayPort

The BIOS is configured and thus ensures that all connected output devices can be controlled while booting.

If IndraControl VPB 40.4 is supposed to simultaneously output the screen on a connected monitor at the DisplayPort and at the VDP operator display under Windows, this can be set in the properties of the graphic card:

- Click on the icon of the graphics driver in the taskbar and right-click to select "Graphic properties" from the context menu. Go to "Multiple displays" under "Display", select "Clone displays" and press **Apply**.

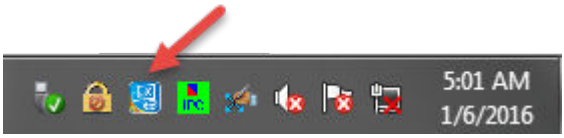



**Fig. 9-4:** Graphics driver icon in the task bar

If the screen output is only set for one display device (setting "Single display") in the properties of the graphic card, use the shortcut <Ctrl>+<Alt>+<F1> under Windows to open a dialog to toggle the screen output between the monitor at the DisplayPort and the VDP operator display.

The previously described setting options are only available if a monitor is connected to the DisplayPort.

The graphics driver stores the last output device. After a restart, the images are only output on the last saved output device.

## 9.6 CDI interfaces XVID and XSER

The CDI interface is assigned to the two RJ45 sockets XSER and XVID. Connect the operator display to these sockets. The corresponding cables are available as accessories, see chapter 5.5 "Connecting cables for the CDI interface and the CDI+ interface" on page 6.

The CDI interface includes the data interface (XSER) as well as the image interface (XVID).

The USB signals and the digital data (touch, M-keys, LEDs and control signals) are transferred via the data interface.

The DVI signals are transferred via the display interface.

To avoid malfunctions, use only cables listed in chapter 5.5 "Connecting cables for the CDI interface and the CDI+ interface" on page 6.

The CDI interfaces are color-coded on the device:

| | |
|---|---|
| CDI interface, data (XSER) | Violet |
| CDI interface, image (XVID) | Black |

## 9.7 CDI+ interfaces XCDI+tx

Connect the operating display to the CDI+ interface. The corresponding cables are available as accessories, see chapter 5.5 "Connecting cables for the CDI interface and the CDI+ interface" on page 6.

The CDI+ interface sends data signals and video signals. USB signals and digital data belong to data signals (touch, M-keys, LEDs and control signals).

To avoid malfunctions, use only cables listed in chapter 5.5 "Connecting cables for the CDI interface and the CDI+ interface" on page 6.

## 9.8 Internal interfaces

There are three more interfaces internally:

- 1 × USB 3.0
- 1 × mSATA
- 1 × mPCIe
- The USB 3.0 interface is intended for USB devices that have to be connected permanently to a USB interface, e.g. a USB dongle
- An mSATA SSD hard disk module can for example be installed in the mSATA base
- An mPCIe WLAN module can for example be installed in the mSATA base

## 9.9 Extension cards

For plugging extension cards, up to four slots for PCI cards and PCIe cards are available. The number of slots available depends on the PC box type (refer to the following table). The maximum length allowed for the cards is 175 mm.

### Available slots per PC box type

| PC box type | Slot A1 | Slot A2 | Slot A3 | Slot A4 |
|---|---|---|---|---|
| Type L | PCI | PCI | – | – |
| Type M | PCI | PCI | PCI | PCI |
| Type N | PCI | PCIe | – | – |
| Type P | PCIe | PCIe | – | – |
| Type Q | PCI | PCI | PCIe | PCIe |
| Type R | PCIe | PCIe | PCIe | PCIe |

### Power drain of the extension cards

The total power allowed to be drained from the slots depends on the processor used (refer to the following table).

| Ambient temperature | Intel® Celeron® C3955U 2.0 GHz | Intel® Core™ i5-6300U 2.4 GHz | Intel® Core™ i7-6820EQ 2.8 GHz |
|---|---|---|---|
| Up to 35 °C | 111 W | 111 W | 81 W |
| 35 °C to 45 °C | 70 W | 70 W | 50 W |

# 10 Mounting, demounting and electric installation

## 10.1 Installation notes

### 10.1.1 Cables routing

- Lay all connecting cables in loops and use strain reliefs for all cables
- Keep the maximum distance possible from interference sources
- Do not route the CDI and CDI+ cables in parallel to motor cables or to other noise sources, as the CDI connection can be disturbed

### 10.1.2 Housing distances for maintenance tasks

Provide a space on all sides of the device for sufficient cooling and cable routing

Comply with the following housing distances to execute maintenance tasks directly at the device in the control cabinet:

- To maintain the fan and exchange the battery, go up by 120 mm (refer to the following figure)
- For changing the hard disk 150 mm to the front (refer to the following figure)
- In the installed state, the internal connections of USB, mSATA and mPCIe have to be accessible. Ensure sufficient distance on the right. For the position of the connections, refer to chapter 10.1.3 "Internal connections for USB, mSATA modules and mPCIe modules" on page 22

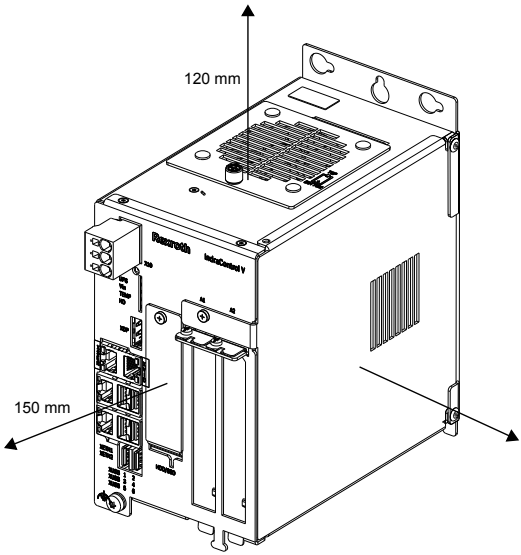
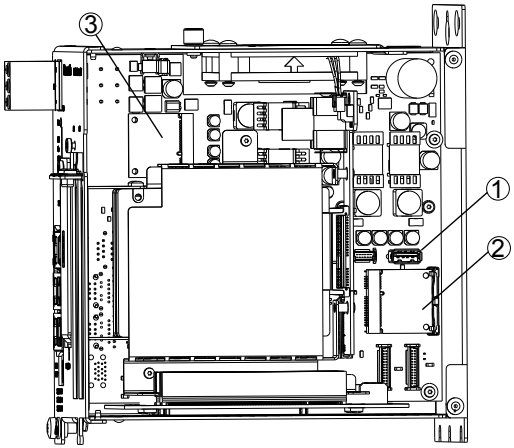



**Fig. 10-1:** Housing distances for maintenance tasks

### 10.1.3 Internal connections for USB, mSATA modules and mPCIe modules




① USB 3.0
② mSATA
③ mPCIe

**Fig. 10-2:** Position of the internal interfaces

**Possible restrictions for the 2-slot variant:**

When using a PCI card or a PCIe card with a card length > 145 mm, the USB port is covered by the card. The USB port can then only be used for very short USB sticks (e.g. mouse radio receiver).

**Mounting an mSATA SSD hard disk module at the 2-slot variant:**

The mSATA SSD hard disk module has to be installed before installing a PCI card or a PCI card with a card length > 145 mm, as the mSATA base of the plug-in card is covered after mounting such cards.

### 10.1.4 Connecting USB device, mSATA module and mPCIe module at the internal connection

It is recommended to install the modules to be mounted before mounting the control cabinet PC into the control cabinet.

