



## Record of Revision

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## Editorial Department

Development automation systems control hardware HP (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.

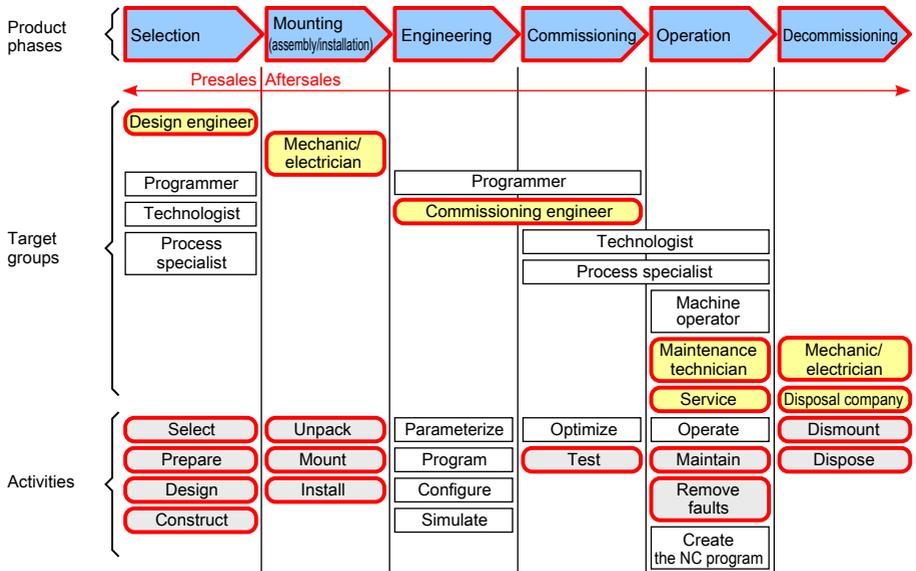


Fig. 1-1: Assigning the present documentation to the target groups, product phases and activities of the target group

### 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 Embedded Terminal.

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 "VEP30.4...", "VEP40.4..." or "VEP50.4...".

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	<a href="#">R911339612</a> Operating Instructions
Rexroth IndraControl V Devices Operating Systems	<a href="#">R911343900</a> Project Planning Manual

**Tab. 1-1:** Required and supplementing documentation

## Customer feedback

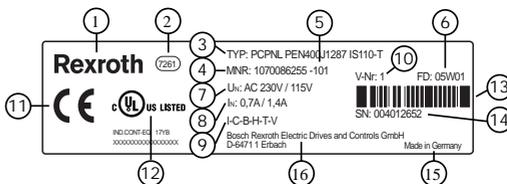
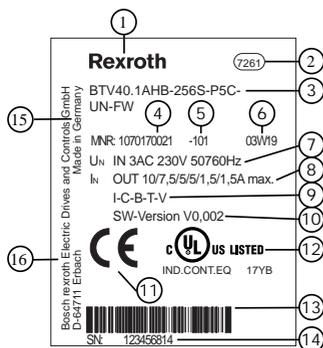
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# 2 Product Identification and Scope of Delivery

## 2.1 Product Identification

### 2.1.1 Type Plate on the Device

The type plate is located on the rear panel.



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

- 9 Test marking
- 10 Version number
- 11 CE mark
- 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

### 2.1.2 Electronic Type Plate

The device is provided with an electronic type plate. The following data is stored there:

- Operating hours counter
- Serial number of the device
- Index of the device
- Parts number of the device
- Type designation code of the device

The contents of the electronic type plate can be displayed via the Rexroth CE Settings. For a detailed description of the "Rexroth CE Settings", please refer to the project planning manual "Rexroth IndraControl V Devices Operating Systems" (see tab. 1-1 "Required and supplementing documentation" on page 2).

## 2.2 Scope of Delivery

- Embedded Terminal VEP xx. 4
- Safety instructions
- Mounting kit
- Device passport

# 3 Using the Safety Instructions

## 3.1 Safety Instructions – Structure

The safety instructions are structured as follows:

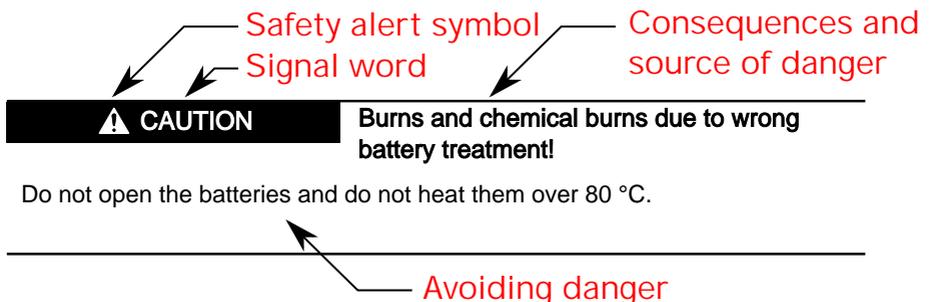


Fig. 3-1: Safety instructions – Structure

## 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 Embedded Terminals are PC based machine operator terminals. Depending on the respective configuration they can also perform control functions. The products are designed for use in industrial environments.

### **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 Embedded Terminals 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 is valid for 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.

Areas of application of the Embedded Terminals are:

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

The Embedded Terminals 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.

## 5 Spare Parts, Accessories, and Wear Parts

### 5.1 Connectors and Assembled Cables

Ordering code	Part number	Description
IKB0033/000,0	R911291808	Profibus cable
IKB0034/000,0	R911291809	Profibus cable (open cable end)

**Tab. 5-1:** Connectors and cables for Embedded Terminals

## 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 Storage Media

Ordering code	Part number	Description
CFM01.1-01G0-N-LBA-NN-NW	R911171628	Compact Flash module 1 GByte for VEP xx.4 Embedded Terminals
CFM01.1-04G0-N-LBA-NN-NW	R911171809	Compact Flash module 4 GByte for VEP xx.4 Embedded Terminals

Tab. 5-3: Storage media for the Embedded Terminals

## 5.4 Lithium Battery

Ordering code	Part number	Description
CAP01.1-B2	R911170806	3 V lithium battery for onboard SRAM

Tab. 5-4: 3 V lithium battery

## 5.5 Wear Parts

Wear parts are not subject to any warranty.

### Display

The service life of the display is limited. After the service life has been exceeded, the readability is reduced.

Service life: 50,000 hours (typically)

### 3 V lithium battery

The service life of the lithium battery is approx. five years.

To replace the battery of further Embedded Terminals (degree of protection IP 20), use the battery specified in [chapter 5.4 "Lithium Battery" on page 6](#). Replace the battery as described in this section.

## 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/m <sup>3</sup> Max. absolute humidity: 25 g/m <sup>3</sup> 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/m <sup>3</sup> Max. absolute humidity: 25 g/m <sup>3</sup> 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/m <sup>3</sup> Max. absolute humidity: 25 g/m <sup>3</sup> Condensation not allowed Corresponds to climatic class 1K2 acc. to EN 60721-3-1
Air pressure	Up to 2,000 m above sea level acc. to EN 61131-2	Up to 3000 m above sea level acc. to EN 61131-2	
Mechanical strength	Max. vibration: Frequency range: 10 Hz to 150 Hz Excursion: 0.075 mm for 10 Hz to 57 Hz Acceleration: 1 g for 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	
Contamination level	2		
Overvoltage category	2	-	

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



The surrounding air must be free from acids, alkaline solutions, corrosive agents, salts, dust, metal vapors, and other electrically conductive contaminants in high concentrations.

