

Rexroth IndraControl VDP 16.3, VDP 40.3, VDP 60.3 Operator Display

R9111336378
Edition 03

Operating Instructions



Record of Revision

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Editorial Department

Development automation systems control hardware HB (KaWa/PiGe)

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1 About this Documentation

Overview – target groups and product phases

The activities, product phases and target groups that refer to the present documentation are marked in red color in the following figure.

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

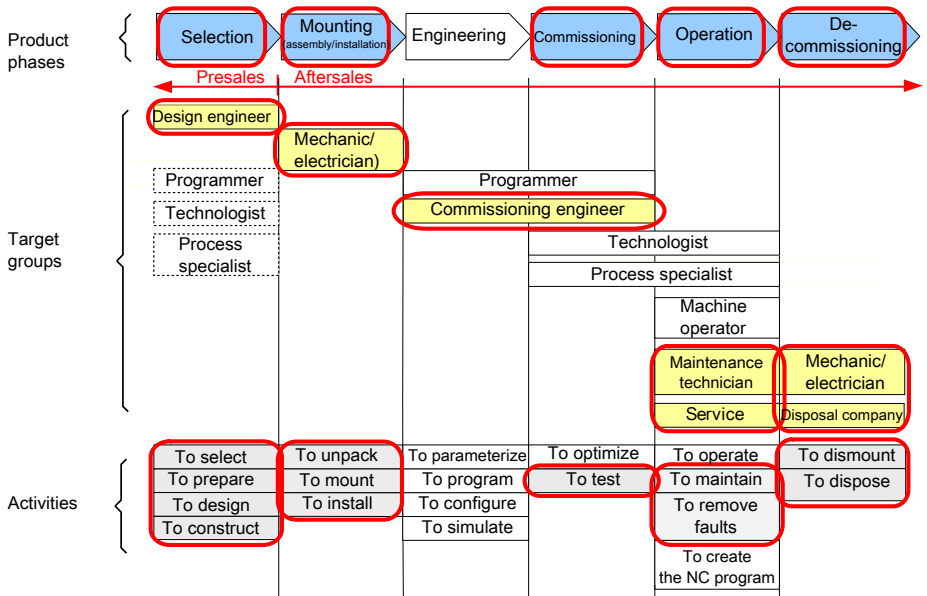


Fig. 1-1: Assigning the present documentation to the target groups, product phases and activities of the target group

Purpose

This document instructs the technical staff of the machine manufacturer on how to perform the mechanic and electrical installation in a safe way and on how to commission the device.

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

Scope

This document is valid for all variants, whose type designation code starts with "VDPxx.3..." and do not contain "...CG...".

The type designation code specifications are located on the type plate of the device, see also [chapter 2.1 "Product Identification" on page 2](#).

Further documents

Title	Part number and document type
Rexroth IndraControl VAP 01 Power Supply Unit	R911339613 Operating Instructions
Rexroth IndraControl VAU 01.1 UPS with Communication Interface	R911336867 Operating Instructions
Rexroth IndraControl VAC 01 Y-Repeater	R911336973 Operating Instructions
Rexroth IndraControl V Devices Operating Systems	R911343901 Project Planning Manual

Tab. 1-1: Required and supplementing documentation

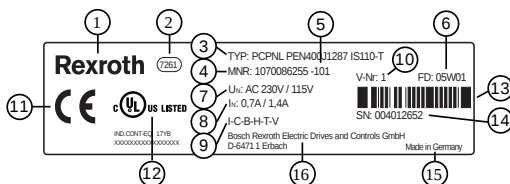
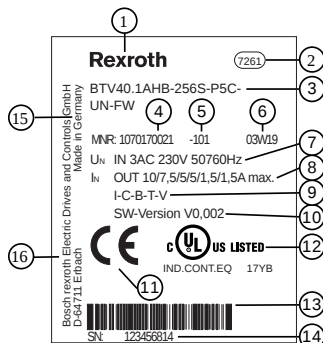
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2 Product Identification and Scope of Delivery

2.1 Product Identification

The type plate is located on the rear panel.



- 1 Logotype
- 2 Division or plant number
- 3 Type code (type designation code)
- 4 Parts number
- 5 State of revision
- 6 Date of manufacture (yyWww)
- 7 Nominal voltage
- 8 Nominal current

- 9 Test marking
- 10 Version number
- 11 CE marking
- 12 Underwriters Laboratories Inc. mark
- 13 Serial number as barcode
- 14 Serial number
- 15 Designation of origin
- 16 Company address

Fig. 2-1: Type plates, example

2.2 Scope of Delivery

- Operator Display
- Safety instructions
- Mounting kit
- 24 V female connector strip

3 Using the Safety Instructions

3.1 Safety Instructions – Structure

The safety instructions are structured as follows:

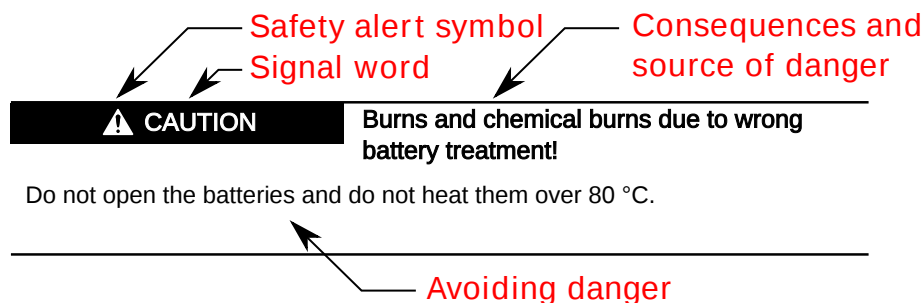


Fig. 3-1: Safety instructions – Structure

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 is meant to draw the reader's attention to the safety instruction and signifies the degree of danger.

The safety alert symbol (a triangle with an exclamation point), which precedes the signal words danger, warning and caution is used to alert the reader to personal injury hazards.

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 **could** occur.

NOTICE

In case of non-compliance with this safety instruction, property damage **could** occur.

3.3 Symbols Used

Notes are displayed as follows:



This is a note.

Tips are displayed as follows:



This is a tip.

4 Intended Use

The Bosch Rexroth operator terminals are passive operation and visualization terminals. They form a PC-based operator terminal when used with a Bosch Rexroth control cabinet PC.

NOTICE

Danger of destruction of the device if not expressly stated accessories, mounting parts and other components, cables, lines, software and firmware are used.

The operator displays may be used only as intended and with the accessories, mounting parts and other components specified in this documentation. Components that are not expressly mentioned must neither be attached nor connected. The same applies to cables and lines.

Operation must only be carried out with the hardware component configurations and combinations that are expressly specified and with the software and firmware indicated and specified in the respective documentation and functional descriptions.

Typical areas of application of the operator displays are:

- Handling systems and assembly systems
- Packaging and food processing machines
- Printing machines and paper converting machines
- Machine tools
- Wood processing machines

The operator displays may only be operated under the mounting and installation conditions, the position, and the ambient conditions (temperature, degree of protection, humidity, EMC etc.) specified in this documentation.

NOTICE

Risk of destroying the touch screen or the front panel by using inappropriate items.

Operate the touch screen only with your finger or with a special touch pen (parts number 1070923266).

5 Spare Parts, Accessories and Wear Parts

5.1 Y-Repeater

Connecting unit to connect two operator displays featuring 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

Tab. 5-1: Y-Repeater

5.2 External 24 V Power Supply Unit

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

Tab. 5-2: External 24 V power supply unit for the operator display

5.3 Uninterruptible Power Supply (UPS)

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

Tab. 5-3: Uninterruptible power supply (UPS)

5.4 Connecting Cables for the CDI Interface



Malfunctions caused by using inappropriate CDI cables.
Use only cables listed in the following overview.

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

Ordering code	Part number	Description
RKB0008/010,0 (*****_*****_*****)	R911170153	Length 10 m
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

Tab. 5-4: Connecting cables to control cabinet PC, panel PC and operator display
Further cable lengths are available on request.



Two cables are always required to establish a connection between the VxB and the VDP.

5.5 Connecting Cables for the USB Interface

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
RKB0019/005,0 (*****_*****_*****)	R911171168	USB connecting cable, Length 5 m

Tab. 5-5: Connecting cables to the control cabinet PC

5.6 USB Cables with Increased Noise Immunity

NOTICE

If the UPS is used in noisy environment, malfunctions are possible.

Use only USB cables with high noise immunity for the connection between control cabinet PC and uninterruptible power supply (VAU 01.1 U) with communication interface.

Ordering code	Part number	Description
RKB0050/001,0	R911172944	USB connecting cable with increased noise immunity; length 1 m
RKB0050/003,0	R911172945	USB connecting cable with increased noise immunity; length 3 m

Tab. 5-6: Noise immune connecting cable control cabinet PC and UPS

5.7 Wear Parts

Wear parts are not subject to any warranty.

Backlight

The service life of the backlight is limited. After this time has been exceeded, the backlight will produce only 50 % of its original brightness. The service life is approx. 50,000 hours at an ambient temperature of 25 °C.