***NOTICE*** **Damages to the device due to electrostatic discharges!**

Comply with all ESD protective measures while working with modules and components! Avoid electrostatic discharges!

***NOTICE*** **Risk of damage to the IndraControl VPB 40.4 by mounting non-released modules and USB devices!**

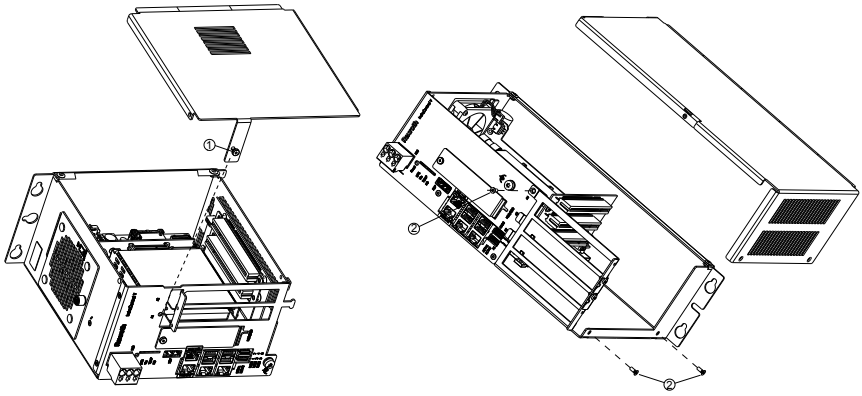
- Install only released modules and USB devices
- Modules and USB devices may only be installed by authorized personnel

*Steps 1 - 4 are omitted if the control cabinet PC is not yet mounted into the control cabinet.*

1. Switch off the supply voltage.
2. If operated with a UPS, wait until the control cabinet PC switches off automatically. The UPS LED on the connector panel of the control cabinet PC is red until the UPS switches off the power supply unit.
3. Remove all plugs from the control cabinet PC.
4. Loosen the fastening screws of the control cabinet PC and remove the control cabinet PC from the mounting panel.
5. Position the control cabinet on a plane support and ensure that the right housing cover points up.

6. 2-slot variants: Loosen the fastening screw (cross recess) of the housing cover (refer to ① in the following figure).

   4-slot variants: Remove the fastening screws of the housing cover (refer to ② in the following figure).



① Fastening screw of the housing cover of 2-slot variants
② Fastening screws of the housing cover of 4-slot variants

**Fig. 10-3:** Position of the housing cover and the fastening screw(s)

7. Remove the housing cover.
8. Plug the USB device into the USB port or plug the mSATA module or the mPCIe module into the intended slot.
9. Mount the housing cover again.

### 10.1.5 Installing extension cards

**NOTICE** **Damages to the device due to electrostatic discharges!**

Comply with all ESD protective measures while working with modules and components! Avoid electrostatic discharges!

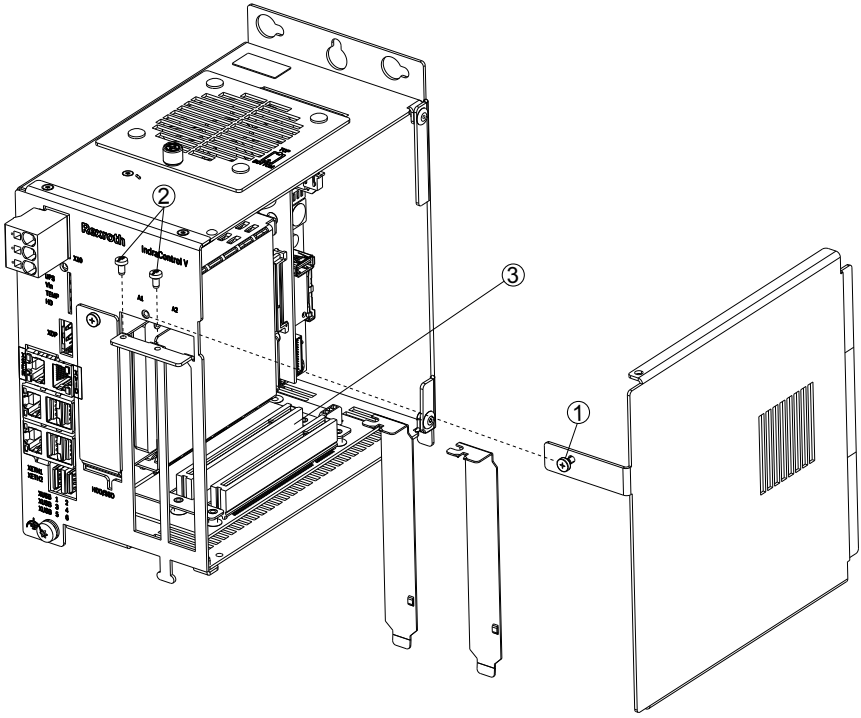
**NOTICE** **Risk of damage to the IndraControl VPB 40.4 or corruption of application software due to the use of non-released extension cards!**

- Install only released extension cards
- The extension cards may only be installed by authorized personnel

*Steps 1 - 3 are omitted if the control cabinet PC is not yet installed in the control cabinet.*

1. Switch off the supply voltage.
2. If operated with a UPS, wait until the control cabinet PC switches off automatically. The UPS LED on the connector panel of the control cabinet PC is red until the UPS switches off the power supply unit.
3. Remove all plugs from the control cabinet PC.
4. **Control cabinet PC with two slots:**

   Loosen the undetachable fastening screw (cross recess) of the housing cover (refer to ① in the following figure).

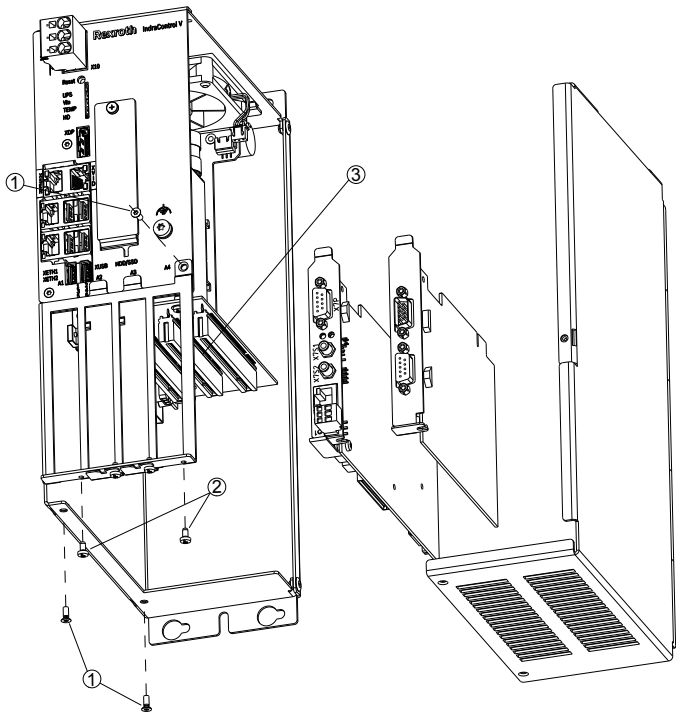



① Fastening screw of the housing cover (cross recess)
② Fastening screws of the slot covers (internal hexagon T10)
③ 2 PCI/PCIe slots (depends on the PC box type)

**Fig. 10-4:** Position of the housing cover and of the fastening screws for control cabinet PCs or two slots

**Control cabinet PC with four slots:**

Remove the fastening screws (internal hexagon T10) of the housing cover (see ① in the following table).




