rexroth
A Bosch Company

IndraControl VH 2110.01

Hand-held Terminal

Operating Instructions
R911346750

Edition 03

Revision history

Edition	Release date	Note
Edition 01	2015-01	First edition
Edition 02	2016-04	Device description revised, specification on the connecting cable supplemented, notes on the E-STOP and enabling button supplemented, UL notes on the connection module VAC also supplemented
Edition 03	2025-12	Standards updated

Editorial Department

Development Automation Systems Control Platform ChVo (MaKo/MePe)

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1 About this documentation

1.1 Overview on target groups and product phases

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

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

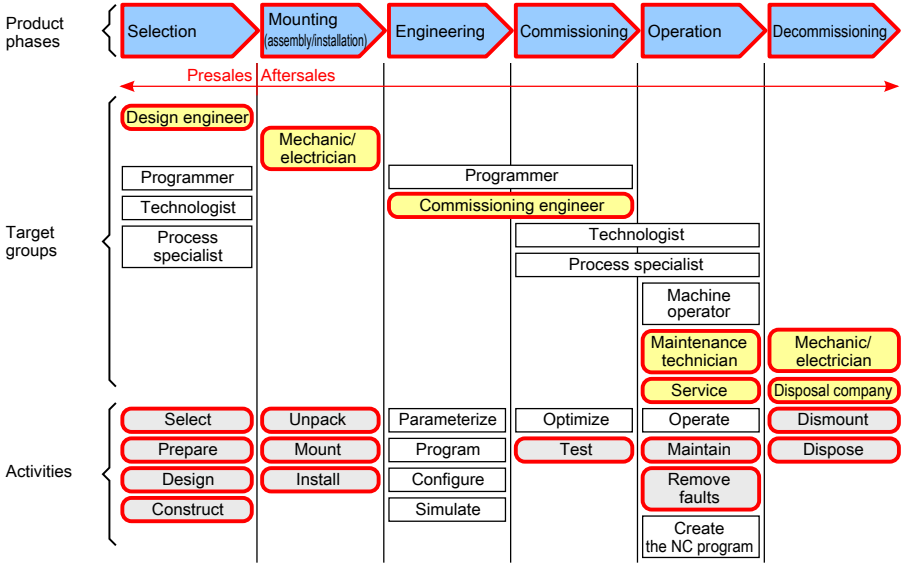


Fig. 1-1: Assigning the present documentation to the target groups, product phases and activities of the target group

1.2 Purpose

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

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

1.3 Scope

This operating instructions applies to all variants whose type code starts with "VH2110...".

The type code specifications are located on the type plate of the device, also refer to chapter 2.1 "Product identification" on page 2.

1.4 Related documents

Title	Material number and document type
IndraControl	R911338408
VAC 30.2, VAC 31.1, VAC 05.1	Operating Instructions
Connection module	
IndraControl	R911343901
V-Devices	Project Planning Manual
Operating systems	
IndraControl	R911320190
VCH 08.1	Project Planning Manual
Hand-held terminal	

Tab. 1-1: Related documents

Also refer to the descriptions of the respective system or component (e.g. IndraLogic, MTX, MLC, XLC or IndraLogic component).

1.5 Customer feedback

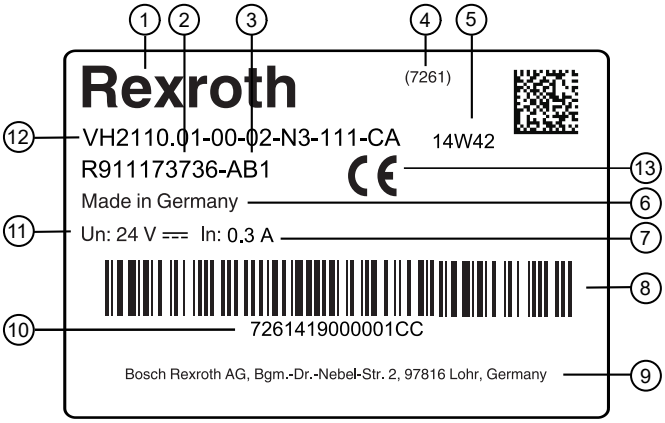
Customer requests, comments or suggestions for improvement are of great importance to us. Please email your feedback on the documentations to Feedback.Documentation@boschrexroth.de. Directly insert comments in the electronic PDF document and send the PDF file to Bosch Rexroth.