6 Ambient Conditions

	In operation	Transport	Storage
Max. ambient temperature	+5 °C to +45 °C	-20 °C to +60 °C	
Max. temperature gradient	Temporal temperature changes up to 3 K per minute		
Humidity	Min. relative humidity: 5 % Max. relative humidity: 85 % Min. absolute humidity: 1 g/m³ Max. absolute humidity: 25 g/m³ Condensation not allowed Corresponds to climatic class 3K3 acc. to EN 60721-3-3	Min. relative humidity: 5 % Max. relative humidity: 75 % Min. absolute humidity: 1 g/m³ Max. absolute humidity: 25 g/m³ Condensation not allowed Corresponds to climatic class 2K2 acc. to EN 60721-3-2	Min. relative humidity: 5 % Max. relative humidity: 85 % Min. absolute humidity: 1 g/m³ Max. absolute humidity: 25 g/m³ Condensation not allowed Corresponds to climatic class 1K2 acc. to EN 60721-3-1
Air pressure	Up to 3000 m above sea level acc. to EN 61131-2		

	In operation	Transport	Storage
Mechanical strength	Max. vibration: Frequency range: 10 Hz to 150 Hz Excursion: 0.075 mm at 10 Hz to 57 Hz Acceleration: 1 g at 57 Hz to 150 Hz acc. to EN 600068-2-6	Max. shock: 15 g 11 ms acc. to EN 60068-2-27, no disturbance of the function	Max. shock: 15 g 11 ms acc. to EN 60068-2-27, no disturbance of the function
Contamination level	2		
Overvoltage category	2	-	

Tab. 6-1: Ambient conditions

7 Technical Data

	VDP 16.3DB	VDP 16.3AK	VDP 16.3BK
Display	305 mm TFT (12"), 800 x 600 pixels, 16.7 million colors		
Operation	Touch screen operation		Key operation
Surface - front panel	Color RAL 7035 Light gray	Graphite gray (Bosch design)	Color RAL 7035 Light gray
Enclosure rating	Front panel IP 65 according to DIN EN 60 529 Front type 1 according to NEMA (UL) Rear panel IP 20		
Interface on the front panel	USB connection, Cover degree of protection IP 65	No USB	USB connection, Cover degree of protection IP 65
Voltage supply	DC 24 V (use a 24 V power supply unit according to DIN EN 60742, classification VDE 0551, for example the power supply unit VAP01.1H-W23-024-010-NN, part number R911171065)		
Current consumption	0.85 A		
Power loss	20 W		
USB	Per USB port max. 500 mA, total current at all USB ports is max. 1 A		
Weight	4.0 kg		

Tab. 7-1: Technical data of the VDP 16.3

	VDP 40.3DE	VDP 40.3BI	VDP 40.3DF
Display	381 mm TFT (15"), 1024 x 768 pixels, 16.7 million colors		
Surface – front panel	Color RAL 7035 Light gray		
Operation	Touch screen operation	Key operation	Touch screen and key operation
Enclosure rating	Front panel IP 65 according to DIN EN 60 529 Front type 1 according to NEMA (UL) Rear panel IP 20		
Interface on the front panel	USB port, cover, degree of protection IP 65		
Voltage supply	DC 24 V (use a 24 V power supply unit according to DIN EN 60742, classification VDE 0551, for example the power supply unit VAP01.1H-W23-024-010-NN, part number R911171065)		
Current consumption	1.05 A		
Power loss	25 W		
USB	Per USB port max. 500 mA, total current at all USB ports is max. 1 A		
Weight	5.8 kg		

Tab. 7-2: Technical data of the VDP 40.3 (DE, BI, DF)

	VDP 40.3DI	VDP 40.3AL
Display	381 mm TFT (15"), 1024 x 768 pixels, 16.7 million colors	
Surface – front panel	Color RAL 7035 Light gray	Graphite gray Bosch Design
Operation	Touch screen operation and switching elements	Touch screen operation
Enclosure rating	Front panel IP 65 according to DIN EN 60 529 Front type 1 according to NEMA (UL) Rear panel IP 20	
Interface on the front panel	USB port, cover, degree of protection IP 65	No USB
Voltage supply	DC 24 V (use a 24 V power supply unit according to DIN EN 60742, classification VDE 0551, for example the power supply unit VAP01.1H-W23-024-010-NN, part number R911171065)	
Current consumption	1.05 A	
Power loss	25 W	

	VDP 40.3DI	VDP 40.3AL
USB	Per USB port max. 500 mA, total current at all USB ports is max. 1 A	
Weight	5.8 kg	

Tab. 7-3: Technical data of the VDP 40.3 (DI, AL)

	VDP 60.3FE
Display	483 mm TFT (19"), 1280 x 1024 pixels, 16.7 million colors
Operation	Touch screen operation
Surface – front panel	Color RAL 7035, light gray
Enclosure rating	Front panel IP 65 according to DIN EN 60 529 Front type 1 according to NEMA (UL) Rear panel IP 20
Interface on the front panel	USB connection (front panel) Cover degree of protection IP 65
Voltage supply	DC 24 V (use a 24 V power supply unit according to DIN EN 60742, classification VDE 0551, for example the power supply unit VAP01.1H-W23-024-010-NN, part number R911171065)
Current consumption	1.7 A
Power loss	40 W
USB	Per USB port max. 500 mA, total current at all USB ports is max. 1 A
Weight	7.3 kg

Tab. 7-4: Technical data of the VDP 60.3

8 Standards

8.1 Used Standards

Standard	Meaning
EN 60,204 -1	Safety of machinery - Electrical equipment of machines
EN 61,000-6-4	Generic standards - emission standard (industrial environments)
EN 61,000-6-2	Generic standards – noise immunity (industrial environments)
EN 61,558-2-6	Transformer for 24 V power supply unit, protective separation
EN 60,664 -1	Overvoltage category II
EN 61,131 -2	24 V outputs requirements
EN 61,131 -2	24 V current supply requirements
ISO 13,850	Safety of machinery, EMERGENCY STOP devices
EN 60 529	Degrees of protection (including housings and installation compartments)

Standard	Meaning
EN 60,068-2-6	Vibration test
EN 60,068-2-27	Shock test
EN 60 721-3-1 and EN 60,721-3-3	Climatic class

Tab. 8-1: Used Standards

8.2 CE Marking

8.2.1 Declaration of Conformity



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

EMC Directive 2004/108/EC

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

Standard	Title	Edition
DIN EN 61000-6-4 (VDE 0839-6-4)	Electromagnetic Compatibility (EMC) Part: 6-4: Generic standards – emission standard for industrial environments (IEC 61000-6-4:2006)	September 2007
DIN EN 61000-6-2 (VDE 0839-6-2)	Electromagnetic Compatibility (EMC) Part: 6-2: Generic standards – noise immunity for industrial environments (IEC 61000-6-2:2005)	March 2006

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



Non-compliance with CE conformity due to modifications to the device.

The CE marking is only valid for the device in its delivery status. After having modified the device, the CE conformity is to be verified.

8.3 UL/CSA Certified



The devices are certified according to

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

UL file no. E210730

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



Loss of UL/CSA conformity due to modifications to the device.

The UL and CSA marking is only valid for the device in its delivery status. After modifying the device, the UL and CSA conformity is to be verified.

9 Interfaces

9.1 View

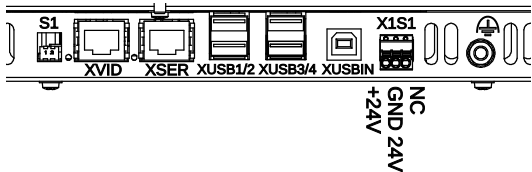


Fig. 9-1: Interfaces on the operating display

9.2 Overview

Designation at the housing	Connection type	Connector type, integrated	Mating connector or cable (from outside)
X1S1	DC-24-V voltage supply	3-pin, MC1,5/3-G-3,5THT	3-pin, FK-MCP 1,5/3-ST-3,5
XUSB1/2	2 USB interfaces	USB female connector, Type A	USB connector, Type A
XUSB3/4	2 USB interfaces	USB female connector, Type A	USB connector, Type A
XSER	CDI interface, data	RJ45 female connector	RJ45 connector
XVID	CDI interface, screen	RJ45 female connector	RJ45 connector

Designation at the housing	Connection type	Connector type, integrated	Mating connector or cable (from outside)
XUSBIN	USB2.0 connection to the control cabinet PC. Length 5 m max. Use only a high-speed USB2.0 cable (see chapter 5 "Spare Parts, Accessories and Wear Parts" on page 6)	USB female connector, Type B	USB connector, Type B
	Functional earth ground (FE)	M5	Ring cable lug

Tab. 9-1: Interfaces

NOTICE

Malfunctions due to insufficient shielding!
Use only shielded cables and metallic or conductive connector/coupling covers with large-area shield support.

9.3 DC 24 V Voltage Supply

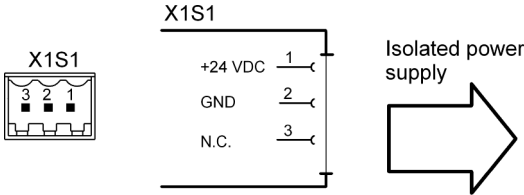


Fig. 9-2: Interface for 24 V voltage supply

Pin	Function
1	Supply voltage +24 V
2	Supply voltage 0 V
3	n. c.

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


For wiring connection terminals use copper wire only.

9.4 S1 DIP Switch

9.4.1 Overview

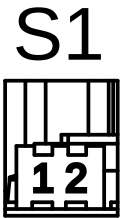


Fig. 9-3: S1 DIP switch on the connector panel of the operating display

Designation at the housing	Switch type	Function
S1/1	DIP switch	No function
S1/2	DIP switch	OFF: Cable length to the control cabinet PC $\leq$ 30 m ON: Cable length to the control cabinet PC $>$ 30 m

Tab. 9-2: DIP switch at the VDP

9.5 USB Interfaces

The devices feature four USB interfaces on the connector panel (XUSB1/2 and XUSB3/4), and, depending on the version, one interface on the front panel.

Operation of the USB ports on the operating display

The USB speed at the operating display depends on the cable length of the XSER connection and of the DIP switch setting, see [tab. 9-3 "USB speeds depending on the XSER cable length" on page 15](#):

Cable length of the XSER connection	DIP switch S1/2	USB speed	Note
Up to 5 meters	OFF	12 Mb/s	-
Up to 5 meters	OFF	480 Mb/s (USB2.0)	An additional USB cable between control cabinet PC and XUSBIN is required
From 5 to 30 meters	OFF	12 Mb/s	Make sure that the connected device does not contain a USB hub
Longer than 30 meters	ON	12 Mb/s	Hubs (USB hubs) are not supported

Tab. 9-3: USB speeds depending on the XSER cable length



Interference-free USB2.0 connection is possible up to a cable length of 5 meters only.