① Fastening screws of the housing cover (internal hexagon T10)
② Fastening screws of the slot covers (internal hexagon T10)
③ 4 PCI/PCIe slots (depends on the PC box type)

**Fig. 10-5:** Position of the housing cover and of the fastening screw for control cabinet PCs with four slots

5. Remove the housing cover.
6. Remove the fastening screw (internal hexagon T10) of the slot cover and the slot cover itself.
7. Insert the extension card and fix it using a fastening screw.
8. Mount the housing cover.

If the card is equipped with a Plug-and-Play (PnP) function, the card is automatically detected by the operating system and integrated into the system, provided that there are no hardware conflicts (IRQ etc.) with other extension cards or connected devices.

There are the following causes if the functions of the new card are not available after the system boot:

- The card is not correctly positioned in the slot
- The driver software of the card is not or incorrectly installed

- IRQ (Interrupt) conflict with other PC hardware components of the control cabinet PC
- The software of the card was not installed

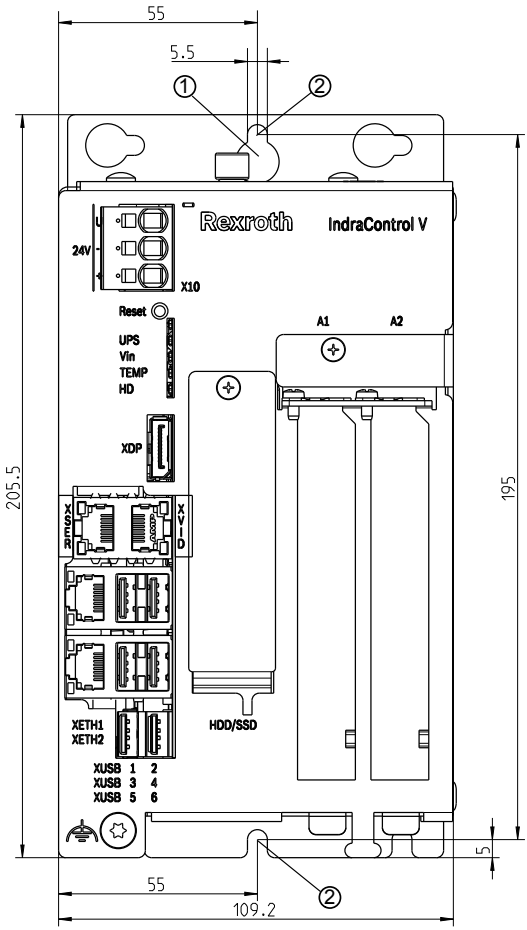
### 10.1.6 BIOS settings

No further settings have to be made in the BIOS setup. The corresponding settings have already been set for the normal operation.

## 10.2 Housing dimensions

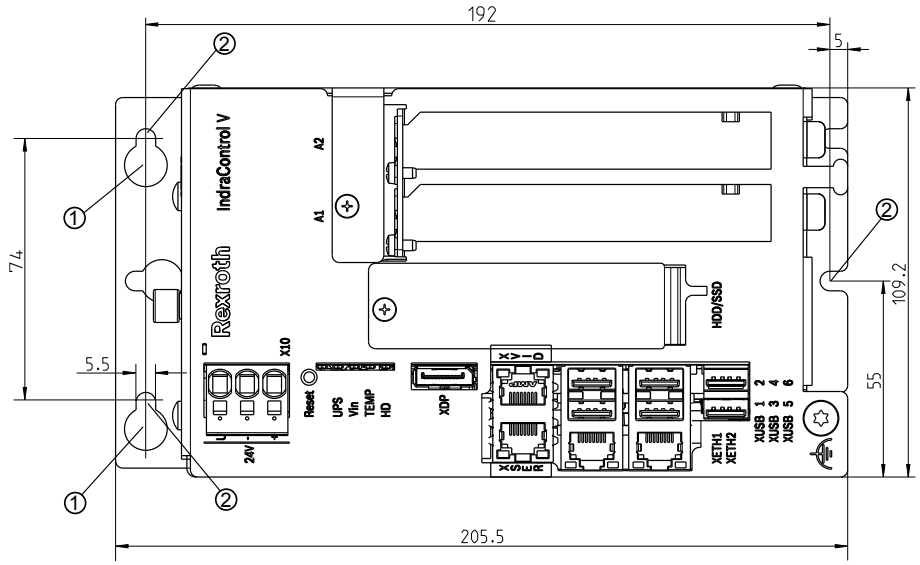
The control cabinet PC can be mounted using mounting holes. For the corresponding dimensions, please refer to the following figures:

Fix the devices with M5 screws.