2 Product identification and scope of delivery

2.1 Product identification

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

2.1.1 Type plate



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

Fig. 2-1: Exemplary type plate

2.2 Scope of delivery

- Hand-held terminal including connecting cable
- Product insert "Safety and warning instructions"

3 Using safety instructions

3.1 Structure of the safety instructions

The safety instructions are structured as follows:

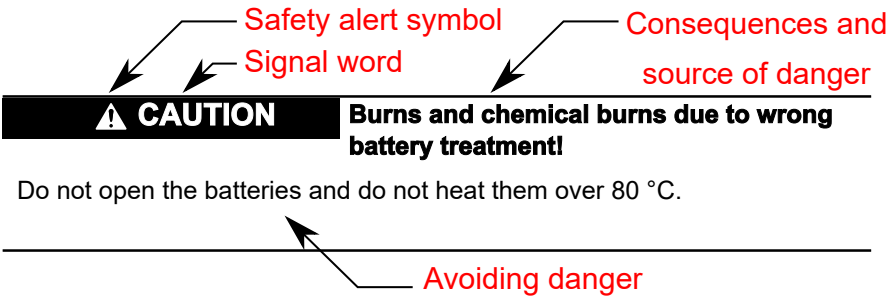


Fig. 3-1: Structure of the safety instructions

3.2 Explaining signal words and safety alert symbol

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

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

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

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

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

3.3 Symbols used

Pointers are displayed as follows:

This is a note.

Tips are displayed as follows:

This is a tip.

3.4 Explaining the signal alert symbol on the device

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

4 Intended use

The IndraControl VH21 hand-held terminals by Bosch Rexroth are machine operator panels that can, depending on the application, visualize control data and trigger functions at the machine.

NOTICE

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

The hand-held terminals may only be used 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.

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

Typical areas of application of the hand-held terminals:

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

The hand-held 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.

NOTICE Danger of destruction of the touch screen if operated with inappropriate objects.

Operate the touch screen only with your finger or with a touch pen.

5 Spare parts, accessories and wear parts

5.1 Accessories

Ordering code	Part number	Description
VAC31.1C-NN	R911171822	Connection unit with short-circuit plug for hand-held terminals with E-STOP button
VAS01.1-003-NNN-NN	R911173896	Wall holder (for stationary operation or to deposit the hand-held terminal)

Tab. 5-1: Accessory part for the hand-held terminal

5.2 Wear parts

Wear parts are not subject to any warranty.

5.2.1 Backlight

The service life of the backlight is limited. After this period, the backlight will produce only 50 % of its original brightness. The service life is 25,000 hours if the ambient temperature is 25 °C.

6 Ambient conditions

	In operation	Transport	Storage
Maximum ambient temperature	5 C to +40 C	-40 °C to +70 °C	-40 °C to +70 °C
Maximum temperature gradient	Temporal temperature changes up to 3 K per minute		
Humidity	10% to 95% non-condensing acc. to EN 61131-2		

	In operation	Transport	Storage
Air pressure	Up to 2,000 m above sea level acc. to EN 61131-2	Up to 3,000 m above sea level acc. to EN 61131-2	
Mechanical strength	Immunity to sine oscillations:	Immunity to shock:	
	5 Hz ≤ f < 9 Hz with 3.5 mm	15 g / 11 ms	
	9 Hz ≤ f < 150 Hz with 1.0 g acc. to EN 61131-2	Acc. to DIN EN 61131-2	
Degree of pollution	2		
Overvoltage category	II		

Tab. 6-1: Ambient conditions

NOTICE Defective product due to gases jeopardizing functions

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

NOTICE Failure of the product due to contaminated air

- The ambient air must not contain acids, alkaline solutions, corrosive agents, salts, metal vapors and other electrically conductive contaminants in high concentrations
- Housing and installation compartments must at least comply with the degree of protection IP 54 according to DIN EN 60529

NOTICE Risk to damage the device due to external influences

Keep the device away from oils and emulsions.

NOTICE Loss of production due to the operation of the hand-held terminal outside the specified temperature range

Only operate the device in the temperature range specified.