Connect only USB devices that meet the USB specification.

NOTICE

The VDP power supply switches off if the total current of all USB connectors exceeds 1 A.

The max. power consumption of one USB connector must not exceed 500 mA.
The total current of all USB female connectors must not exceed 1 A.

9.6 XSER Interfaces and XVID Interfaces

CDI interface

The CDI interface is assigned to the two RJ45 female connectors XSER and XVID. The connection between the control cabinet PC and the operating display is established on these female connectors via two ready-made cables available as accessory, see [chapter 5 "Spare Parts, Accessories and Wear Parts" on page 6](#).

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

XVID and XSER Markings

The CDI interfaces are color-coded on the device:

CDI interface, data (XSER)	Violet
CDI interface, screen (XVID)	Black

Tab. 9-4: Color-coding of the interface

10 Assembly, Disassembly and Electrical Installation

10.1 Installation Notes

- Provide a space of 50 mm on all sides of the device for sufficient cooling and cable routing
- The LED displays on the connector must not be covered
- Lay all cable in loops. Use strain reliefs for all cables
- Keep as much distance as possible to noise sources
- Only install the operating display vertically, with a max. deviation of $\pm 45^\circ$, measured from the vertical
- Do not lay the CDI cables in parallel to motor cables or to other noise sources as otherwise the CDI connection may be disturbed

10.2 Housing Dimensions

10.2.1 IndraControl VDP 16.3

VDP 16.3 standard version

Irrespective of the design of the VDP 16.3 standard variants with keys (M-keys) or touch screen the front panel width is 350 mm and the height is 290 mm. All values in the illustrations are given in mm.

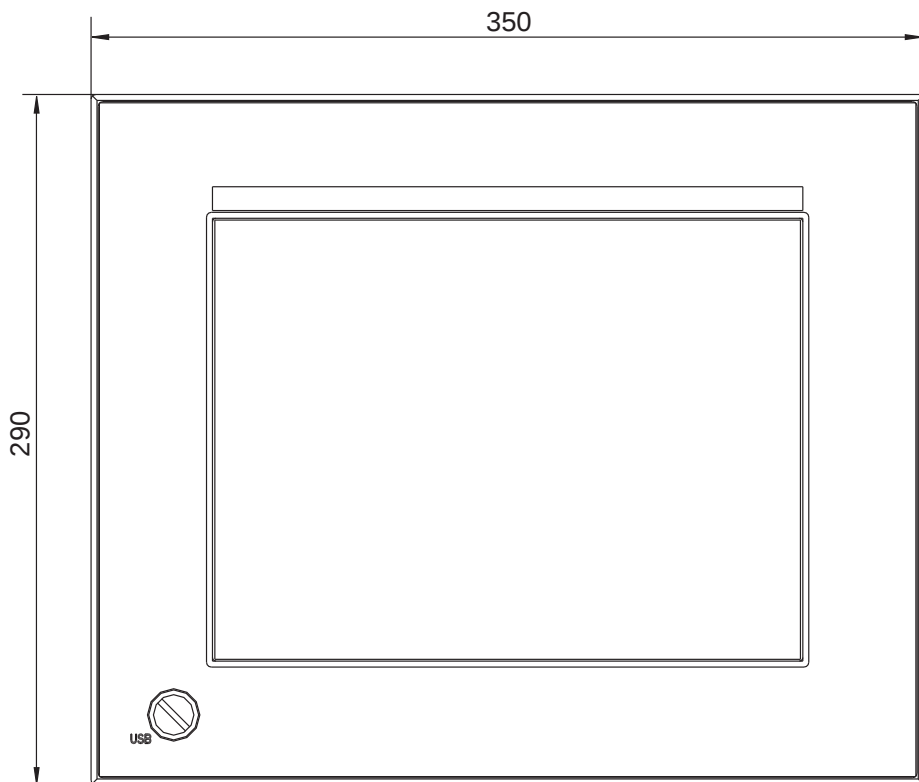


Fig. 10-1: Dimensions: Front panel of the VDP 16.3DB

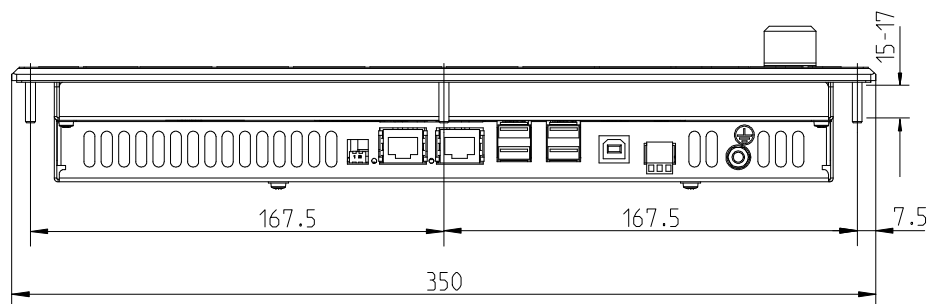


Fig. 10-2: VDP 16.3BK: Top View

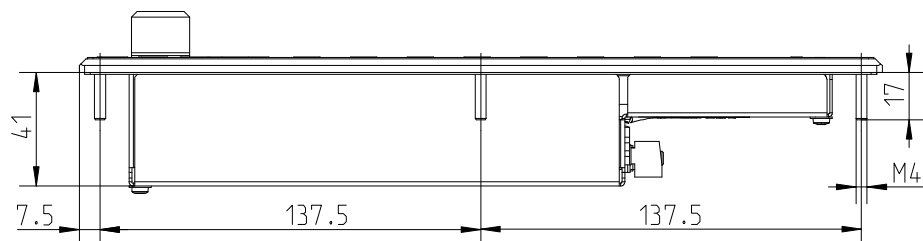


Fig. 10-3: VDP 16.3BK: Left view

VDP 16.3AK customized version

The front panel width of the VDP 16.3AK is 360 mm and the height is 300 mm. It has no USB connection.

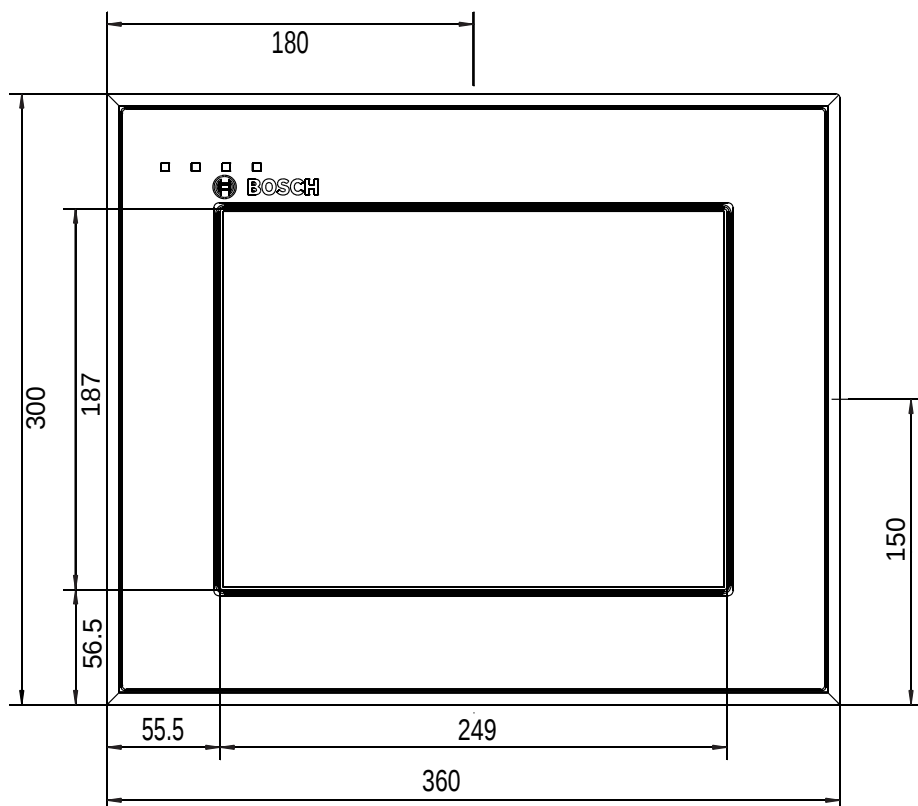


Fig. 10-4: Dimensions: Front panel of the VDP 16.3AK

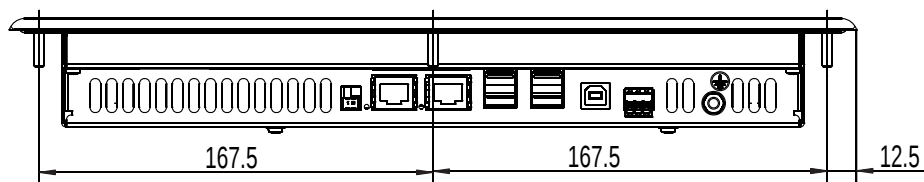


Fig. 10-5: VDP 16.3AK: Top View

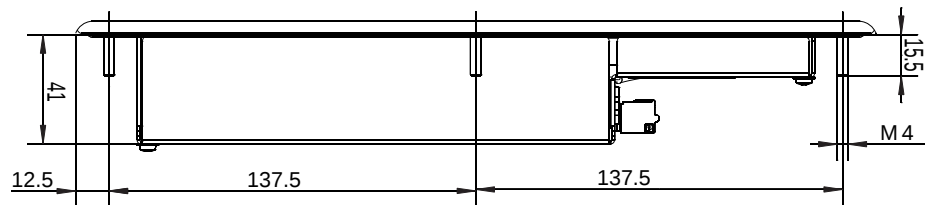


Fig. 10-6: VDP 16.3AK: Left view

	VDP 16.3BK + DB	VDP 16.3AK
Width	350 mm	360 mm
Height	290 mm	300 mm
Mounting depth	41 mm	

Tab. 10-1: Dimensions of the VDP 16.3 devices

10.2.2 IndraControl VDP 40.3

VDP 40.3 standard version

Irrespective of the design of the VDP 40.3 standard variants with keys (M-keys) or touch screen the front panel width is 407 mm and the height is 370 mm. All values in the illustrations are given in mm.