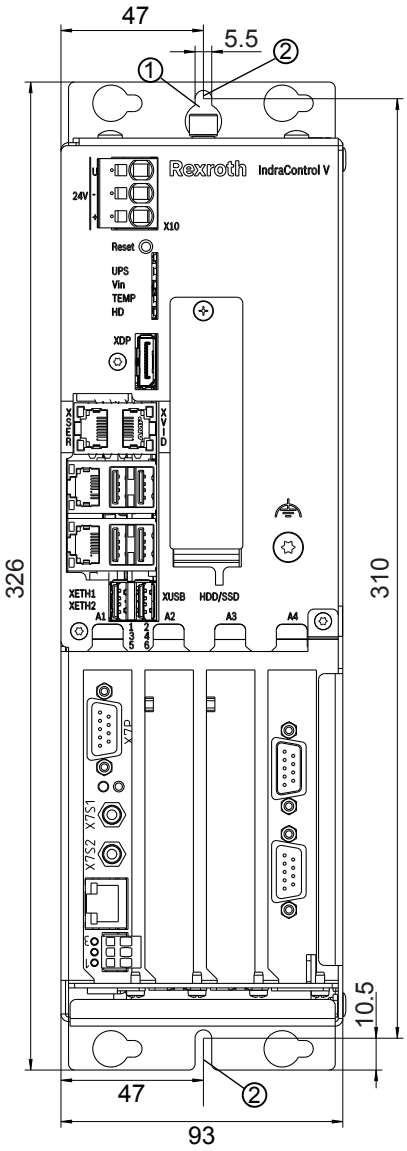

① Keyhole for vertical mounting
② Slots to hang in the device

**Fig. 10-6:** Housing dimensions for devices with two slots, vertical mounting



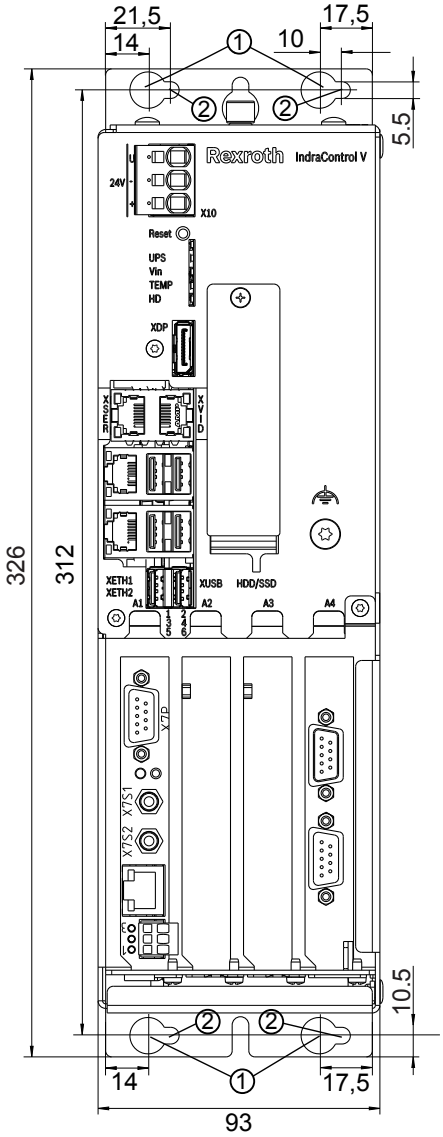

① Keyholes for horizontal mounting
② Slots to hang in the device

**Fig. 10-7:** Housing dimensions for devices with two slots, horizontal mounting




① Keyhole for vertical mounting
② Slots to hang in the device

**Fig. 10-8:** Housing dimensions, devices with four slots, vertical mounting




① Keyholes for horizontal mounting
② Slots to hang in the device

**Fig. 10-9:** Housing dimensions, devices with four slots, horizontal mounting

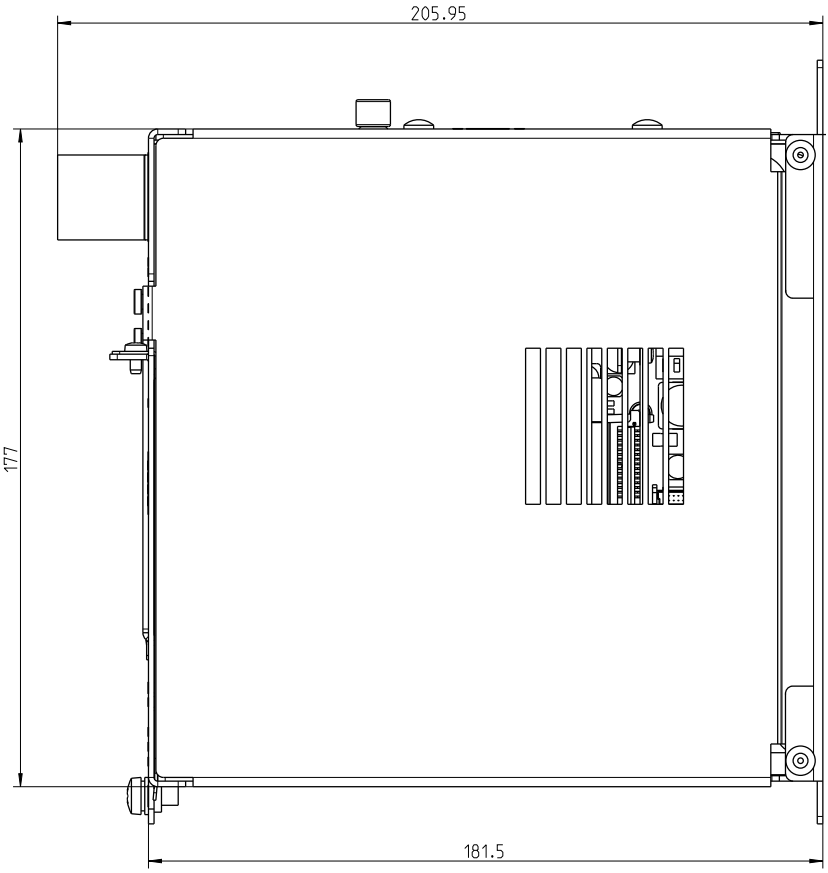



**Fig. 10-10:** Housing dimensions, devices with two slots, side view from the right

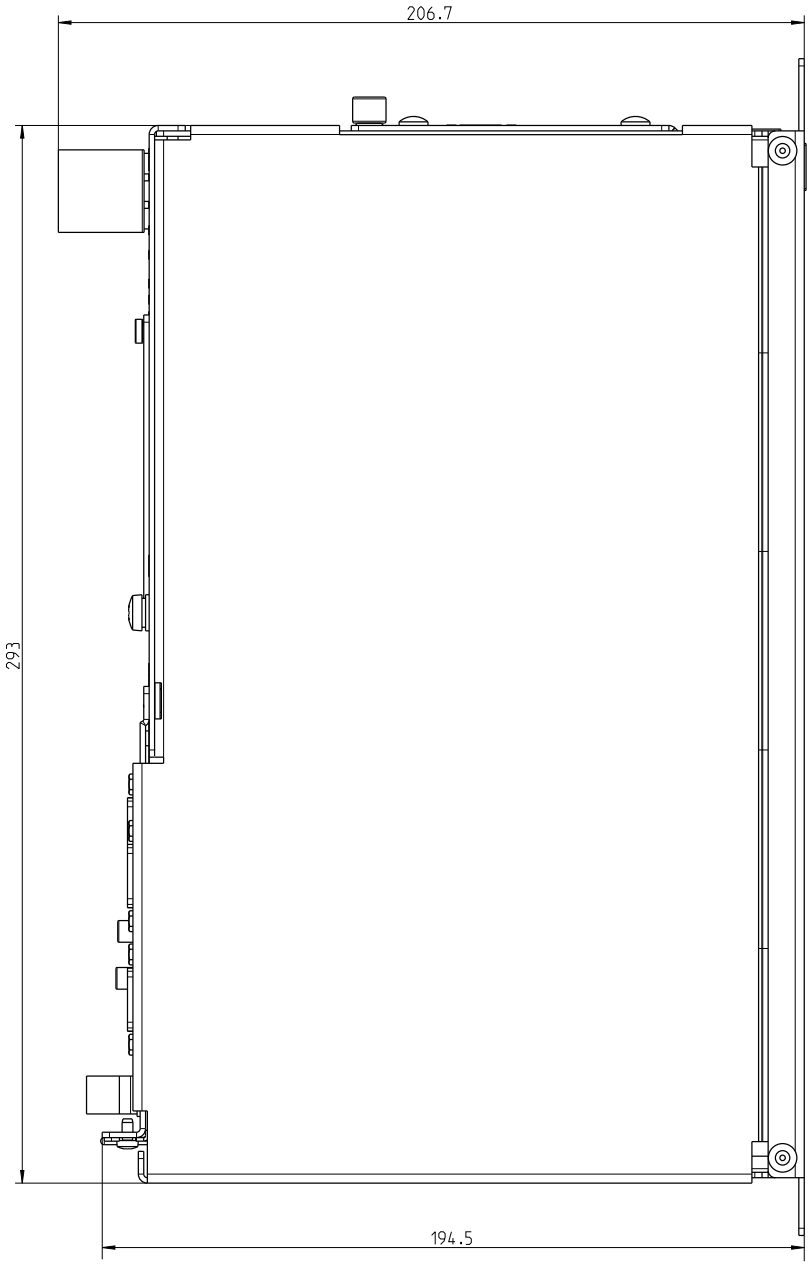



**Fig. 10-11:** Housing dimensions, devices with four slots, side view from the right

## 10.3 Electric connection

### 10.3.1 Connecting 24 V supply to the control cabinet PC

1. Connect the functional earth.

2. Connect the "X10" interface for the 24 V voltage supply to the industrial power supply unit or to the UPS (if available).

   For details on how to connect to a UPS, refer to chapter 10.3.2 "Connecting a UPS" on page 34.