7 Technical data

7.1 Hand-held terminal

Processor	ARM Cortex™-A9
Clock frequency	1.0 GHz
CPU cores	2
RAM	512 MB
Flash memory	512 MB
Interfaces	Ethernet: 10/100 MBit 1 × USB 2.0 OTG, external to connect memory sticks, mouse or keyboard
Degree of protection	IP54①
Voltage supply	24 V DC (SELV, PELV acc. to DIN EN 61131)
Input voltage range	24 V DC (DC +20.4 V to DC +28.8 V acc. to EN 61131-2)
Current consumption	0.3 A (typical for 24 V)
Specified external protection	Refer to chapter 10.2 "Electrical connection" on page 15
Max. power consumption	7.2 W (300 mA for 24 V DC)
Protection class (acc. to EN 61131-2 or EN 50178)	III
Weight	Approx. 1250 g (without cable)

① The degree of protection check was not performed again for the UL approval

Tab. 7-1: Technical data of the hand-held terminal

7.2 Housing and display

Display	10.1" 1,280 × 800 WXGA 262,000 colors
Touch	Capacitive multi touch. Can be operated with two fingers
Housing	Handles: Plastic 2K Hardware support: Aluminum
Surface of the front panel	Glass
Dimensions	• Width: 325 mm • Height: 185 mm • Depth: 59.6 mm
Flame-retardant plastic	UL94-HB

Safety components	Three-stage enabling buttons, two-circuit, externally wired E-STOP button, 2-circuit, externally wired
Standard operating elements	Override switch, 16-stage, gray-coded
Connection	Connecting cable 8 m with bending protection

Tab. 7-2: Technical data of the housing and display

7.3 E-STOP button

Manufacturer name	IDEC XA series
Nominal voltage	24 V DC
Minimum current	10 mA (per contact)
Maximum current load	1000 mA (per contact)
Utilization category	DC-13 (acc. to IEC 60947-5-1)
Service life (switching cycles)	Mechanical: 250 000 Electrical: 100 000

Tab. 7-3: Technical data of the E-STOP button

7.4 Enabling button

Manufacturer name	IDEC HE6B
Nominal voltage	24 V DC
Switchable nominal current	500 mA, 13 DC (acc. to IEC 60947-5-1)
Service life	Mechanical: • Level 1 - 2 - 1: 10^6 switches • Level 1 - 2 - 3 - 1: 10^5 switches
Actuating forces	• From switch position 1 to 2: 4 N typically • From switch position 1 to 3: 17 N typically

Tab. 7-4: Technical data of the enabling button

Both switching contacts of the enabling button are designed to switch them individually. Pressing the enabling button at the edges of the button can cause that one contact switches earlier than the other contact. To avoid this, press the enabling button in the center of the button. Analyze this behavior in the risk analysis.

7.5 Connecting cable

Length	8 m
Outer diameter (D)	9.2 ± 0.3 mm
Bending radius (minimum)	Single: 3 × D Multiple: 7.5 × D
Permissible torsional stress	±180°/m
Permissible tensile stress (max.)	300 N

Tab. 7-5: Technical data of the connecting cable

7.6 Connection module VAC 31

For the technical data of the connection module VAC 31, refer to the respective operating instructions (see tab. 1-1 "Related documents" on page 2).

8 Standards

8.1 Standards used

Enabling device and E-STOP button

The operating instructions comply with the Machinery Directive 2006/42/EC.

Standard	Meaning
EC directives	
2006/42/EC	Machinery directive
2014/30/EU - Valid from 04/20/2016	EMC directive
Checking conformity with the Machinery Directive	
EN ISO 13850	Safety of machinery - E-STOP - Principles for design
EN ISO 13849-1	Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design
60204-1:2006	Safety of machinery – Electrical equipment of machines - Part 1: General requirements
Checking conformity with the EMC directive	
EN 61131-2	Programmable logic controllers – Part 2: Equipment requirements and tests
Thus, it is also complied with the following standards:	
EN 61000-6-2	EMC generic standards – Noise immunity for industrial environments

Standard	Meaning
EN 61000-6-3	EMC generic standards - Emission standard for residential environment
EN 61000-6-4	EMC generic standard – Emission standard for industrial environment
General procedures and safety principles	
EN ISO 12100:2010	Safety of machinery – General principles for design – Risk assessment and risk reduction
Strength and impermeability of the housing	
EN 60529:1991	Degrees of protection by housing
Electrical safety and fire protection	
EN 50178:1997	Electronic equipment for use in power installations
UL examination for industrial control equipment	
UL 61010-2-201	Industrial Control Equipment (NRAQ, NRAQ7)

Tab. 8-1: Standards

For the current editions refer to the EU declaration of conformity.