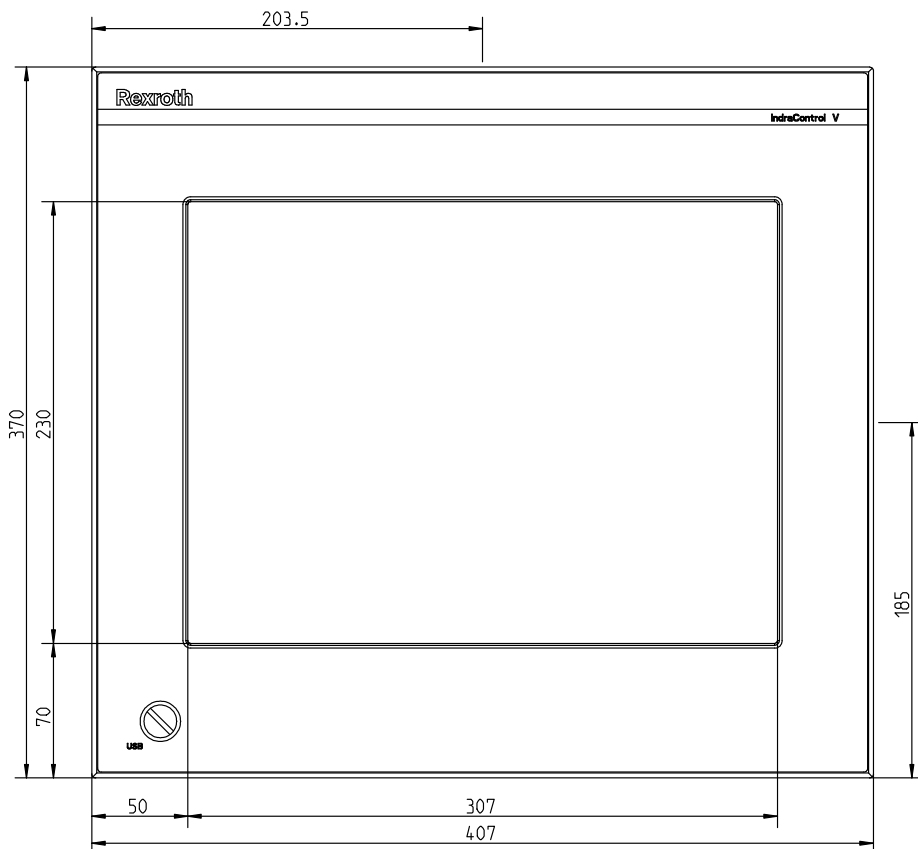


Fig. 10-7: Dimensions: Front panel of the VDP 40.3BI devices

The front panels of the VDP 40.2DE, -BI, -DF and VDP 40.3DG have the same dimensions.

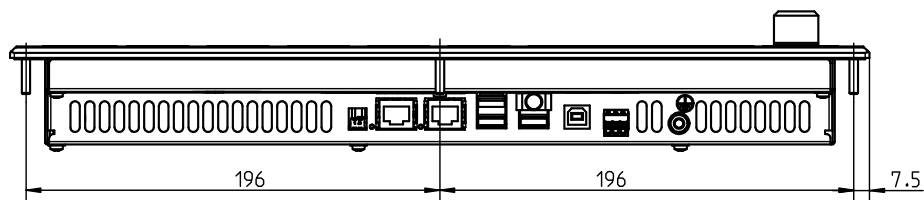


Fig. 10-8: VDP 40.3BI and VDP 40.3DE: Top View

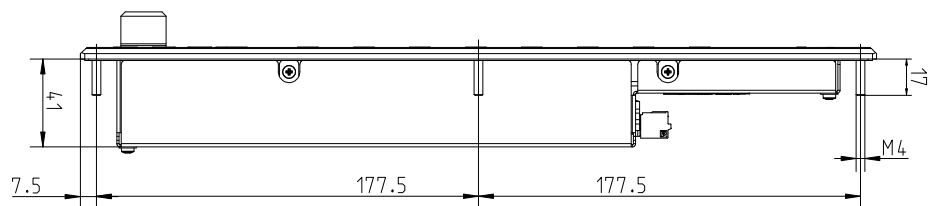


Fig. 10-9: VDP 40.3BI and VDP 40.3DE: Left view

VDP 40.3AL customized version

The front panel width of the VDP 40.3AL is 417 mm and the height is 380 mm. It has no USB connection.

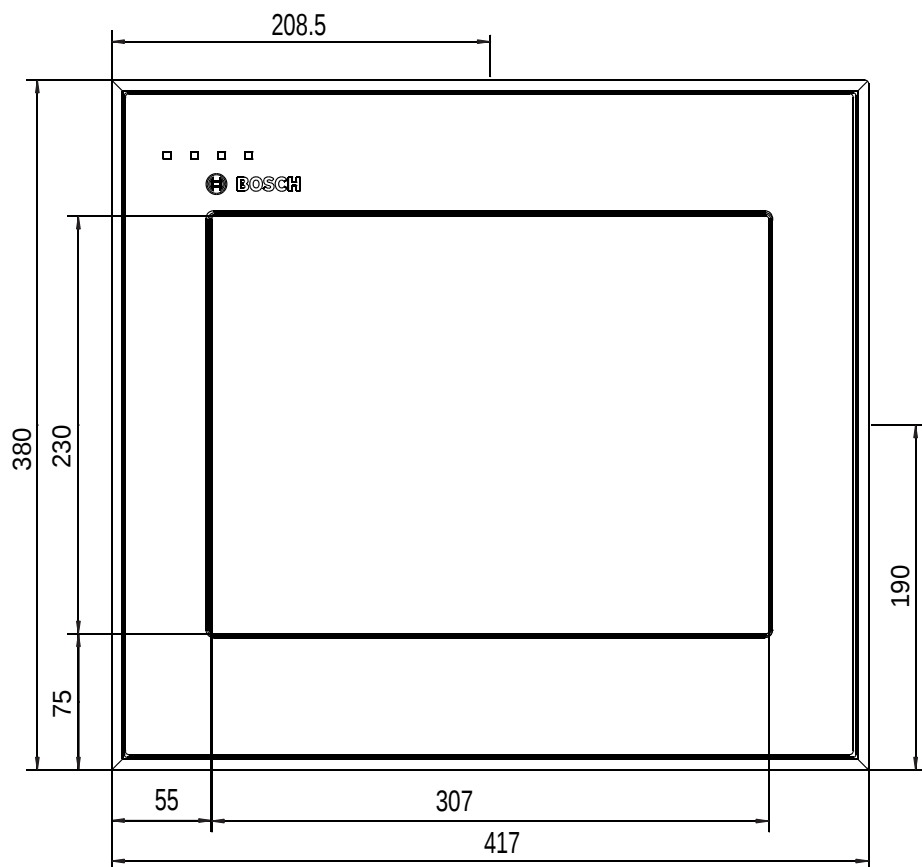


Fig. 10-10: Dimensions: Front panel of the VDP 40.3AL devices

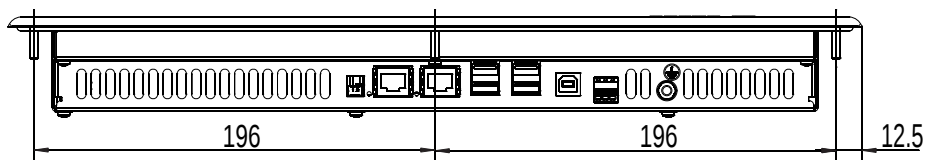


Fig. 10-11: VDP 40.3AL: Top View

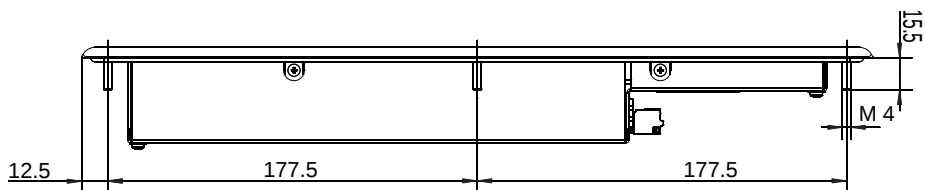


Fig. 10-12: VDP 40.3AL: Left view

	VDP 40.3DE + BI + DF +DG	VDP 40.3AL
Width	407 mm	417 mm
Height	370 mm	380 mm
Mounting depth	41 mm	

Tab. 10-2: Dimensions of the VDP 40.3 devices

10.2.3 IndraControl VDP 60.3

VDP 60.3 standard version

Irrespective of the design of the VDP 60.3 devices with keys (M-keys) or touch screen the front panel width is 483 mm and the height is 400 mm. All values are given in mm.