Housings and installation compartments must at least comply with degree of protection IP 54 according to DIN VDE 0470-1.

## 7 Technical Data

### 7.1 Front Panel of the Embedded Terminals

Display VEP 30.4...	213 mm TFT (8.4"), 800 x 600 pixels, 262144 colors
Display VEP 40.4...	304 mm TFT (12.1"), 800 x 600 pixels, 262144 colors
Display VEP 50.4...	381 mm TFT (15"), 1024 x 768 pixels, 262144 colors
Operation	<ul style="list-style-type: none"> <li>● Touch screen operation</li> <li>● Touch screen operation and key operation</li> <li>● Key operation</li> </ul>
Color of the surface – front panel	Rexroth design: RAL 7035 light gray Bosch design: RAL 7024 graphite gray
Degree of protection, front panel	IP 65 acc. to DIN 40 050, IEC 529 Front type 1 according to NEMA (UL) USB connection on the front panel IP 65 (not on all variants)
Degree of protection, overall device	IP 20

**Tab. 7-1:** Embedded Terminals, technical data



Surfaces, colors and their structure may diverge from each other slightly. Also the height and shape of the embossing may diverge from each other.



In some cases the touch screen surface may camber due to high air humidity or high temperatures. This does not impair the function of the touch screen. Blistering is no cause for a complaint.



The installed displays comply with class 2 according to ISO 13406-2. Pixel errors in the specified range are no cause for a complaint.

### 7.2 PC Boxes of the Embedded Terminals

Depending on the used PC box (Visu or IndraLogic), the Embedded Terminals differ as follows:

PC box	Visu	IndraLogic
Processor	Intel ATOM processor, 1.1 GHz Intel Celeron processor, 600 MHz or 1 GHz	
Working memory (RAM)	512 MB 1 GB (VEP 40.4EI and VEP 50.4DF) 1 GB for A2x devices (devices with ATOM processor)	
Compact Flash card	From 1 GB, second slot is free	
Interfaces, available in all variants	<ul style="list-style-type: none"> <li>● 2 x USB 2.0; connection (type A)</li> <li>● 1-2 x Ethernet connection (RJ 45, 10/100 Base-T)</li> </ul>	<ul style="list-style-type: none"> <li>● 2 x USB 2.0; connection (type A)</li> <li>● 2 x Ethernet connection (RJ 45, 10/100 Base-T)</li> </ul>
Interfaces, optional	None	Field bus interface module on NetX basis
Short-time UPS	None	Capacitor pack as short-time UPS
Enclosure rating	PC box: IP 20	
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)	
Input voltage range	DC 24 V (+19 V to +30 V)	
Emitted interference and surge immunity	$U_{\max} = 35 \text{ V}$ (for $t < 100 \text{ ms}$ )	
Max. input current	1.5 A for DC 24 V	
Max. inrush current	7 A, 6 ms	
Max. power consumption for maximum configuration	36 W	

**Tab. 7-2:** Technical data of the Embedded Terminals VEP xx.4 (IndraLogic and Visu devices)

### 7.3 Weight

VEP 30.4 (touch screen)	Approx. 2.3 kg
VEP 40.4 (touch screen)	Approx. 3.8 kg
VEP 50.4 (touch screen)	Approx. 5.4 kg
VEP 40.4 (touch screen, keys)	Approx. 3.9 kg
VEP 50.4 (touch screen, keys)	Approx. 5.5 kg

**Tab. 7-3:** Embedded Terminals, weight

## 8 Standards

### 8.1 Used Standards

Standard	Meaning
EN 61000-6-4	Generic standards - emission standard (industrial environments)
EN 61000-6-2	Generic standards – noise immunity (industrial environments)
EN 61558-2-6	Transformer for 24 V power supply unit, protective separation
EN 61131 -2	24 V current supply requirements
ISO 13850	Safety of machinery, emergency stop - principles for design
EN 60664 -1	Overvoltage category II
EN 60529	Degrees of protection (including housings and installation compartments)
EN 60068-2-6	Vibration test
EN 60068-2-27	Shock test
EN 60721-3-1 to 3	Classification of ambient conditions
UL 508	Industrial Control Equipment

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.

---

Ask your representative for the Declaration of Conformity.

## 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 Overview



Not each variant provides all the described interfaces. Which interfaces are integrated in the respective device depends on the device configuration.

---

Designation at the housing	Connection type	Connector type (integrated)	Mating connector or line (from outside)
XCF1, XCF2	Slot for Compact Flash card XCF1 Primary Master XCF2 Primary Slave	Slot for Compact Flash card	Compact Flash card
X7E1, X7E2 (as option), XETH <sup>1)</sup>	Network connection: Ethernet 10 Base T or 100 Base X	RJ45 female connector	RJ45 connector
XUSB	USB interfaces, USB 1 and USB 2	USB female connector, Type A	USB connector, Type A
X1S	DC 24 V voltage supply	Connector strip, SL pin spacing 3.5 mm, 5-pin or 3-pin	Female connector strip, BL pin spacing 3.5 mm, 5-pin or 3-pin
X7E3 (as option), X7E4 (as option)	Field bus connection: For Ethernet-based bus systems	RJ45 female connector	RJ45 connector
X7P (as option)	Profibus DP Master	D-Sub female connector	D-Sub bus connector
X7S1 to X7S4 (as option)	sercos III interfaces	RJ45 female connector	RJ45 connector
XCOM <sup>2)</sup>	Serial interface	D-Sub, 9-pin	D-Sub, 9-pin

**Tab. 9-1:** Embedded Terminals, interfaces

## 9.2 Connector Panels

### Connector panel of the MAX/MBx devices<sup>3)</sup>

1) Designation on the A2x devices

2) Only available on the A2x devices

3) Devices with Celeron processor are specified in the type designation code as "...MAX..." or "...MBx...".

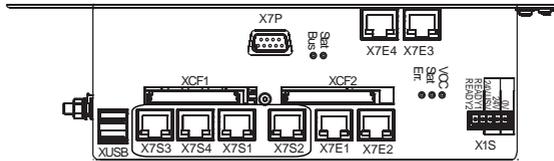


Fig. 9-1: Connector panel of the MAX/MBx devices (sample illustration)

**Connector panel of the A2x devices<sup>4)</sup>**

VEP30.4EFN, VEP40.4DBN, and VEP50.4DEN

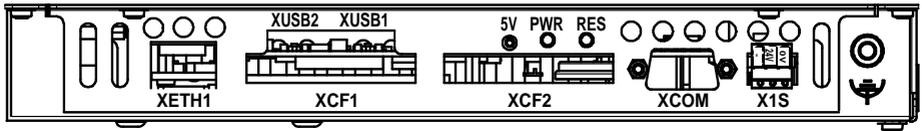


Fig. 9-2: Connector panel of the A2x devices

### 9.3 Serial Interface XCOM1

<b>D-Sub male connector, 9-pin</b>	
Type	RS232
Cable length	Max. 15 m
Cable type	Shielded, cross-section min. 0.14 mm <sup>2</sup>
Transmission rate	Max. 115200 bits/s

Tab. 9-2: Serial interface XCOM1

### 9.4 USB Interfaces XUSB



**USB devices (e. g. keyboard) switch off if the power consumption is exceeded.**

The max. power consumption of one USB connector must not exceed 500 mA.