8.2 CE marking

8.2.1 Declaration of conformity

CE

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

- EC directive on machinery 2006/42/EC
- EC directive on electromagnetic compatibility 2014/30/EU

Conformity to the Directive 2006/42/EC is assured by the compliance with the following harmonized European standards for the E-STOP pushbutton and for the enabling button:

- EN ISO 13850
- EN 60204-1:2006

The compliance with the directive 2014/30/EU is proven by the adherence of the applicable areas to the following European standards:

- EN 61131-2

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.

For the last published version of the EU declaration of conformity, go to the Bosch Rexroth Download Center: www.boschrexroth.com/MediaDirectory: DCTC-30444-001. For further versions (e.g. older products), please contact your Bosch Rexroth partner.

8.3 UL/CSA certified

The devices are certified according to

- UL 61010-2-201 / UL 61010-1 and
- C22.2 no. 61010-2-201 / C22.2 No. 61010-1-12 (CSA)

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

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

The UL- and CSA- marking is only valid for the device in its delivery status. After having modified the device the UL and CSA compliance is to be verified.

To guarantee a UL/CSA-compliant operation, the following conditions have to be met:

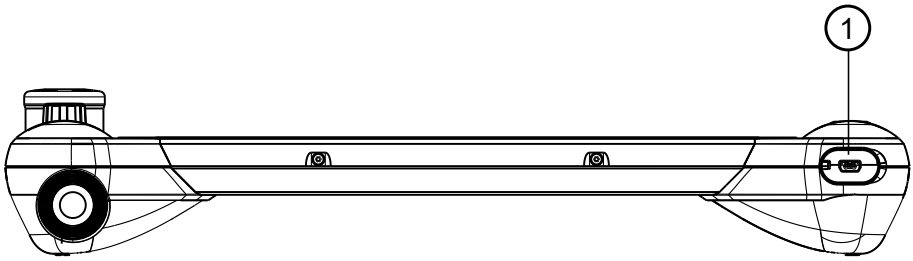
- Use only insulated copper wires suitable for at least 60/75°C

8.4 UK declaration of conformity

The products comply with the UK directive acc. to S.I. 2016/1091 (electromagnetic compatibility).

For the UK declaration of conformity, go to the Bosch Rexroth media directory: www.boschrexroth.com/MediaDirectory, search term: DCTC-30444-031

9 Interfaces



① USB-OTG interface behind a protective cover (OTG=On-the-go)

Fig. 9-1: Interfaces

To connect the USB stick, mouse and keyboard to the USB-OTG interface, a common USB-OTG adapter (mini USB of type B-plug, USB 2.0 of type A-socket) is required.

The degree of protection IP54 can only be ensured if the protective cover is closed.

- Observe the safety information and interface description in the operating instructions of the connection modules VAC 30.2, VAC 31.1, VAC 05.1, see tab. 1-1 "Related documents" on page 2.