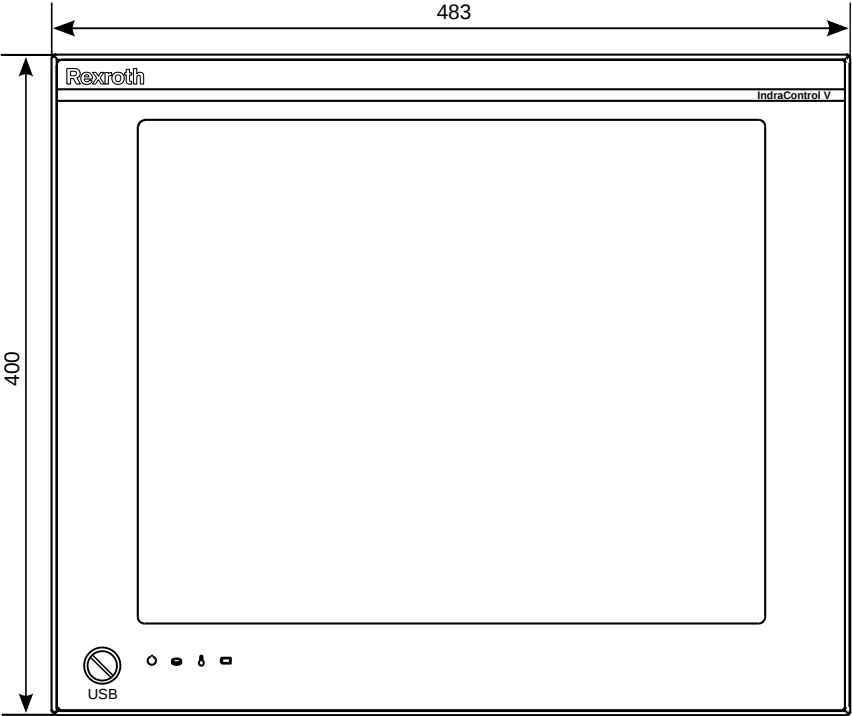


Fig. 10-13: Dimensions: Front panel of the VDP 60.3

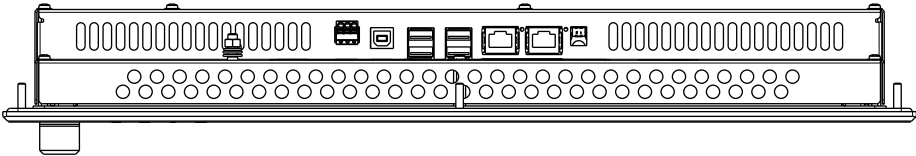


Fig. 10-14: VDP 60.3: Top View

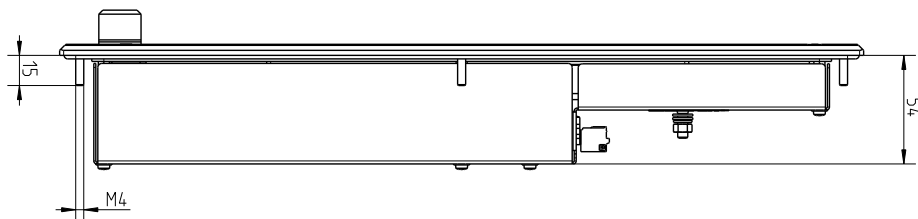


Fig. 10-15: VDP 60.3: Left view

10.3 Mounting Cut-out

Mount the operating display as follows:



Loss of degree of protection IP 65!

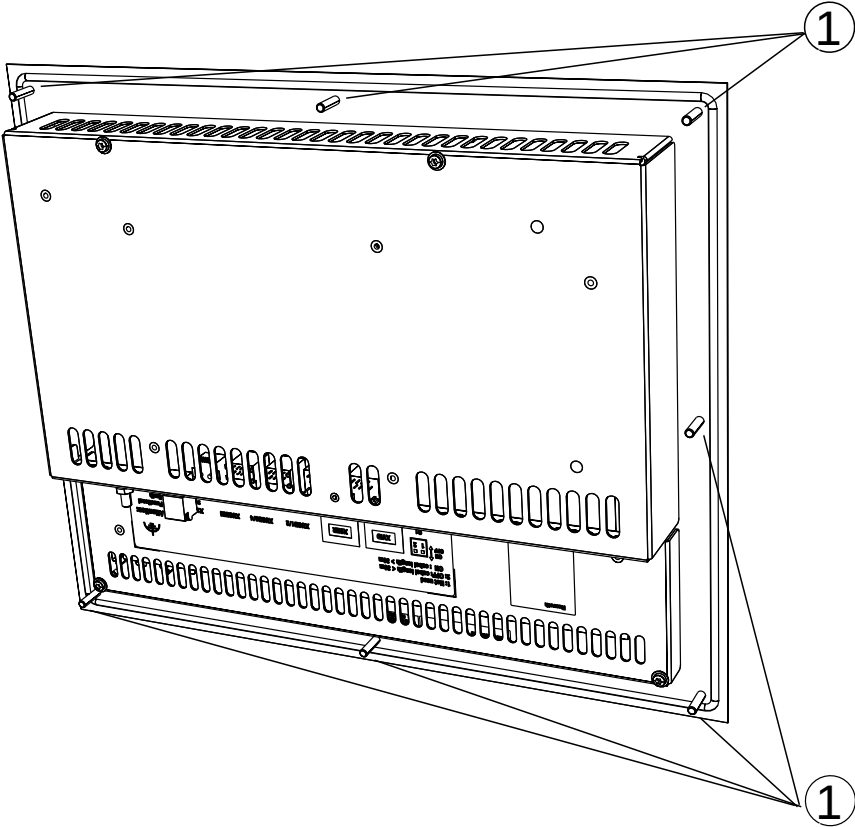
The housing in which the operator display is installed, has to fulfil the following conditions:

- free from impurities
- sufficient mechanical strength and flatness

These criteria influence the required degree of protection IP to a great extent.

Further required measures are to be taken depending on the mounting location, e. g. the stabilization of the mounting frame.

1. Create a mounting cut-out with 8 holes, diameter 5 mm, according to the illustrations "Mounting dimensions" on the following pages.
2. Remove the paper strip from the seal on the rear side of the front panel.
3. Insert the operator display from the front into the cut-out. The mounting bolts M4 are inserted into the drilled holes, see [fig. 10-16 "Position of the mounting bolts" on page 26](#).
4. Fasten the display by screwing the nuts at the rear side of the mounting bolts, see [fig. 10-16 "Position of the mounting bolts" on page 26](#).



① Mounting bolt

Fig. 10-16: Position of the mounting bolts

NOTICE

Damage of the mechanics caused by wrong tightening torque.

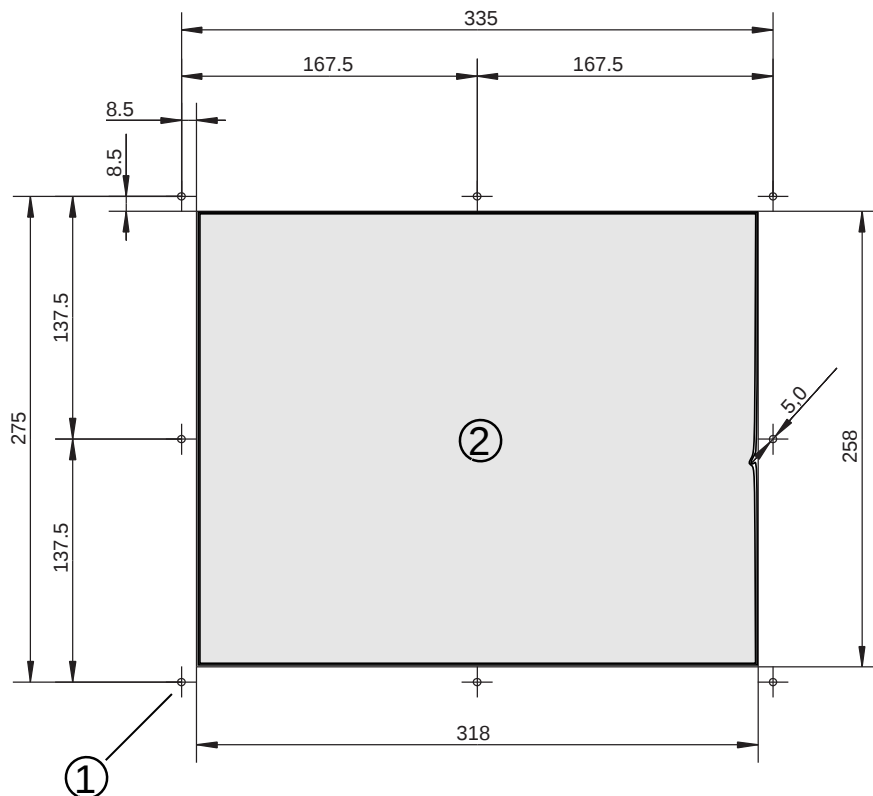
Tighten the screws and nuts with the corresponding torque according to the following table.

Threads	Mounting torques
M2.5	0.4 Nm
M3	0.7 Nm

Threads	Mounting torques
M4	1.4 Nm
M5	2.8 Nm

Tab. 10-3: Mounting torques

10.4 Mounting Dimensions VDP 16.3



① Drilled hole for the mounting bolts, bore diameter 5 mm

② Mounting cut-out

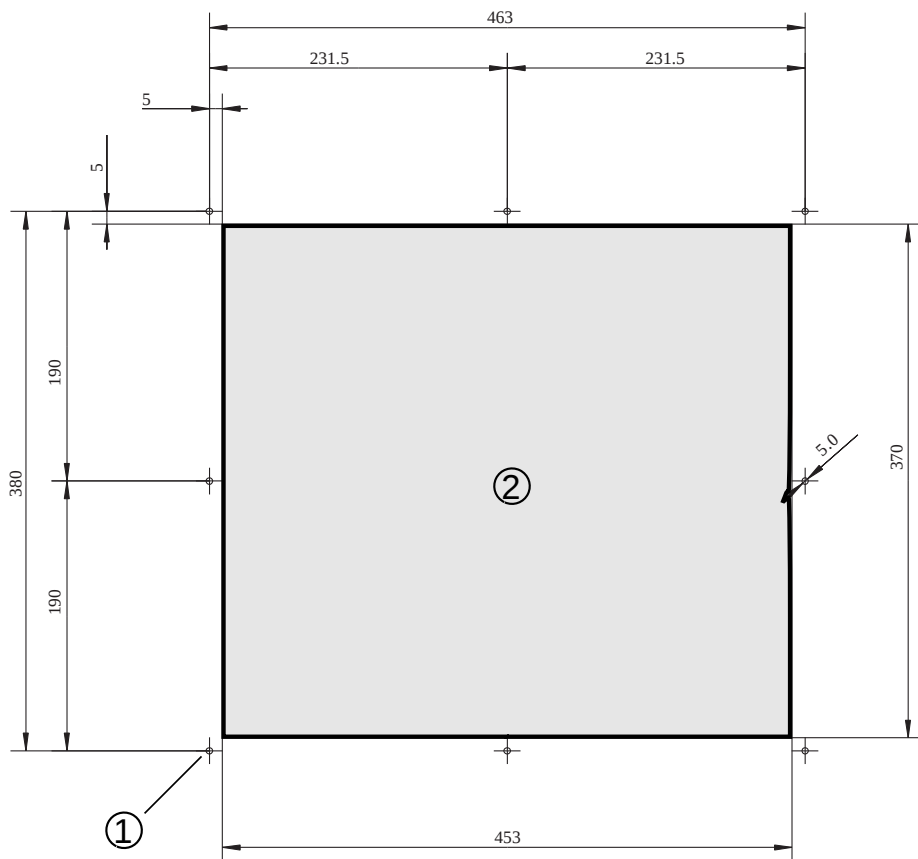
Fig. 10-17: Mounting dimensions of the VDP 16.3 devices (in millimetres)