If the maximum power consumption is exceeded, a message displays that the USB devices are disabled. The USB devices are enabled as soon as the power consumption of one USB connector is below 500 mA.

4) Devices with ATOM processor are specified in the type designation code as "...A2x..".



**Not all USB devices are recognized.**

The Windows CE operating system does not support all USB devices. Devices that require a special USB driver, which is not integrated in the system, cannot be operated at the USB interfaces.

## 9.5 Ethernet Interfaces X7E1, X7E2, and XETH

<b>RJ45, female connector, 8-pin</b>	
Type	Ethernet 10Base T / 100Base X
Cable length	Max. 100 m

Tab. 9-3: Ethernet network connection

### Ethernet interface (MAx/MBx devices) - status and diagnostic displays

#### LED link

- On: Connection to network is available
- Off: No connection

#### LED status

- On: Communication is running
- Off: No communication

### VEP xx.4 A2x devices

The VEP xx.4 A2x devices feature an Ethernet interface ("XETH"), which can be operated with 10/100 MBit and 1 GBit.

### Status and diagnostic displays of the VEP xx.4 A2x devices

#### LED link

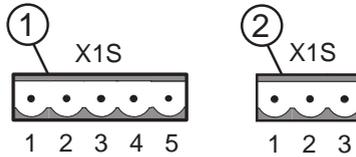
- On: Connection to network is available
- Off: No connection
- Flashing: Communication is running

#### LED Speed

- Off: 10 MB
- Green: 100 MB
- Yellow: 1 GB

## 9.6 DC 24 V Voltage Supply X1S

Cables up to a max. conductor cross-section of 1.5 mm<sup>2</sup> can be connected to the connection terminal (male connector strip SL pin spacing 3.5 mm).



- ① 5-pin connection terminal for VEP xx.4 devices (MAX/MBx devices)  
 ② 3-pin connection terminal for VEP xx.4 devices (A2x devices)

Fig. 9-3: Voltage supply connector X1S

Pin	X1S, 5-pin		X1S, 3-pin (A2x devices)	
	Function	Description	Function	Description
1	0 V	0 V voltage supply	0 V	0 V voltage supply
2	24 V	24 V voltage supply	24 V	24 V voltage supply
3	24 V UPS	24 V UPS to connect an external UPS	Not assigned	–
4	RDY1	Ready contact 1	–	–
5	RDY2	Ready contact 2	–	–

Tab. 9-4: Pin assignment of the voltage supply connector X1S

### NOTICE

Destruction of screw terminals, insufficient contact and loss of UL/CSA certification if no copper wire is used and/or wrong tightening torque.

For terminal connectors use copper wire only. Tighten the screws of the screw terminals with a torque of 2.25 lb in (0.25 Nm).

### NOTICE

Destruction of the Embedded Terminal caused by polarity reversal when the 0 V load is simultaneously grounded.

Polarity reversal of the X1S connector might destruct the operator terminal, if there is no additional external protection (fire hazard). The reason for this is the grounding of the 0 V in the operator terminal and simultaneously to that the grounding of the 0 V load (PELV).

**NOTICE**

**Damage to the Embedded Terminal caused by polarity reversal and too high input voltages.**

The Embedded Terminals are designed reverse voltage protected. Polarity reversal of the 24 V voltage supply at the X1S connector does not damage the device. Overvoltage more than 36 V and more than 500 ms damages components in the power supply area of the device.

## 9.7 Slot for Compact Flash Card XCF1 and XCF2

The Embedded Terminals feature two slots for Compact Flash cards ("XCF1" and "XCF2"). The slots are designed for Compact Flash cards type A and type B. The Compact Flash card, which contains the operating system, is contained in the scope of delivery. Further cards can be ordered, see [chapter 5.3 "Storage Media" on page 6](#).

If only one Compact Flash card is used in a device, this Compact Flash card has to be plugged in the "XCF1" slot (Master).

**NOTICE**

**Reduced performance and damage to files or file system if different or non-released Compact Flash cards are used.**

Use released Compact Flash cards only. Use similar and released Compact Flash cards only if two Compact Flash cards are required in one device.

**NOTICE**

**Data loss and uncontrolled machine movements by removing the Compact Flash card if voltage is applied.**

Before inserting or removing the Compact Flash card, do switch off the device!

## 9.8 Profibus Interface X7P

### General Information



This interface is only available for Embedded Terminals with Profibus configuration.

Pin	Signal designation	Pin	Signal designation
1	RGND – reference potential	2	NC
3	RxD/TxD-P – transmit/receive	4	NC
5	DGND – reference potential	6	VP – supply voltage - plus

Pin	Signal designation	Pin	Signal designation
7	NC	8	RxD/TxD-N – transmit/receive
9	NC	–	–

Tab. 9-5: Pin assignment of the Profibus Master interface DP-M X7P

Communication interface	Profibus DP, 12 Mbauds max., floating
Diagnostic interface	RS232C, 9600 bauds, non-isolated

Tab. 9-6: Profibus Master interface

### Status displays and diagnostic displays of the Profibus Master

The status and diagnostic displays of the Profibus Master module are visible on the front panel of the Embedded Terminals.

During the startup the Profibus Master card performs a self-test. After the initialization phase of this test (approx. 2-3 seconds), the two **ERR** and **STA** LEDs turn dark. If the test is completed without errors, the yellow **RDY** LED lights. Otherwise the **RDY** LED is flashing and the program processing is terminated. Further meanings of the display during the initialization phase are listed in the following overview, see the following table.

<b>LED BUS (red)</b>	On	Bus error and missing bus connection
	Flashing	Slave diagnostic is pending
	Off	No error, bus ok
<b>LED stat (green)</b>	On	Communication is running
	Flashing	No configuration
	On	Configuration ok

Tab. 9-7: Diagnostic display of the Profibus field bus module

## 9.9 Ready Contact X1S (MAx/MBx Devices)



The ready contact is only available for MAx/MBx devices.

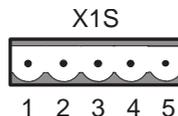


Fig. 9-4: Connector X1S

The ready contact (RDY1, RDY2) is located on X1S pin 4 and pin 5. The ready contact indicates whether the device is ready to operate and whether an error is pending.

**NOTICE**

Connectors or switching elements can be destroyed if the switching capacity is exceeded.

The switching capacity of the ready contact is 0.5 A and DC 30 V. The switching capacity must not be exceeded.

The ready contact can only be closed if there is no error and if both watchdogs are running.