**NOTICE** **Material damages to electronics due to missing functional earth!**

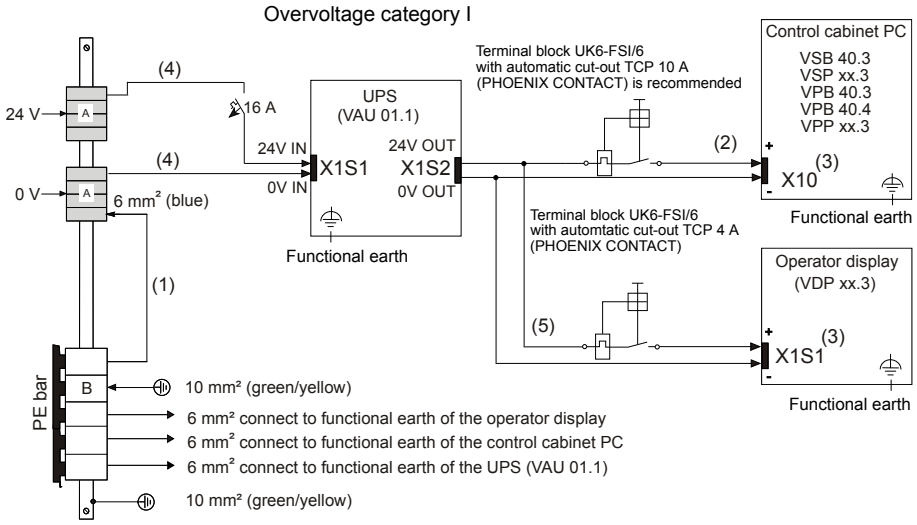
Ensure that the functional earth is connected, as otherwise the electronics can be destroyed by a potential difference between the operator display and the control cabinet PC if the voltage supply is interrupted to only one device and established again. A direct connection of the functional earth between the operator display and the control cabinet PC is optimal. If the functional earth is connected to a neutral point, the control cabinet PC and the operator display have to be connected to this neutral point.

Use a 24 V industrial power supply unit acc. to DIN EN 60742, classification VDE 0551, for example "VAP01.1H-W23-024-010-NN" (part number R911171065) for the voltage supply.

### 10.3.2 Connecting a UPS

Please note that the maximum power consumption of the control cabinet PC does not exceed the maximum output power of the UPS.

## Connection diagram




**A** Terminal block 4 mm²
**B** Terminal block 10 mm²
① Easy to remove and visible
② Cable length between the UPS and the control cabinet PC is max. 2 m at a cross-section of min. 2.5 mm²
③ Polarity reversal of the X1S1 and X10 plugs can sporadically result in destruction of the device (fire hazard) if no additional external protection is provided. The reason is a simultaneous grounding of the 0 V of the device and of the 0 V (PELV) (1)
④ Cable length between the +24 V power supply unit and the UPS: 1 m to 7 m, 2.5. mm² cross-section, 8 m to 10 m, 4.0 mm² cross-section (refer to the documentation of the UPS VAU01.1)
⑤ Cable length between the +24 V power supply unit and the operator display is max. 30 m at a cross-section of min. 1.5 mm². If the cable length exceeds 30 m, a separate power supply unit is required

**Fig. 10-12:** Control cabinet PC and operator display connected to a UPS

## UPS with USB interface

When connecting a 24 V power supply unit to a USB interface at the control cabinet PC, information on the existence and the status of the UPS are communicated to the control cabinet PC.

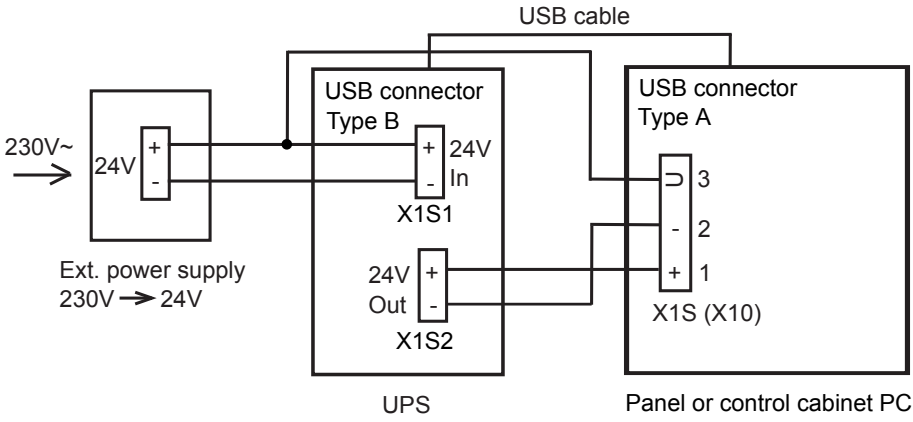



**Fig. 10-13:** Preferred wiring: Connection scheme with power supply unit, UPS and panel PC or control cabinet PC for normal mode with fallback and simple mode

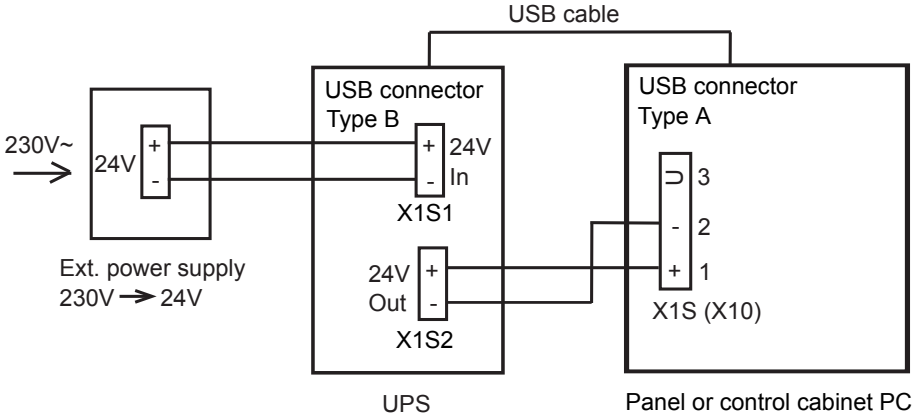



**Fig. 10-14:** Connection scheme with power supply unit, UPS and panel PC or control cabinet PC without fallback and simple mode

The communication is established via a virtual COM interface. This virtual COM interface is provided by the USB interface.

The driver is installed after the first connection of the UPS via the USB cable. A virtual COMn (e.g. COM3) interface is created in the operating system.

### UPS without USB interface

To identify the connection of this UPS using the power supply electronics in the control cabinet PC, connect the 24 V voltage (24V In) applied to the UPS input to pin 3 of the X10 (U).

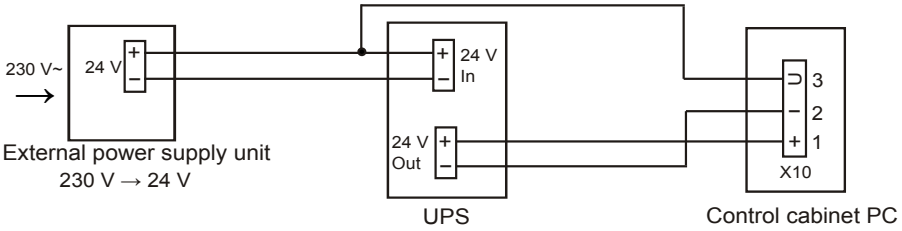



**Fig. 10-15:** Connecting an external UPS without communication to the control cabinet PC

**NOTICE**

**Wrong initialization of the CDI interface and no image output at the connected display VDP xx.3 if the input voltage has been switched on too early**

If the control cabinet PC is shut down under Windows and the 24 V input voltage is switched off, the input voltage can only be switched on again when the $V_{IN}$ LED is off.