10 Mounting, dismounting and electric installation

10.1 Housing dimensions

10.1.1 Housing dimensions of the IndraControl VH2110.01

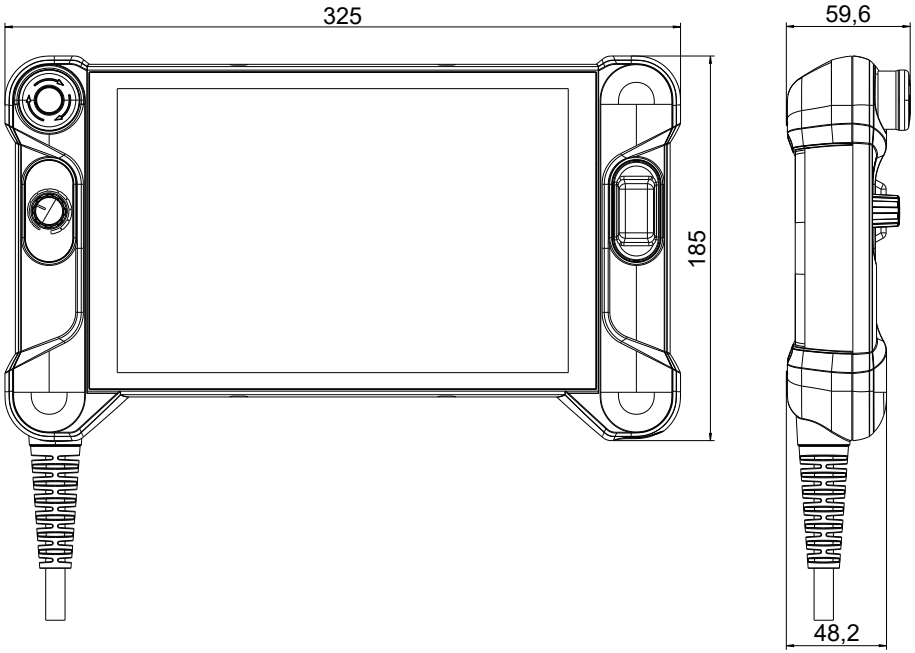
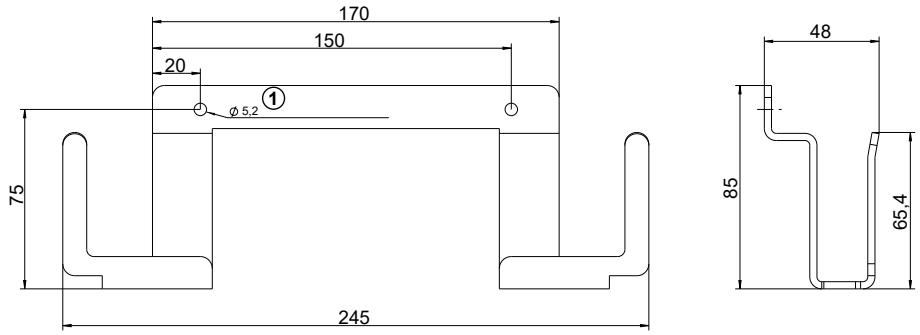


Fig. 10-1: Housing dimensions (in millimeters) of the hand-held terminal

10.1.2 Housing dimensions of the wall holder VAS 01.1



① Not less than 4.1 with finish

Fig. 10-2: Housing dimensions (in millimeters) of the wall holder, all dimensions without finish

10.2 Electrical connection

10.2.1 Connecting to the connection module VAC

NOTICE Possible damages due to missing protection at the 24 V leads

The 24 V leads as well a the circuitries of the E-STOP pushbutton and the enabling button have to be protected in front of the connection module VAC using an external overcurrent protection device.

For protection, use a overcurrent protection device (fuse) with the following specific tripping curve:

The overcurrent protection device has to trigger within 120 seconds if the current is 6.7 A. This is for example ensured when using a slow fuse of 2 A (with a respective tripping curve).

⚠ WARNING Personal injury due to wrong project planning!

- The hand-held terminal has to be projected correctly by the machine manufacturer according to the risk assessment. The following safety aspects have to be considered:
  - Correct cable length for working area limitation
  - - E-STOP or STOP pushbutton required and allowed
  - Adequate category and performance level for the relevant application
- The danger zone has to be visible by the operator positioned in the operating zone
- The device may be operated only in proper condition in adherence to the operating instructions
- The operator has to have the required qualifications and know the details of the intended use given in the operating instructions

☞ Refer to the documentation about the connection modules (see tab. 1-1 "Related documents" on page 2)

10.2.2 Connecting the safety technology

For a wiring example on the enabling button, refer to the project planning manual of the hand-held terminal VCH 08.1, chapter 7.4.6 (refer to tab. 1-1 "Related documents" on page 2)

10.3 Software-specific settings

The software of the hand-held terminal is configured via the "Rexroth Settings" application. Open the Rexroth Settings either for a short period when starting the device and during the operation via the Desktop icon "RxSettings". Some configuration dialogs are password-protected. The default password is "12345". It is recommended to change the default password via the "Rexroth settings".

The software settings are described in the project planning manual "IndraControl V-Devices, Operating Systems" (see tab. 1-1 "Related documents" on page 2).

11 Commissioning

To commission the control, further parameterization or programming is necessary.

11.1 Commissioning steps

1. Before commissioning the hand-held terminal, the operator has to ensure that the system, especially the safety devices, are appropriate.

NOTICE

Shutdown of the system by connecting a hand-held terminal with pressed E-STOP button

Before commissioning the hand-held terminal, ensure that the E-STOP button is not pressed.

2. Connect the 17-pin connector to the VAC connection module.
3. Set up the hand-held terminal and the connection module (refer to the project planning manual "IndraControl V-Devices, Operating Systems", tab. 1-1 "Related documents" on page 2).

For more details on the commissioning, refer to the documentation of the device or the system manufacturer.