The following hardware events may influence the ready contact:

- The 24 V supply voltage falls below the permissible limit
- One of the monitored voltages is outside the permissible range
- The device temperature exceeds the permissible limit
- The analog or digital watchdog is expired and displays WD\_ERR

Please find the characteristics of the ready contact in the following table:

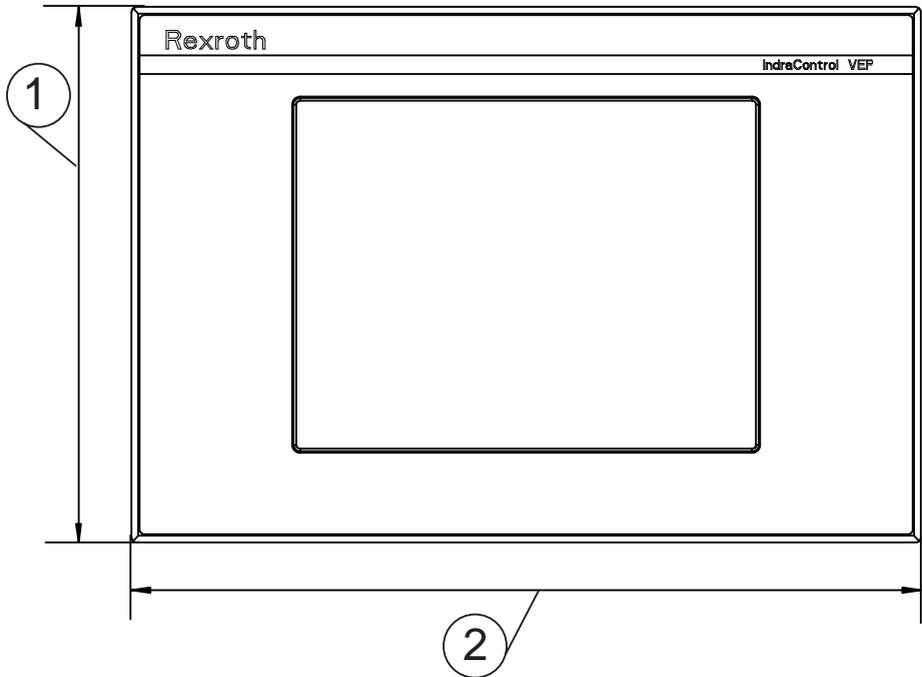
Switching capacity	0.5 A and 30 V
Response time	4 ms
Dropout time	3 ms
Bounce time	2 ms

**Tab. 9-8:** Ready contact, characteristic values

## 10 Assembly, Disassembly and Electrical Installation

### 10.1 Housing Dimensions

#### 10.1.1 Overview Housing Dimensions – Front View



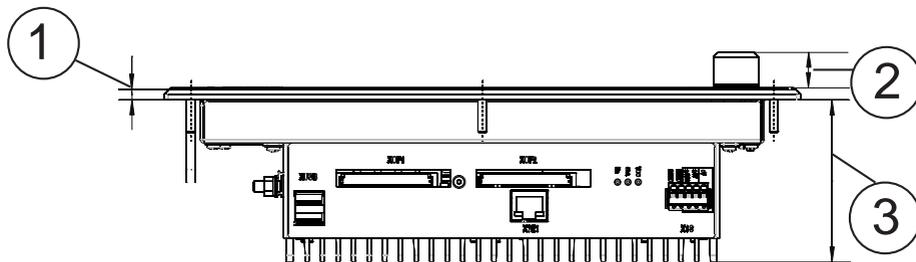
①, ② see the following table

**Fig. 10-1:** Overview: Embedded Terminals, front view

Device	Height	Width
VEP 30.4...	200 mm	296 mm
VEP 40.4...	290 mm	350 mm
VEP 50.4...	370 mm	407 mm

**Tab. 10-1:** Housing dimensions: Front panel of the Embedded Terminals

### 10.1.2 Overview Housing Dimensions - Top View



**Fig. 10-2:** Overview: Top view: Embedded Terminal (using the example of VEP 30.4)

VEP40.4DBN-512NN-A2D-NNN-NN-FW	5 mm	17 mm	51 mm
VEP40.4APN-512NC-A2D-NNN-NN-FW			
VEP30.4EFN-512NN-A2D-NNN-NN-FW	5 mm	17 mm	53 mm
VEP50.4DEN-512NN-A2D-NNN-NN-FW			
VEP30.4AON-512NC-A2D-NNN-NN-FW			
VEP50.4AQN-512NN-A2D-NNN-NN-FW			
VEP30.4EFN-512NN-MAD-NNN-NN-FW	5 mm	17 mm	75 mm
VEP50.4DEN-512NN-MAD-NNN-NN-FW			
VEP30.4AON-512NN-MAD-NNN-NN-FW			
VEP40.4DBN-512NN-MAD-NNN-NN-FW			
VEP40.4EIN-512NC-MAD-NNN-NN-FW			
VEP40.4APN-512NN-MAD-NNN-NN-FW			
VEP50.4AQN-512NN-MAD-NNN-NN-FW			
VEP50.4DFN-512NC-MAD-NNN-NN-FW	5 mm	17 mm	79 mm
VEP40.4DBU-5123C-MBD-NNN-NN-FW	5 mm	17 mm	86 mm
VEP40.4DBU-512NC-MAD-NNN-NN-FW			
VEP30.4EFU-512NC-MAD-NNN-NN-FW	5 mm	17 mm	88 mm
VEP30.4EFU-5123C-MBD-NNN-NN-FW			
VEP50.4DEU-5123C-MBD-NNN-NN-FW			
VEP50.4DEU-512NC-MAD-NNN-NN-FW			

**Tab. 10-2:** Housing dimensions: Embedded Terminal, top view

## 10.2 Installation

### 10.2.1 Installation Notes

- Avoid installation locations that are exposed to direct UV light or sunlight, because the screen readability is reduced and additional heat development can occur
- Install the Embedded Terminal in a manner ensuring easy access to the connector panel (top side)
- Provide a sufficient space of 50 mm (on all sides of the device) for sufficient cooling and cable routing
- Use strain reliefs for all cables
- Keep as much distance as possible to noise sources

### 10.2.2 Mounting Cut-out

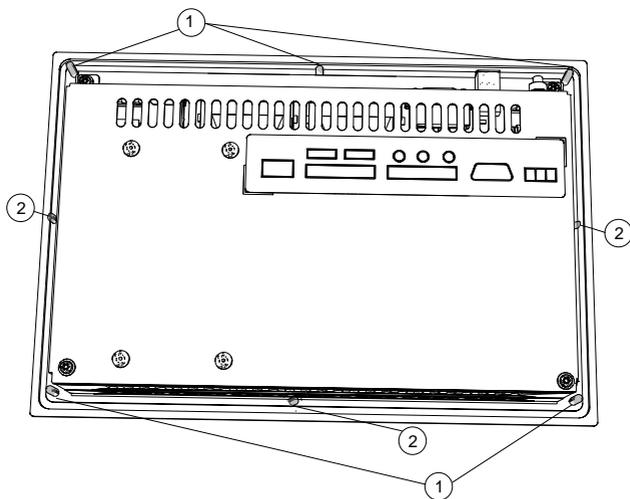
**NOTICE**

**Damage to the front panel or to the touch screen and the IP degree of protection is not kept due to incorrect installation**

- Install the devices without mechanical stress
- Provide a sufficiently sized mounting cut-out
- Provide an even mounting surface
- Ensure that no objects are squeezed

To create a mounting cut-out and to insert the Embedded Terminal proceed as follows:

1. Create a mounting cut-out with the corresponding number of holes, diameter 5 mm, according to the figures "Mounting Dimensions" on the following pages (see [chapter 10.2.3 "Mounting Dimensions VEP 30.4..."](#) on page 23 and [chapter 10.2 "Installation"](#) on page 21).
2. Insert the Embedded Terminal from the front into the cut-out and insert the mounting bolts M4 into the drilled holes.
3. Fasten the Embedded Terminal by screwing the nuts at the rear side of the mounting bolts.