- ① Drilled hole for the mounting bolts, bore diameter 5 mm
- ② Mounting cut-out

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10.6 Mounting Dimensions VDP 60.3



① Drilled hole for the mounting bolts, bore diameter 5 mm

② Mounting cut-out

Fig. 10-19: Mounting dimensions of the VDP 60.3 devices (in millimetres)

10.7 Disassembly

1. Disconnect the operating display
2. Remove all connected cables
3. Remove all nuts from the mounting bolts
4. Carefully press out the operator display from the mounting cut-out, moving it from the back to the front

10.8.1 Wiring

Wiring 230 V



High electrical voltage! Danger to life and risk of injury caused by electric shock or bodily harm caused by supply voltage on the protective extra-low voltage (e.g. +24 V)!

Power supply units, whose net connection is designed for overvoltage category II, are to be connected to a net voltage with overvoltage category II (see [fig. 10-20 "Wiring 230 V" on page 30](#)).

⚠ DANGER

Danger to life and risk of injury caused by connection of power supply units, which cause protective extra-low voltage (e.g. +24 V), to supply voltages, for which they are not designed.

Power supply units, whose net connection is designed for overvoltage category II, are to be connected to a net voltage with overvoltage category II (see [fig. 10-20 "Wiring 230 V" on page 30](#)).

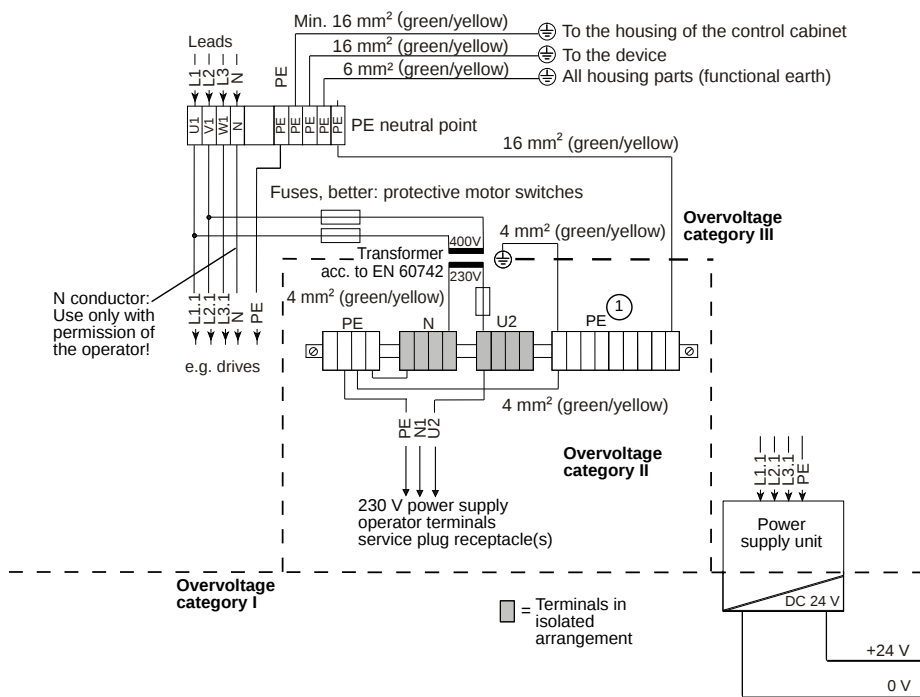
Wiring 400 V

Fig. 10-21: Wiring 400 V

⚠ DANGER

High electrical voltage! Danger to life and risk of injury caused by electric shock or bodily harm caused by supply voltage on the protective extra-low voltage (e.g. +24 V)!

Power supply units, whose net connection is designed for overvoltage category III, can be connected to a net voltage with overvoltage category II or overvoltage category III, (see [fig. 10-21 "Wiring 400 V" on page 31](#)).

⚠ DANGER

Danger to life and risk of injury caused by connection of power supply units, which cause protective extra-low voltage (e.g. +24 V), to supply voltages, for which they are not designed.

Power supply units, whose net connection is designed for overvoltage category III, can be connected to a net voltage with overvoltage category II or overvoltage category III, (see [fig. 10-21 "Wiring 400 V" on page 31](#)).

NOTICE

Material damages to electronics due to missing functional earth ground connection!

Ensure that the functional earth ground is connected, as otherwise the electronics can be destroyed by a potential difference between the VDP xx.3 and the PC if the voltage supply is interrupted to only one device and re-established. A direct connection of the functional earth ground between the VDP xx.3 display and control cabinet PC is optimal. If the functional earth ground is connected to a neutral point, the control cabinet PC has to be connected to this neutral point.

Control cabinet PC and display to UPS

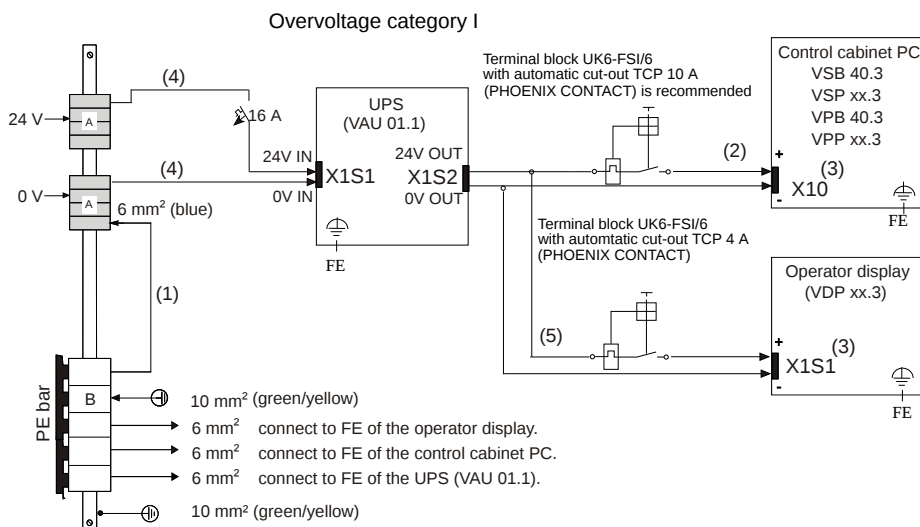


Fig. 10-22: Control cabinet PC and display (VDP xx.3) connected to a UPS

Only control cabinet PC connected to UPS

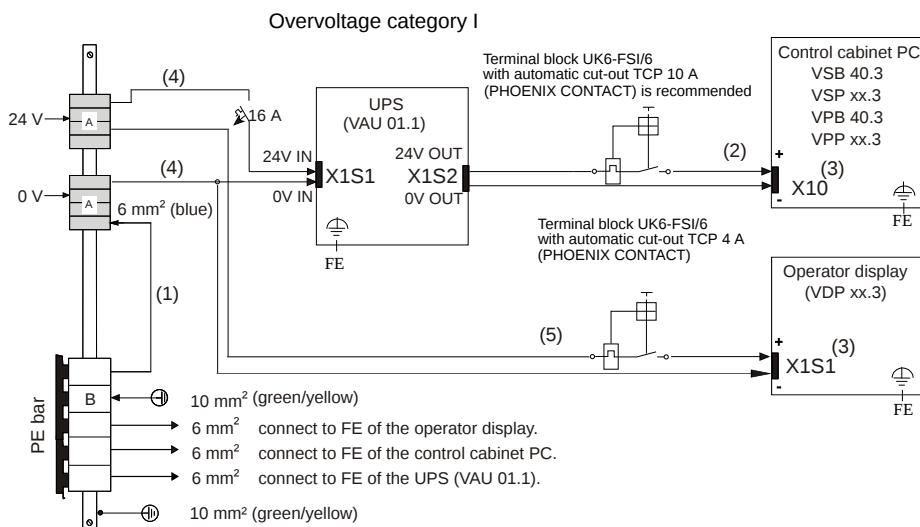


Fig. 10-23: Control cabinet PC connected to a UPS. Display (VDP xx.3) not connected to an UPS

10.8.2 Connecting the Control Cabinet PC to Operating Display

Connection diagram

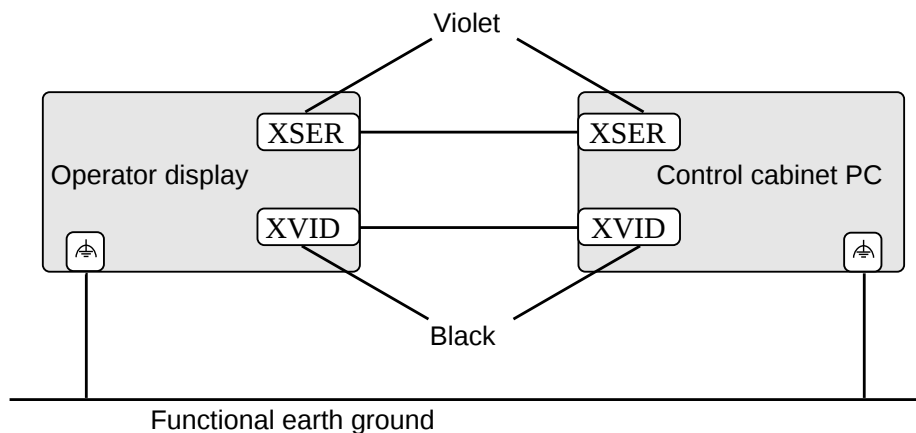


Fig. 10-24: Wiring the operating display to the control cabinet PC

Connection

1. Connect the functional earth ground.



2. Connect the violet RJ45 data interface "XSER" at the operating display to the RJ45 data interface "XSER" at the control cabinet PC.
3. Connect the black RJ45 image data interface "XVID" at the operating display to the RJ45 image data interface "XVID" at the control cabinet PC.