## 10.3.3 Recommendation when mounting of CDI cables with long lengths in an interference-prone environment

The CDI cable is a connection cable with RJ45 plug to connect the CDI interface of the control cabinet PC to the remote operator display or the Y-repeater.

The mounting recommendations described in the following facilitate an optimized signal transmission. In particular in case of great cable lengths and distances between the control cabinet PC and the remote operator display, ensure that the cable is installed correctly and that the shield is connected correctly.

### Cables routing

Comply with the following when routing the cables:

- Keep the maximum possible distance to interference-prone cables and lines
- Limit parallel routing with other lines
- Keep the maximum possible distance to sources of interference such as drives and frequency converters
- Mechanical protection against tensile load and compressive load on the cables

- Comply with the permissible bending and torsional stress of the cable

### Potential equalization

Ensure that there are no compensating current flows via the cable shield of the CDI cables between device and machine parts while creating the equipotential bonding.

### Shielding

The shielding is an important component of the CDI cable. The shielding is used to shield the data wires in the cable against electrical interferences from the environment.

The shielding has to be connected to the potential equalization of the devices to shield the data wires. In most cases, a connection via the RJ45 plugs is sufficient.

Avoid collection of dirt at the R45 plug while drawing the cables in the system.

Remove any collection of dirt from the shield surfaces of the RJ45 plug before plugging it in.

**Fig. 10-16:** RJ45 plug shielding areas

### Additional shielding connection in case of strong electrical interferences and long cables

In case of strong electrical interferences and long cable lengths, it can be required to additionally connect the shielding to the earthing potential.

Mount suitable EMC shielding clamp close to the control cabinet PC, the remote operator display or the Y-repeater.

Ensure that the CDI cable is not crimped when connecting the shielding to the equipotential bonding. Avoid mechanical stress (tensile, compressive) on the plug. Use an EMC shielding clamp suitable for the cable diameter. Crimping of the cable impairs the electrical properties of the CDI cable.

Observe the following when mounting the shield connection:

1. Only remove the CDI cable jacket on the length required for the connection.

The CDI cable is sensitive to mechanical load where the jacket was removed. Ensure that the CDI cable shielding is not damaged when removing the cable jacket.

**Fig. 10-17:** CDI cable with RJ45 plug

**Fig. 10-18:** CDI cable with partially removed jacket

2. Remove the foil shield.

CDI cables are equipped with an additional foil shield. The foil shield must not be used for the connection. The foil shield is usually plastic-coated on one side for an improved stability. The plastic coating is insulating.

**Fig. 10-19:** Foil shield of the CDI cable

**Fig. 10-20:** Foil shield removed

3. Fasten cable with EMC shielding clamp.

Ensure that the CDI cable is not crimped when connecting the shielding to the equipotential bonding. Use an EMC shielding clamp suitable for the cable diameter. Crimping of the cable impairs the electrical properties of the CDI cable. Avoid mechanical stress (tensile, compressive) on the plug.

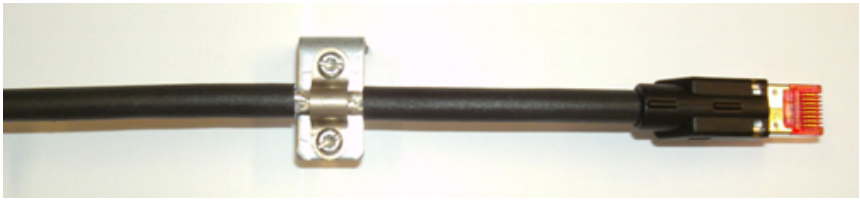


**Fig. 10-21:** Example: Attached shielding clamp

More shielding clamps:


① Company Ikotec
② Company Phoenix Contact

**Fig. 10-22:** Shielding clamps

# 11 Commissioning

The product can be used directly. No configuration is required.

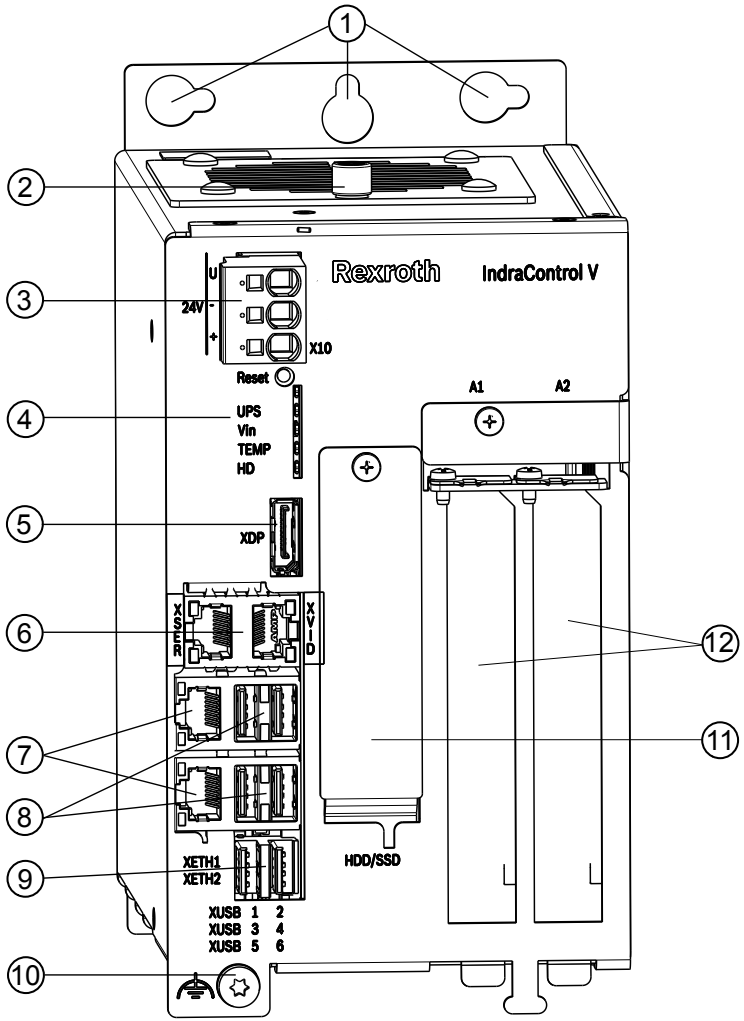
For software descriptions, refer to the project planning manual "IndraControl V-Devices Operating Systems" (see tab. 1-2 "Related documents" on page 2). The following functions are described in this project planning manual:

- Settings for dual monitor operation
- Data backup using the "Acronis" backup and recovery software
- Software for UPS monitoring
- Software for touch calibration and SMART analysis
- Simulation of the right mouse key
- Hardware event monitoring with response trigger
- Auto login
- M-key UpperClass filter for downwards compatibility of the M-key codes
- RAID system for higher data security and fast data access

## 11.1 IT security

The operation of installations, systems and machines requires the implementation of an integral concept for state-of-the-art IT security. Bosch Rexroth products are part of this integral concept. Bosch Rexroth product characteristics have to be taken into consideration in an integral IT security concept. The relevant characteristics are documented in the IT security guideline (R911342562).