- ① Mounting bolts (apply for all devices)
- ② Mounting bolts (do not apply for VEP 30.4 devices)

Fig. 10-3: Rear view: Position of the mounting bolts (sample illustration)

### **NOTICE**

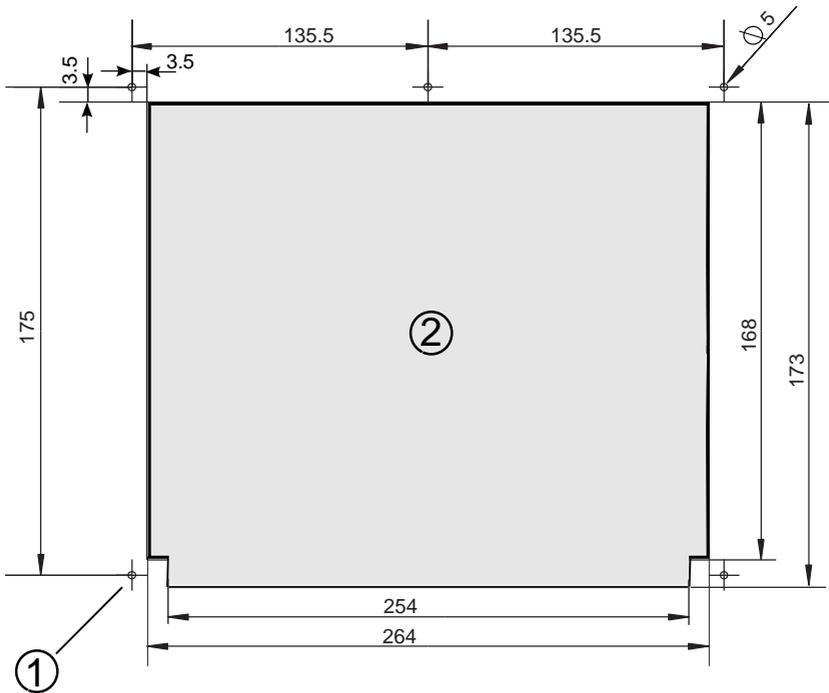
Damage of the mechanics caused by wrong tightening torque.

Tighten the screws with a torque specified in the following tables.

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

Tab. 10-3: Mounting torques

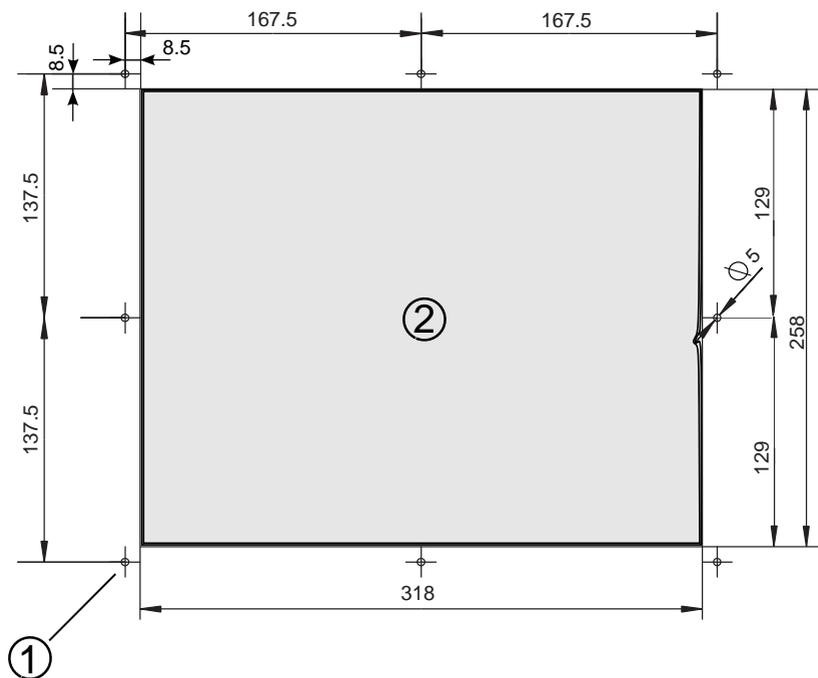
## 10.2.3 Mounting Dimensions VEP 30.4...



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

Fig. 10-4: Mounting dimensions of the VEP 77.22 cm millimetres

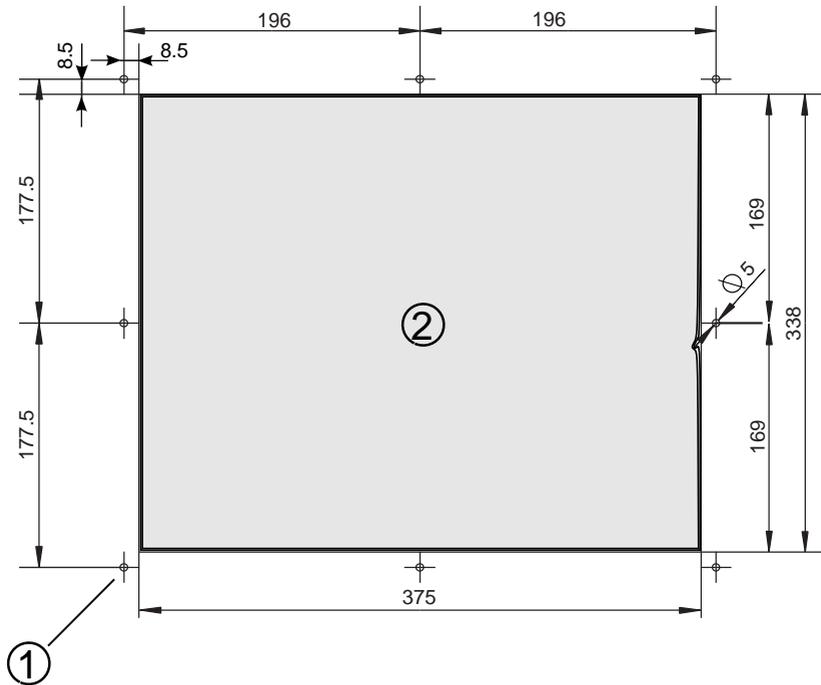
### 10.2.4 Mounting Dimensions VEP 40.4...



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

**Fig. 10-5:** Mounting dimensions of the VEP 102.62 cm millimetres

## 10.2.5 Mounting Dimensions VEP 50.4...



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

Fig. 10-6: Mounting dimensions of the VEP 128.02 cm millimetres

## 10.3 Electrical Wiring

### 10.3.1 General Information

#### **⚠ DANGER**

**Danger of death without protective separation!**

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

Plug and unplug the connector only if there is no voltage!