NOTICE

Material damages to electronics due to missing functional earth ground connection!

Ensure that the functional earth ground is connected, as otherwise the electronics can be destroyed by a potential difference between the VDP and the PC if the voltage supply is interrupted to only one device and re-established. A direct connection of the functional earth ground between the VDP xx.3 display and control cabinet PC is optimal. If the functional earth ground is connected to a neutral point, the control cabinet PC has to be connected to this neutral point.



When installing CDI cables with a diameter of 7.4 mm observe the bending radius:

- Radius (when bended once during installation): $4 \times$ cable diameter
- Minimum bending radius (when moved permanently): $8 \times$ cable diameter
- Optimum bending radius (when moved permanently): $12.5 \times$ cable diameter



Breakdown of the operation due to mechanical forces which impact the CDI cables.

Avoid mechanical stress (tensile, compressive, torsional and lateral forces) caused by connectors to the RJ45 female connector.



Breakdown of the operation due to changed CDI cables.

To be able to clearly identify the cables, label the cables, e.g. with a cable marker or clips.



The maximum cable length depends on the display resolution:

- Up to 60 meters: 1280×1024 pixels (only VDP 60.3)
- Up to 70 meters: 1024×768 pixels (only VDP 40.3 and VDP 60.3)
- Up to 80 meters: 800×600 pixels (all VDPxx.3)

Longer cable lengths can be realized using the Y-Repeater (see [chapter 12.4 "Y-Repeater" on page 41](#)).



Screen output interference due to VDP device exchange during running operation if the resolution of the exchanged device is different.

The display resolution is detected only once after switching on the control cabinet PC. Consequently, if a VDP is plugged and then removed or if a VDP is connected when starting the control cabinet PC, only a VDP with the same resolution can be connected again. Thus, it is ensured that the screen output on the connected and disconnected VDP is executed automatically without switching the screen output to the VDP using the keyboard.



Malfunctions caused by using inappropriate cables.

Use only cables listed in [chapter 5 "Spare Parts, Accessories and Wear Parts" on page 6](#).

10.8.3 Connecting the Operating Display to the 24 V Voltage Supply

Connection diagram

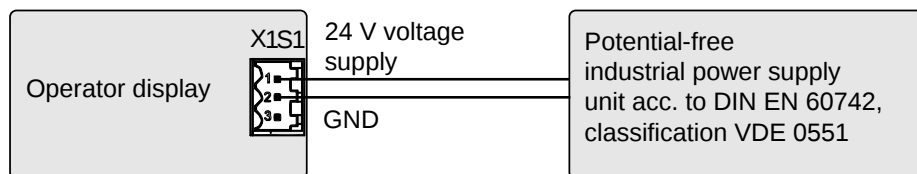


Fig. 10-25: Wiring the operating display to the control cabinet PC

Connection

1. Connect the "X1S1" interface for the 24 V voltage supply to the industrial power supply unit.

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



For wiring connection terminals use copper wire only.

NOTICE

If the distance between VDP and control cabinet PC exceeds 50 m, equalizing currents may flow when using a non-isolated power supply unit as pin 2 is internally connected to the housing.

In this case an isolated power supply unit has to be used.

UPS



The display immediately darkens in the event of a power failure if the operating display has been connected directly to the 24 V supply voltage without using a UPS. The user cannot execute any actions via the operating display during the shutdown of the control cabinet PC.

If the operating display is connected together with the control cabinet PC to the "24 V Out" of the external UPS, the user still can access the operating display during the shutdown in the event of a power failure.

10.8.4 Connection Scheme – Power Supply Unit, UPS, Control Cabinet PC and Operating Display

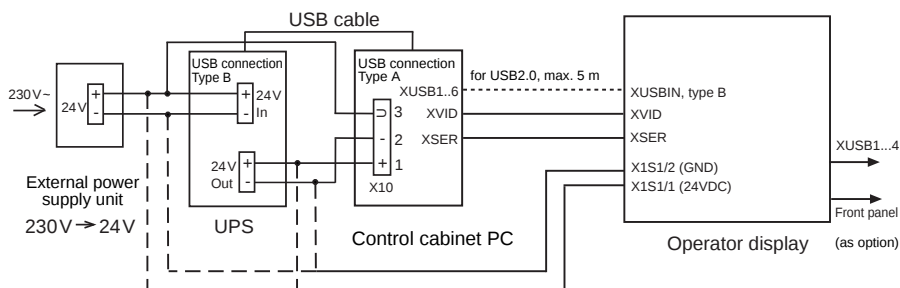


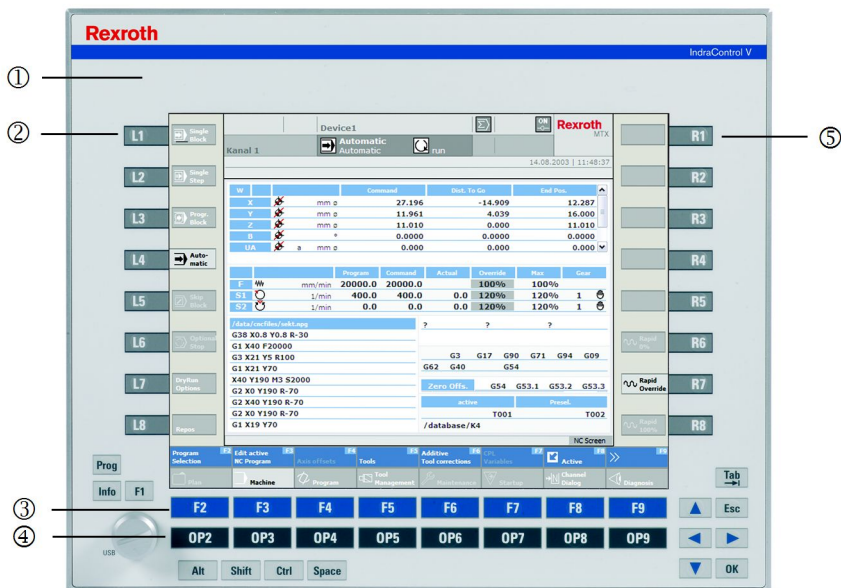
Fig. 10-26: Connection scheme – power supply unit, UPS, control cabinet PC and operating display

11 Commissioning

The product can be used directly, no configuration is required.

12 Device Description

12.1 General Information



- ① Status displays
- ② Machine function keys (M-keys) L1 to L8
- ③ Function keys F2 to F9
- ④ Operating keys OP2 to OP9
- ⑤ M-keys R1 to R8

Fig. 12-1: Position of the keys and status displays; example VDP 40.3DF

12.2 Membrane Keyboard

12.2.1 System Requirements

For the language-independent membrane keyboard no language-dependent keyboard driver is to be installed. The preinstalled English keyboard driver can be used also for user interface of other languages. Therefore, do not change the delivery settings.

If you want to operate an external USB keyboard (e.g. VAK), the adequate keyboard driver has to be selected.

12.2.2 VDP 16.3 Keys and VDP 40.3 Keys

Function and operating keys (F... + OP...)

The assignment of the function and operating keys (F... + OP...) is determined by the respective application software.

OP-Keys

The following key codes are transmitted to the operating system:

Key at the VDP 16.3, VDP 40.3	Key code
OP2	<CTRL> + <SHIFT> + <ALT> + <F2>
to	
OP9	<CTRL> + <SHIFT> + <ALT> + <F9>
Prog	<CTRL> + <SHIFT> + <ALT> + <Q>
INFO	<CTRL> + <SHIFT> + <ALT> + <I>

Tab. 12-1: Key code for the VDP 16.3 and VDP 40.3

M-Keys

Eight M-keys (machine function keys) are positioned to the right and to the left of the display. The keys on the right side of the display are labeled with R1 to R8, the keys on the left side of the display with L1 to L8.

Addressing of the M-keys

The state of the M-keys can be read out in different ways:

- Pressed M-keys are transmitted as USB keyboard signals to the PC
- The M-keys are transferred bit-coded to the control cabinet PC via the serial connection of the CDI interface. There, they can be output via a Profibus-DP slave card. They are also provided at a connector strip to pass on the signals to the corresponding extension card. The transmission protocol is ensured by means of the hardware. If there are interferences or if the connection is interrupted, the incoming M-key bits are disabled after 10 ms

Requesting M-keys via Windows applications

The following key codes are transmitted to the operating system:

Key at the VDP 16.3, VDP 40.3	Key codes if UpperClassFilter is activated	Key codes if UpperClassFilter is deactivated
L1 to L8	<CTRL> + <ALT> + <SHIFT LEFT> + <1 to 8> (not on numeric block)	<F13> to <F20>
R1 to R8	<CTRL> + <ALT> + <SHIFT RIGHT> + <1 to 8> (not on numeric block)	<F21> to <F24> and four OEM special characters

Tab. 12-2: Shortcuts for the keys of the VDP 16.3 and VDP 40.3 devices



If a USB special keyboard is used, the incoming keyboard data stream is analyzed and if a M-key code is detected (F13-F24 or four OEM special characters) the corresponding Ctrl-LRShift-Alt-<n> code is inserted into the data stream.

M-key output via Profibus DP

The M-keys can be output in the PC via an optional PCI plug-in board. The corresponding GSD file is supplied with the application. Pressed M-keys have the value "1", keys not pressed have the value "0".