# 12 Device description




① Keyholes for mounting
② Knurled screw of the fan cover
③ Plug for voltage supply
④ Status LEDs and “Reset” button
⑤ DisplayPort
⑥ CDI+ interface (1 x RJ45) or CDI interfaces (2 x RJ45)
⑦ 2 × Ethernet interfaces
⑧ 4 × USB 2.0 interfaces
⑨ 2 × USB 3.0 interfaces
⑩ Grounding screw (hexalobular T25)
⑪ Hard disk cover
⑫ 2 × slots for extension cards

**Fig. 12-1:** Front view of an IndraControl VPB 40.4 control cabinet PC, types L, N, P

**NOTICE** **Data loss caused by incorrect switch-off without UPS**

In case of a missing UPS, shut down the control cabinet PC via the software of the operating system only and not by interrupting the current supply. **This applies particularly to RAID systems.**

## 12.1 Operating and error displays

There are four LEDs on the connector panel of the IndraControl VPB 40.4 to display the device states and errors. Apply the specified measure if one of the following LEDs either indicates an error or a note, see tab. 12-1 "LEDs for operating and error display on the connector panel" on page 43.

Some LEDs, e.g. the CPU temperature monitoring, are only active if the service software has been configured accordingly.

| LED | Display | Description | Action |
|---|---|---|---|
| $V_{in}$ | LED green | Normal operation | – |
| | LED off | No supply voltage (24 V DC) | Check the supply voltage at the power supply unit! |
| TEMP | LED off | Normal operation | – |
| | LED is flashing red (flashing frequency approx. 2 Hz) | Fan is not rotating or is rotating too slowly | Check the fan on the control cabinet PC! |
| | LED is red | Overtemperature | Reduce the ambient temperature! |
| UPS | LED off | Normal operation | – |
| | LED red | The control cabinet PC is currently operating in battery mode, i. e. no supply voltage is available! | Restore the power supply and initiate a controlled restart! |

| LED | Display | Description | Action |
|---|---|---|---|
| HD | LED flashing green | Hard disk access | – |
| | LED is flashing green (with a flashing frequency of approx. 2 Hz)[1)] | Warning: SMART analysis is identifying errors.<br>Observe that this warning message is **not** displayed if RAID is used | Exchange hard disk |
| Reset | LED is red | Monitoring LED for the “Reset” button. The LED is on as long as the “Reset” button is pressed | – |

**Tab. 12-1:** LEDs for operating and error display on the connector panel

***NOTICE***

**Wrong initialization of the CDI interface and no image output at the connected display VDP xx.3 if the input voltage has been switched on too early**

If the control cabinet PC is shut down under Windows and the 24 V input voltage is switched off, the input voltage can only be switched on again when the $V_{IN}$ LED is off.

# 13 Error causes and troubleshooting

For information on the error display on the front panel, refer to chapter 12.1 "Operating and error displays" on page 43.

| Errors | Troubleshooting |
|---|---|
| Wrong display resolution | • Set the correct display resolution in the graphics driver<br>• Restart the control cabinet PC |
| The device switches off unintendedly | Check the max. current consumption of the connected USB devices |

*1) Provided that the IPC Service program (IPCSvc) is installed*

| Errors | Troubleshooting |
|---|---|
| No image output | For CDI interfaces:<br>• Check that both CDI cables (XSER and XVID) are connected<br>• Check that the CDI cables (XSER and XVID) are not interchanged<br>For CDI+ interfaces:<br>• Check whether the CDI+ cable is connected |
| No or incorrect network data transmission if the data transmission rate is set manually | The network card of the remote station has to be able to process the same data transmission rate as the control cabinet PC. If necessary, change the data transmission rate under **Control Panel ▶ Network Card** |

**Tab. 13-1:** Error causes and troubleshooting

Repairs at the device by the customer are not permitted. Exceptions are maintenance works listed in the chapter "Maintenance".

For further information in the event of repair, please contact the Bosch Rexroth Service.

# 14 Maintenance

Only the maintenance works at the device listed in this chapter are permitted.

For further information in the event of repair, please contact the Bosch Rexroth Service.

***NOTICE*** **Dissolving the labeling at the device by solvents!**

- Do not use any solvents (e. g. diluents) for cleaning!

***NOTICE*** **Destruction of screw terminals, insufficient contact and loss of UL certification if no copper wire is used or due to wrong tightening torque.**

Use only copper wire for wiring the connection terminals. Tighten the screws of the screw terminals with the following torque:

| Thread | Mounting torque |
|---|---|
| M2,5 | 0.4 Nm |
| M3 | 0.7 Nm |
| M4 | 1.4 Nm |
| M5 | 2.8 Nm |

**Tab. 14-1:** Tightening torques

Ensure that the IP degree of protection of the device is kept during maintenance.

Include the following tasks into the maintenance schedule:

- Check all plug and terminal connections of the components for proper tightness and possible damage at least annually. Check that cables are not broken or crushed. Replace damaged parts immediately
- Check the fan regarding soiling and increased running noise at least annually

Function compatibility for spare parts is ensured for at least ten years.

## 14.1 Hard disks

The standard hard disk is mounted on a carrier plate that can be pulled out from the housing after removing the cover. The hard disk can be replaced, including the installation frame.

***NOTICE*** **Damages to the device due to electrostatic discharges!**

Comply with all ESD protective measures while working with modules and components! Avoid electrostatic discharges!

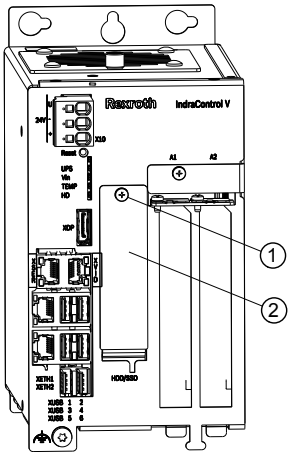
To avoid data loss and new installation of the operating system and application programs, backup hard disk data regularly.

The new hard disk, including the installation frame, is provided upon delivery. The new hard disk is always installed with the installation frame.

To exchange a hard disk, proceed as follows:

1. Store all required user data as well as the operating system settings of your system either on an external storage medium or via the network connection!

2. Switch off the supply voltage.
3. If operated with a UPS, wait until the control cabinet PC switches off automatically. The UPS LED on the connector panel of the control cabinet PC is red until the UPS switches off the internal power supply unit.
4. Remove all plugs.
5. Remove the screw of the hard disk cover on the front panel of the control cabinet PC. Now the hard disk carrier including the hard disk(s) can be pulled out from the housing.




① Screw of the hard disk cover
② Hard disk cover

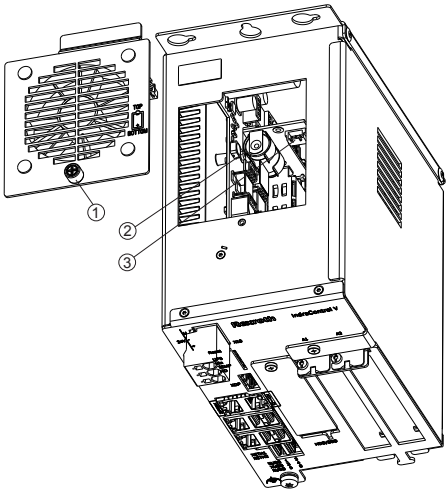
**Fig. 14-1:** Position of the hard disk carrier

6. The new hard disk parameters are detected automatically by the system. If the operating system does not boot automatically after switch-on, do interrupt the power supply for at least ten seconds and then restart.
7. After booting the control cabinet PC, restore the user data and the operating system settings for the normal operation.