#### **NOTICE**

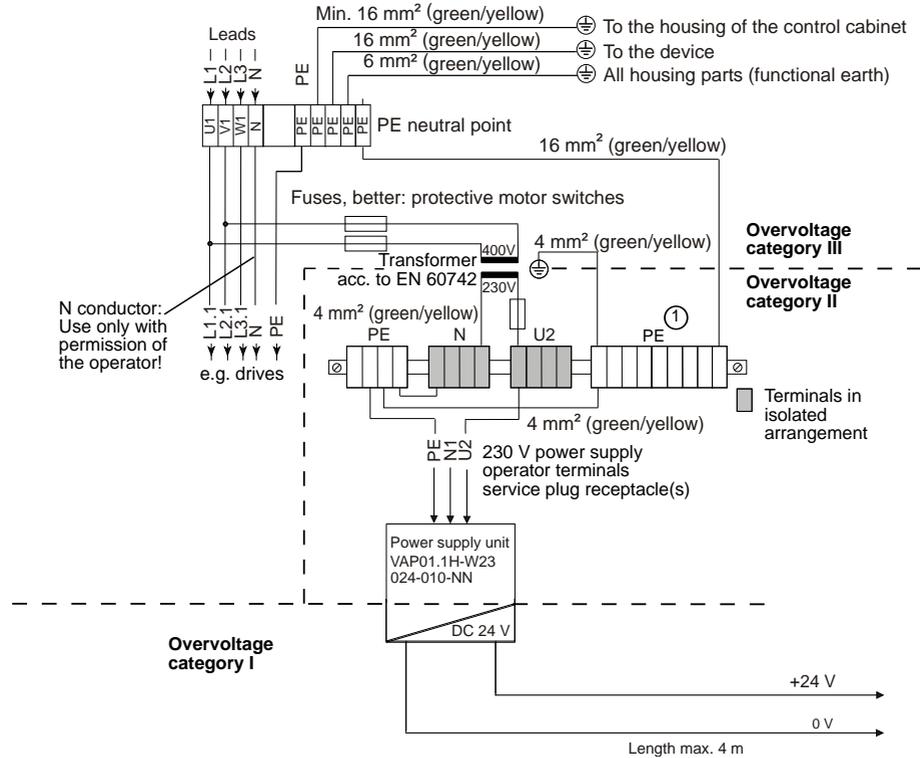
**Malfunctions due to insufficient shielding!**

Use only shielded cables and metallic, conductive connector or coupling housings with large-area shield support.

Interfering AC voltage components such as the ones resulting from an uncontrolled three-phase bridge circuit without smoothing and with a ripple factor (see DIN 40110/10.75, section 1.2) of 5 % are allowed.

That results in the greatest absolute value of 30.2 V as upper voltage limit. The lowest absolute value of 18.5 V is the lower voltage limit.

**Wiring 230 V**

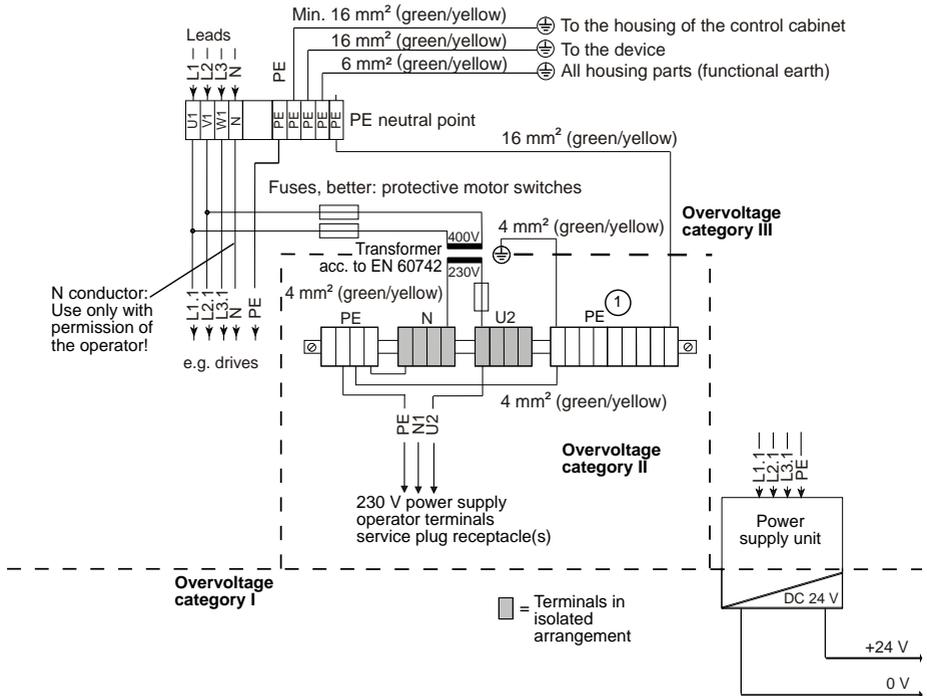


- ① PE bars are to be installed preferably on the mounting plate. In case of isolated PE bars, connect both ends to the mounting plate by means of copper strips with a maximum length of 20 cm. The cross-section of the copper strips has to be at least equal to that of the incoming mains cable.

**Fig. 10-7:** Wiring 230 V

**⚠ DANGER****Danger of death by high electrical voltage.**

- Connect power supply units, which generate protective extra-low voltage (PELV) (24 V), only to supply voltages for which the power supply units are designed. Comply with the overvoltage categories, see [fig. 10-7 "Wiring 230 V"](#) on page 26
- Do not apply the supply voltage to the protective extra-low voltage (PELV)

**Wiring 400 V**

- ① PE bars are to be installed preferably on the mounting plate. In case of isolated PE bars, connect both ends to the mounting plate by means of copper strips with a maximum length of 20 cm. The cross-section of the copper strips has to be at least equal to that of the incoming mains cable.

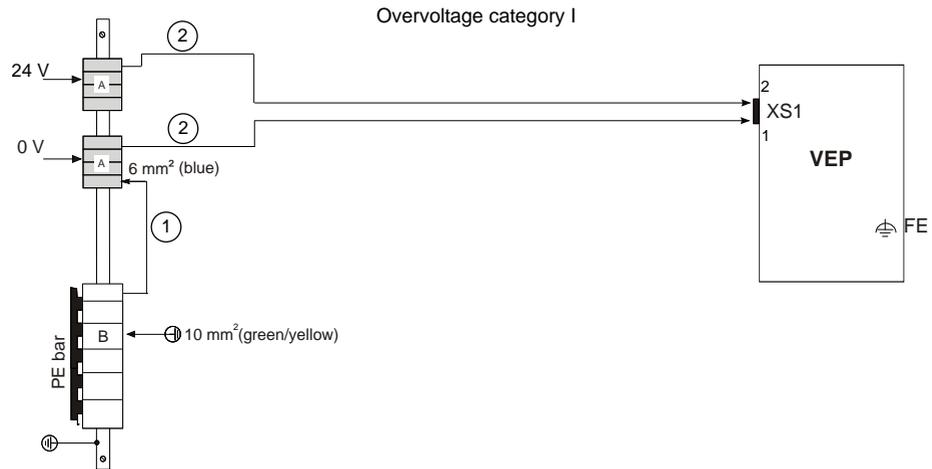
**Fig. 10-8:** Wiring 400 V

**⚠ DANGER**

**Danger of death by high electrical voltage.**

- Connect power supply units, which generate protective extra-low voltage (PELV) (24 V), only to supply voltages for which the power supply units are designed. Comply with the overvoltage categories, see [fig. 10-8 "Wiring 400 V" on page 27](#)
- Do not apply the supply voltage to the protective extra-low voltage (PELV)