Byte 1								Byte 0							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
R8	R7	R6	R5	R4	R3	R2	R1	L8	L7	L6	L5	L4	L3	L2	L1

Tab. 12-3: M-key assignment at the Profibus DP

12.3 Operating and Error Displays

There are four LEDs as on the top of the front panel to display the device conditions and errors of the connected control cabinet PC. Take one of the following measures if one of the succeeding LEDs displays an error or a note.

Symbol, LED	Display	Meaning	Measure
 Power	LED green	Normal operation With Y-repeater: This VDP is the active VDP	-
	LED off	No supply voltage DC 24 V	Check supply voltage
	LED is flashing green	No serial connection to the control cabinet PC	Check cables
		With Y-repeater: This VDP is not the active VDP	No action

Symbol, LED	Display	Meaning	Measure
 HDD	LED yellow	Hard disk access	-
	LED flashes yellow	Warning: SMART analysis identifies errors	Exchange hard disk
 Temp	LED off	Temperature in safe range	-
	LED flashes red	Fan in control cabinet does not run or runs too slow	Check the fan in the control cabinet PC
	LED red	Temperature > 50 °C	Reduce surrounding air temperature!
 UPS	LED off	Normal operation	-
	LED red	The control cabinet PC is currently operating in the UPS mode. I.e., the supply voltage is not available!	Restore supply voltage, initiate controlled restart of the control cabinet PC!

Tab. 12-4: LEDs for operating and error display on the front panel



Depending on the connected control cabinet PC, not all LEDs are activated. Therefore not all warnings and messages are displayed.

For further information, please refer to the relevant documentation of the control cabinet PC.

12.4 Y-Repeater

Two operator displays can be connected to one control cabinet PC using a Y-repeater. It cascades up to four operator displays. For more information about the Y-Repeater, refer to the operating instructions "Rexroth IndraControl VAC 01 Y-Repeater" (see [tab. 1-1 "Required and supplementing documentation" on page 2](#)).

13 Error Causes and Elimination

The error display on the front panel is described in [chapter 12.3 "Operating and Error Displays" on page 40](#).

Error	Correction
No image visible	- Connect the supply voltage, check the X1S1 connection - Connect the CDI cable correctly, check XVID and XSER - Set the screen output in the graphics driver to "VDP" - Switch on the voltage at the VDP before or at the same time as the control cabinet PC
Wrong display resolution	- Set the correct display resolution in the graphics driver - Restart the control cabinet PC

The USB flash drive does not function, although other USB devices function	• Set the DIP switch on the VDP to <30 m
USB devices and touch screen do not work	• Set the DIP switch adequately to the cable length
Touch screen functionality is not available	• Recalibrate the touch screen

Tab. 13-1: Error causes and error elimination

14 Maintenance

14.1 General Information

NOTICE

Loss of IP degree of protection due to incorrect maintenance.

The IP degree of protection must be ensured during maintenance!

14.2 Tightening torques

NOTICE

Damage of the mechanics caused by wrong tightening torque.

If screws were removed because of maintenance works, fasten them again with the corresponding torque according to the following table.

Threads	Mounting torques
M2.5	0.4 Nm
M3	0.7 Nm
M4	1.4 Nm
M5	2.8 Nm

Tab. 14-1: Mounting torques

14.3 Display

14.3.1 General Information

The backlight is subject to wear, see [chapter 5.7 "Wear Parts" on page 8](#).

A fading backlight causes a progressive deterioration display readability, so that a replacement is necessary. For further information please contact the Bosch Rexroth Service.

14.3.2 Backlight Switch-Off

To extend the service life of the LCD backlight, the flat screen display is provided with a backlight switch-off. This function "darkens" the display when the panel PC has been not operated for a certain period of time. The length of the time interval can be specified in the Windows Control Panel under "Power Options".

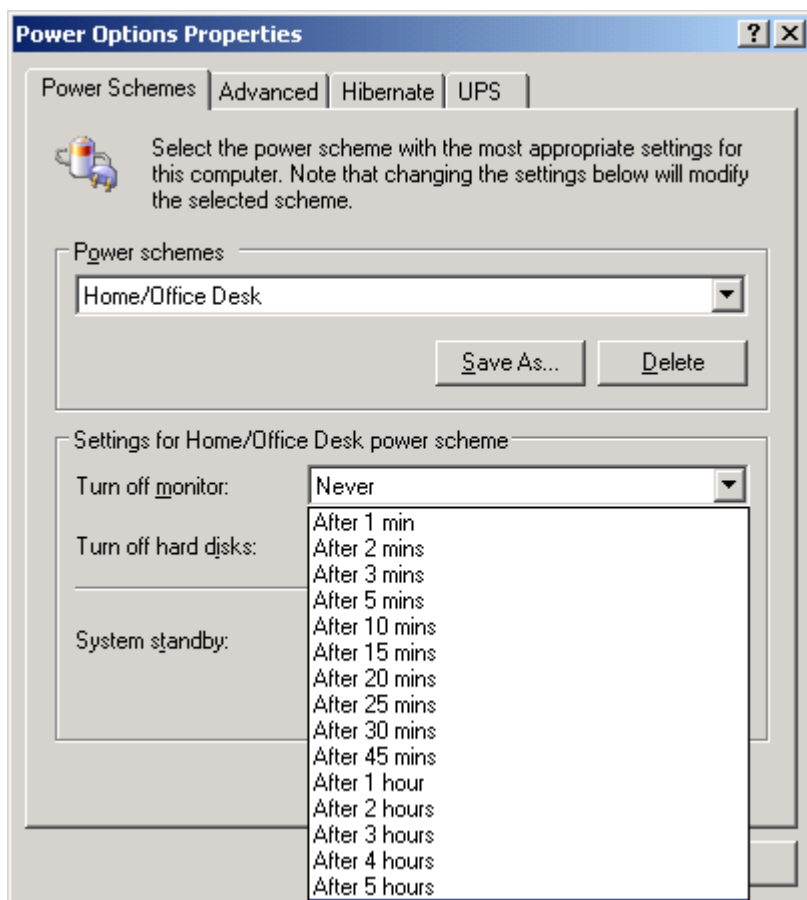


Fig. 14-1: Example: Setting the darkening mode of the display in the Windows XP Control Panel

14.4 Cleaning Notes

NOTICE

The surface of the membrane as well as the display seal are dissolved by solvents!

- Do not use any solvents (e. g. diluents)!
- No high pressure cleaning devices are to be used!

14.5 Regular Maintenance Tasks

- At least once a year, all plug and terminal connections of the components are to be checked regarding proper tightness and possible damage
- Make sure that cables are not broken or crushed.
- Replace damaged parts immediately.

15 Ordering Information

15.1 Accessories and Spare Parts

For ordering information on accessories and spare parts, please refer to [chapter 5 "Spare Parts, Accessories and Wear Parts" on page 6](#).

15.2 VDP 16.3

Abbrev. column	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9		
Example:	V	D	P	1	6	.	3	D	B	N	-	D	1	-	N	N	-	N	N		
Product																					
VDP. = VDP																					
Line																					
16 = 16																					
Design																					
3 = 3																					
Front panel and display																					
Rexroth Design																					
12", with 16 machine function																					
keys (MTX) = BK																					
12", touch screen = DB																					
Customized design																					
Bosch : 12", touch screen (suitable for food industry) = AK																					
Additional option																					
Without. = N																					
Control panel interface																					
CDI. = D1																					
Interface																					
Without. = NN																					
Other design																					
MTX design. = MX																					
Without = NN																					

Fig. 15-1: Type designation code VDP 16.3

15.3 VDP 40.3

Abbrev. column	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9
Example:	V	D	P	4	0	.	3	D	E	N	-	D	1	-	N	N	-	N	N
Product																			
VDP. = VDP																			
Line																			
40 = 40																			
Design																			
3 = 3																			
Front panel and display																			
Rexroth Design																			
15", with 16 machine function keys (MTX) = BI																			
15", touch screen = DE																			
15", touch screen with 16 machine function keys (MTX) = DF																			
17", touch screen = DG																			
15", touch screen with switching elements. = DI																			
Customized design																			
Bosch: 15", touch screen ... = AL																			
Additional option																			
Without. = N																			
Control panel interface																			
CDI = D1																			
Interface																			
Without. = NN																			
Other design																			
Inside system housing = CG																			
Inside system housing, MTX design = CX																			
MTX design = MX																			
Without. = NN																			

Fig. 15-2: Type designation code VDP 40.3

15.4 VDP 60.3

Abbrev. Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Example:	V	D	P	6	0	.	3	F	E	N	-	D	1	-	N	N	-	N	N			
Product																						
VDP. = VDP																						
Line																						
60 = 60																						
Design																						
3 = 3																						
Front panel and display																						
Rexroth design																						
19", touch screen, with front-USB. = FE																						
19", with 16 machine function keys (MTX). = FI																						
Additional option																						
Without. = N																						
Control panel interface																						
CDI. = D1																						
Interface																						
Without. = NN																						
Other design																						
MTX design. = MX																						
Without. = NN																						

Fig. 15-3: Type designation code VDP 60.3

16 Disposal

16.1 Take-Back

Our products can be returned to our premises free of charge for disposal. However, the products must be free of impurities like oil, grease or other impurities. Furthermore, the products returned for disposal must not contain any undue foreign material or foreign components.

Send the products "free domicile" to the following address:

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

16.2 Packaging

The packaging materials consist of cardboard, plastic material, wood or expanded polystyrene (EPS). The packaging materials can be recycled without any problem.

For ecological reasons, please refrain from returning the empty packages to Bosch Rexroth.

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 Helpdesk & Hotline** under:

Phone:	+49 9352 40 5060
Fax:	+49 9352 18 4941
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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 resulting in the malfunction
- Type plate name of the affected products, in particular type codes and serial numbers
- Your contact data (phone and fax number as well as your email address)

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Notes

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