If an SSD (Solid State Drive) is used, avoid defragmentation. Thus, the wear of the SSD reduces.

## 14.2 Fan

The fan is located on the top in the PC box.




① Knurled screw of the fan tray
② CMOS battery
③ Fan plug connection

**Fig. 14-2:** Fan tray

**⚠ CAUTION** **Risk of injury by rotating fan impeller!**

Do not touch the fan impeller with your hands and ensure that it does not come into contact with other objects.

### Exchanging the fan

1. Disconnect the control cabinet PC from voltage.
2. Loosen the knurled screw.
3. Carefully remove the fan (including the fan cover).
4. Remove the supply cable of the fan from the board of the control cabinet PC.
5. Connect the supply cable of the new fan to the board of the control cabinet PC.
6. Install the new fan.
7. Tighten the knurled screw.

☞ The connecting cable of the fan is connected to a PCB via a plug connection.

The cable may not be attached to anything and must **not be crimped**. The connecting cable of the fan has to be installed in an "upward-directed" loop while mounting the fan!

## 14.3 CMOS battery

The battery used to buffer remanent data (clock etc.) has a limited service life (see chapter 5.8 "Wear parts" on page 8).

For the position of the lithium battery in the control cabinet PC, refer to fig. 14-2 "Fan tray" on page 48.

**⚠ WARNING** **Batteries can cause fire, explosions or chemical burn.**

Do not load, remove, destroy, burn or heat batteries over 100 °C. Dispose old batteries immediately and properly. Keep away from children!

**Battery exchange**

1. Disconnect the control cabinet PC from voltage.
2. Loosen the knurled screw of the fan module, see fig. 14-2 "Fan tray" on page 48.
3. Carefully remove the fan (including the fan cover).
4. Remove the empty battery.
5. Insert the new battery, positive terminal to the bottom (observe the label on the battery!).
6. Insert the fan again.
7. Tighten the knurled screw.

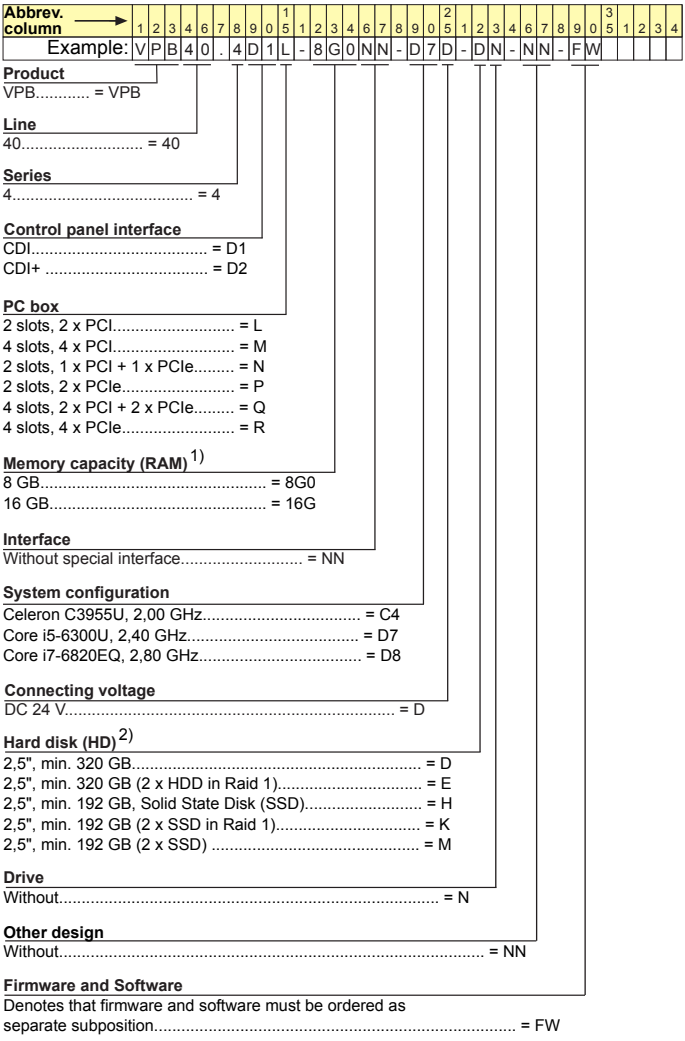
☞ The connecting cable of the fan is connected to a PCB via a plug connection.

The cable may not be attached to anything and must **not be crimped**. The connecting cable of the fan has to be installed in an "upward-directed" loop while mounting the fan!

# 15 Ordering information

For ordering information on accessories and spare parts, please refer to chapter 5 "Spare parts, accessories and wear parts" on page 6.

The control cabinet PC IndraControl VPB 40.4 is available in different variants according to the following type code.




**Note:**

1) Memory capacity „8G0" is only available with system configuration „C4" and „D7"
Memory capacity „16G" is only available with system configuration „D8"
By the memory capacity it is a minimum disclosure

2) Hard disk (HD) „E" is only available with system configuration „D7" and „D8"
Harddisk (HD) „K" is only available with system configuration „D7" and „D8"

**Fig. 15-1:** Type code of the control cabinet PC IndraControl VPB 40.4

# 16 Disposal

For disposal, unmount the devices completely. Recycle the different materials individually. Housing parts belong to metal.

Dispose the electronic components of the device, e.g. PCBs and hard drives as defined in the electronic equipment act.

## 16.1 Return

For disposal, our products can also be returned free of charge. However, the products must be free from remains such as oil, grease or other impurities.

Furthermore, the products returned for disposal must not contain any undue foreign substances or external components.

Send the products free of charge to the following address:

Bosch Rexroth AG
Electric Drives and Controls
Bürgermeister-Dr.-Nebel-Straße 2
97816 Lohr am Main, Germany

## 16.2 Packaging

The packaging material consists of cardboard, plastics, wood or styrofoam. Packaging material can be recycled anywhere.

For ecological reasons, please do not return empty packages.

## 16.3 Batteries and accumulators

Batteries and accumulators can be labelled with this symbol.

The symbol indicating "separate collection" for all batteries and accumulators is the crossed-out wheeled bin.

The end user within the EU is legally obligated to return used batteries. Outside the validity of the EU Directive 2006/66/EC keep the stipulated directives.

Used batteries can contain hazardous substances, which can harm the environment or the health of the individual when they are stored incorrectly or disposed of.

After use, the batteries or accumulators contained in Rexroth products have to be disposed of according to the country-specific collection system.

# 17 Service and support

Our worldwide service network provides an optimized and efficient support. Our experts offer you advice and assistance should you have any queries. You can contact us **24/7**.

### Service Germany

Our technology-oriented Competence Center in Lohr, Germany, is responsible for all your service-related queries for electric drive and controls.

Contact the **Service Hotline** and **Service Helpdesk** under:

| | |
|---|---|
| Phone: | **+49 9352 40 5060** |
| Fax: | **+49 9352 18 4941** |
| E-mail: | service.svc@boschrexroth.de |
| Internet: | http://www.boschrexroth.com |

Additional information on service, repair (e.g. delivery addresses) and training can be found on our internet sites.

### Service worldwide

Outside Germany, please contact your local service office first. For hotline numbers, refer to the sales office addresses on the internet.

### Preparing information

To be able to help you more quickly and efficiently, please have the following information ready:

- Detailed description of malfunction and circumstances
- Type plate specifications of the affected products, in particular type codes and serial numbers
- Your contact data (phone and fax number as well as your e-mail address)

# Index

## Notes

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