**Wiring the Embedded Terminal**



- ① Easy to remove and visible
  - ② Cable length between 24 V power supply unit and VEP max. 6 m at a minimum cross-section of 0.75 mm². Cable length between 24 V power supply unit and VEP max. 10 m at a minimum cross-section of 1.5 mm². An additional power supply unit is required if the length exceeds 10 m.
- A** Isolated terminal block  
**B** Non-isolated terminal block  
**FE** Functional earth ground

**Fig. 10-9:** Wiring the Embedded Terminal

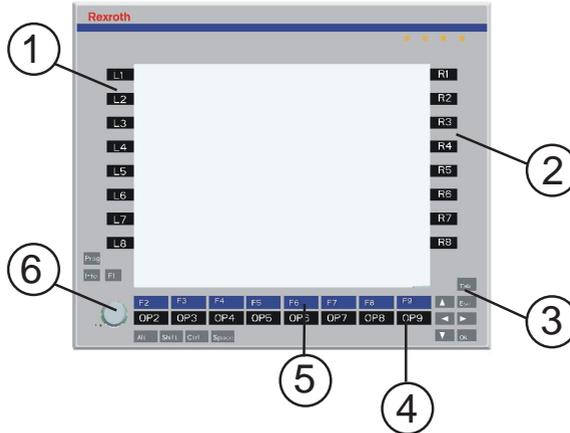
## 11 Commissioning

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

During the first commissioning, the configuration applications "touch calibration" and the "Rexroth Settings" start automatically. They are described in the project planning manual "Rexroth IndraControl V Devices Operating Systems" (see [tab. 1-1 "Required and supplementing documentation" on page 2](#)). For just delivered devices these settings are already done ex works.

## 12 Device Description

### 12.1 General Information



- ① Machine function keys (M-keys), L1 to L8
- ② Machine function keys (M-keys), R1 to R8
- ③ Navigation keys
- ④ Operating keys, OP2 to OP9
- ⑤ Function keys, F2 to F9
- ⑥ USB interface (not available on all devices)

**Fig. 12-1:** Front of the VEP xx.4 devices (sample illustration, here: VEP xx.4 with touch screen and machine function keys, Rexroth design)

#### USB interface on the front panel



The USB interface on the front panel is **not** available on all devices.

The USB interface complies with USB standard 2.0. The USB interface is sealed with a cap with the degree of protection IP 65. The cap is connected with the device. Screw on the cap again as soon as the USB interface is not used anymore.

### 12.2 Variants

The VEP xx.4 devices are available in various processor variants: They are distinguished in the type designation code as follows:

Abbreviation in the type designation code	Processor
MA	Intel Celeron 600 MHz
MB	Intel Celeron 1 GHz
A2	Intel ATOM 1.1 GHz

**Tab. 12-1:** Processor variants in the type designation code  
The VEP xx.4 Embedded Terminals are provided as different variants. They differ in the display size as well as in the design of the PC box and the housing. There are different PC boxes depending on device type and application.

Order data Parts number and type designation code	PC box			Processor, memory			Display size			Front type		
	VISU	IndraLogic	MLP	Celeron, 600 MHz, 512 MB	Celeron, 1 GHz, 512 MB	ATOM Z510, 1.1 GHz	213 mm (8.4")	304 mm (12")	381 mm (15")	Touch, Rexroth design	Touch and keys, Rexroth design	Touch, Bosch design
VEP30.4EFN-512NN-MAD-1G0-NN- FW, R911171083	X	-	-	X	-	-	X	-	-	X	-	-
VEP40.4DBN-512NN-MAD-1G0-... R911171084	X	-	-	X	-	-	-	X	-	X	-	-
VEP50.4DEN-512NN-MAD-1G0-... R911171253	X	-	-	X	-	-	-	-	X	X	-	-
VEP40.4EIN-512NN- MAD-1G0-... R911171087	X	-	-	X	-	-	-	X	-	-	X	-
VEP50.4DFN-512NN- MAD-1G0-... R911171649	X	-	-	X	-	-	-	-	X	-	X	-
VEP30.4AON-512NN-MAD-1G0-... R911171734	X	-	-	X	-	-	X	-	-	-	-	X
VEP40.4APN-512NN- MAD-1G0-... R911171735	X	-	-	X	-	-	-	X	-	-	-	X
VEP50.4AQN-512NN-MAD-1G0-... R911171736	X	-	-	X	-	-	-	-	X	-	-	X
VEP30.4EFU-512NC-MAD-1G0-... R911170857	-	X	-	X	-	-	X	-	-	X	-	-
VEP40.4DBU-512NC-MAD-1G0-... R911170858	-	X	-	X	-	-	-	X	-	X	-	-
VEP50.4DEU-512NC-MAD-1G0-... R911170859	-	X	-	X	-	-	-	-	X	X	-	-
VEP30.4EFU-5123C-MBD-1G0-... R911170825	-	-	X	-	X	-	X	-	-	X	-	-
VEP40.4DBU-5123C-MBD-1G0-... R911170861	-	-	X	-	X	-	-	X	-	X	-	-
VEP50.4DEU-5123C-MBD-1G0-... R911170862	-	-	X	-	X	-	-	-	X	X	-	-
VEP30.4EFN-512NN-A2D-NNN-... R911171834	X	-	-	-	-	X	X	-	-	X	-	-
VEP40.4DBN-512NN-A2D-NNN-... R911171835	X	-	-	-	-	X	-	X	-	X	-	-
VEP50.4DEN-512NN-A2D-NNN-... R911171836	X	-	-	-	-	X	-	-	X	X	-	-
VEP30.4AON-512NN-A2D-NNN-... R911171925	X	-	-	-	-	X	X	-	-	-	-	X
VEP40.4APN-512NN-A2D-NNN-... R911171926	X	-	-	-	-	X	-	X	-	-	-	X
VEP50.4AQN-512NN-A2D-NNN-... R911171927	X	-	-	-	-	X	-	-	X	-	-	X

**Fig. 12-2:** Overview, VEP xx. 4 variants

**PC boxes**

PC box	Description
PC box Visu	<ul style="list-style-type: none"> <li>● Celeron; 600 MHz</li> <li>● 512 MB RAM</li> <li>● 1 x 10/100 MB Ethernet</li> <li>● 2 x USB, without field bus</li> <li>● Without short-time UPS</li> </ul>
PC box IndraLogic	<ul style="list-style-type: none"> <li>● Celeron; 600 MHz</li> <li>● 512 MB RAM</li> <li>● 2 x 10/100 MB Ethernet</li> <li>● 2 x USB, NetX field bus module</li> <li>● With short-time UPS</li> </ul>
PC box MLP	<ul style="list-style-type: none"> <li>● Celeron; 1 GHz</li> <li>● 512 MB RAM</li> <li>● 2 x 10/100 MB Ethernet</li> <li>● 2 x USB</li> <li>● NetX field bus module</li> <li>● 4 x sercos III</li> <li>● With short-time UPS</li> </ul>
PC box Visu (A2x)	<ul style="list-style-type: none"> <li>● Intel ATOM Z510; 1.1 GHz</li> <li>● 512 MB RAM</li> <li>● 1 Gigabit Ethernet interface</li> <li>● 1 COM interface</li> <li>● 2 USB interfaces</li> <li>● Without field bus, without short-time UPS</li> </ul>

**Tab. 12-2:** Different PC boxes of the VEP xx.4 devices**12.3 Display and Operating Components****12.3.1 Operating and Error Display**

In the upper part of the front panel, there are four LEDs to indicate device states and errors. Depending on the variant the front panel features either labeled LEDs or illuminated symbols. The meaning of the display elements and actions in the event of failures are listed in the following table.

Symbol or LED	Display	Meaning	Measure
Von	LED green on	Normal operation	–
	LED green off	No supply voltage DC 24 V	Check the supply voltage at the power supply unit!
HDD	LED yellow	Hard disk access	–
Temp	LED off	Normal operation	–
	LED flashes red	Temperature exceeds the specified temperature range	Reduce surrounding air temperature! Connect fan, if required

Tab. 12-3: LEDs for operating and error display on the front panel

## **NOTICE**

**Destruction of keys due to operation with pointed objects**

Operate the keys only with your fingers.

### 12.3.2 Display Resolution

The resolution is set at delivery, depending on the device, and should not to be changed by the user.

### 12.3.3 Light-Emitting Diodes (LEDs) on the PC Box

Next to the XS1 voltage supply connector, there are three LEDs on the PC box. The description of the individual LEDs is listed in the following table.

LED	Color	Function
H1	Green	Supply voltage is OK
H2 <sup>1)</sup>	Yellow	Application-dependent
H3 <sup>1)</sup>	Red	Application-dependent

<sup>1)</sup> "H2" and "H3" LEDs are only available for MAX-/MBx variants

Tab. 12-4: LEDs on the PC box  
H2 and H3 LEDs can be activated by the respective application.

## 12.4 Touchscreen

Short touches of the touch screen are taken as "left mouse click". To do a "right mouse click" the touch screen is to be touched on the corresponding position for approx. 2 seconds.

**NOTICE**

Damage to front panel or to touch screen due to operation with inadequate objects (e.g. a screwdriver).

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

If the touch screen is operated with gloves, ensure that they are free from hard particles like glass fragments or chips.

**NOTICE**

Damage to front panel or to touch screen due to high pressure

Avoid high pressure when operating the touch screen.

## 13 Error Causes and Error Elimination

Error	Measures for error elimination
Reduced performance	<ul style="list-style-type: none"> <li>• Ensure that the utilization of the Compact Flash cards does not exceed 70 %.</li> </ul>
Reduced performance and damage to files or file system	<ul style="list-style-type: none"> <li>• Use released Compact Flash cards only</li> <li>• Use similar and released Compact Flash cards only if two Compact Flash cards are required in one device</li> </ul>
The system freezes or a "bluescreen" appears. In some cases the file system or the Compact Flash card can be destroyed. This can lead, among other things, to uncontrolled machine movements and data loss	<ul style="list-style-type: none"> <li>• Before inserting or removing the Compact Flash card, do switch off the device!</li> </ul>

**Tab. 13-1:** Error causes and error elimination

For information on errors that are displayed via the LEDs, please refer to [chapter 9.5 "Ethernet Interfaces X7E1, X7E2, and XETH"](#) on page 14 and [chapter 12.3 "Display and Operating Components"](#) on page 31.

## 14 Maintenance

### 14.1 General Information

**⚠ WARNING**

Danger of death due to electric shock while opening the housing!

The LC display in the Embedded Terminal is operated with high voltage, depending on the display type. Do not open the housing.

---

**NOTICE**

Maintenance work in the device is only permissible by skilled staff!

If hardware or software components have to be exchanged, please contact the Bosch Rexroth Service or ensure that only skilled staff changes the respective components.

---

**NOTICE**

Dissolution of the foil surface as well as the seal by solvents or by high pressure cleaning devices!

- Do not use any solvents (e. g. diluents)!
  - Do not use compressed air, steam jet and high pressure cleaning devices!
- 

## 14.2 Cleaning



In order to avoid incorrect operation, clean the devices only when they are switched off.

---

- Clean the screen at least once a week using an antistatic fabric or a cleansing agent containing alcohol when the device is switched off. Avoid hard objects that may cause scratches

## 14.3 Display

A fading backlight causes a progressive deterioration of the readability of the LCD, so that a backlight replacement is required. For further information, please contact the Bosch Rexroth Service (see [chapter 17 "Service and Support" on page 38](#)).

## 14.4 Regular Maintenance Tasks

Include the following measures in the maintenance schedule:

- 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 crimped
- Replace damaged parts immediately.

## 14.5 Lithium Battery

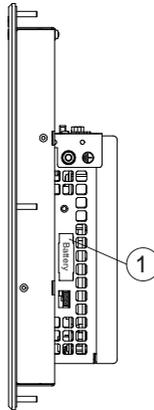
The devices are provided with a lithium battery to buffer the real-time clock in the BIOS. If this battery is empty or weak, the clock setting is lost in the BIOS.

**⚠ 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!

### Position of the battery



- ① Battery case. The battery case is located laterally on the VEP xx.4 devices (see figure). However, the battery case on the VEP xx.4 A2 devices is located on the rear panel.

Fig. 14-1: Overview: Embedded Terminals, side view (sample illustration)

### Battery exchange



Use the battery specified in [chapter 5.4 "Lithium Battery" on page 6](#) by Bosch Rexroth only.



Data loss if the device is switched off!

Ensure that the control is switched on during battery exchange.

Proceed as follows to exchange the battery:

1. Open the battery case when the device is switched on (see [fig. 14-1 "Overview: Embedded Terminals, side view \(sample illustration\)" on page 35](#)).
2. Pull the battery with the plastic strap out of the housing.
3. To insert a new battery, pull the battery cover forward using the plastic strap attached thereon.
4. Using the strap, insert the new battery into the battery holder with the positive terminal, facing the rear side of the housing.
5. Afterwards, engage the battery cover at the housing of the device.





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

## 16.3 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.

## 16.4 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 people's health when they are improperly stored 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 Helpdesk & Hotline** under:

Phone:	<b>+49 9352 40 5060</b>
Fax:	<b>+49 9352 18 4941</b>
E-mail:	<a href="mailto:service.svc@boschrexroth.de">service.svc@boschrexroth.de</a>
Internet:	<a href="http://www.boschrexroth.com">http://www.boschrexroth.com</a>

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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