11.2 On the functional safety

⚠ WARNING

Danger due to malfunctions of safety-relevant components such as E-STOP button, enabling device and safety control

The use of functional safety components does not automatically result in a functionally safe machine.

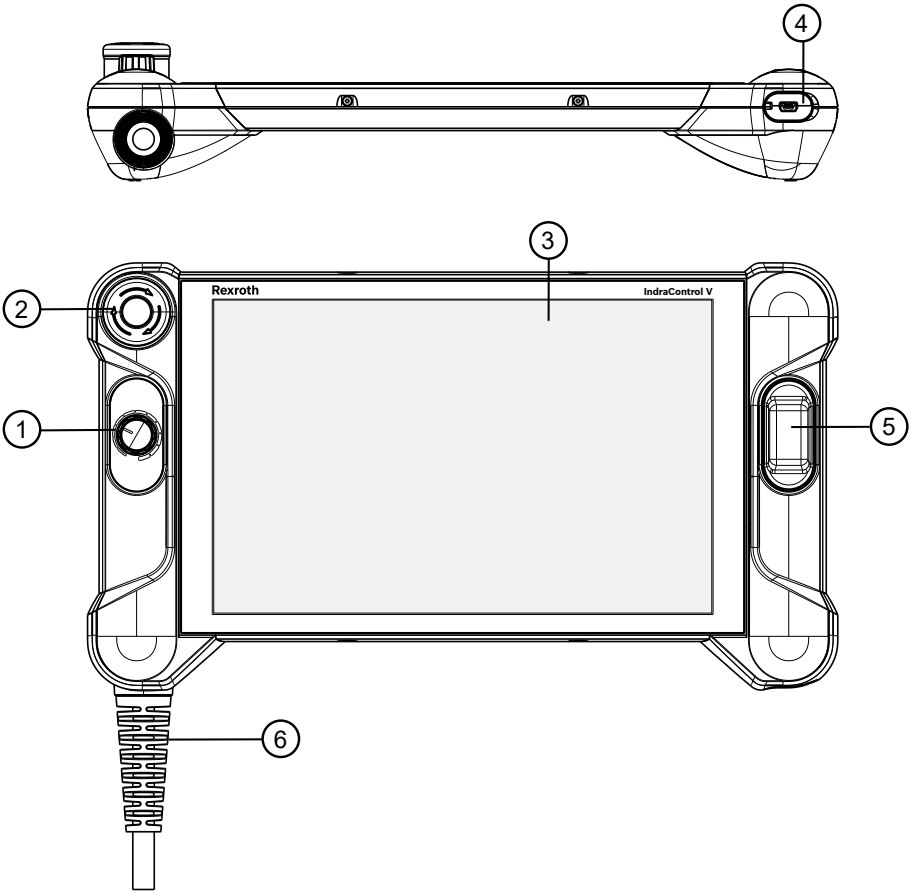
- Perform a risk analysis and validate the relevant protective measures
- The functional safety can only be ensured by comprehensively implementing the requirements (e.g. systematic measures, software requirements, etc.) according to the applicable standards (DIN EN ISO 13849 and DIN EN 62061)

12 Device description

The hand-held terminal IndraControl VH21 is a portable operating and visualization device to operate, set up, parameterize and diagnose a control connected via Ethernet.

A three-stage enabling button as well as a two-circuit E-STOP pushbutton are integrated as safety functions in the IndraControl VH21.3

12.1 View of hand-held terminal



① Override switch (gray-coded)
② E-STOP pushbutton (2-circuit)
③ Display with capacitive touch screen: 10.1" WXGA resolution (1,280 × 800)
④ USB-OTG interface (behind a protective cover)
⑤ Three-stage enabling button, 2-circuit
⑥ Connecting cable with strain relief and strain relief sleeve

Fig. 12-1: Views of the hand-held terminal

For a figure of the connection module, refer to the operating instructions of the connection module VAC30/31/05 (see tab. 1-1 "Related documents" on page 2).

12.2 Connecting to control and, selecting connection modules

The hand-held terminal IndraControl VH21 is connected to the control in frontal mounting via the connection module VAC 31. At the front side, a 17-pin socket

allows the comfortable connection of a hand-held terminal. All clamps for fixed wiring to the control are located at the rear side of the connection module in the control cabinet.

The connection modules depend on the safety components of the hand-held terminal (refer to the following table). The connection module VAC 31.1 is used for the hand-held terminal IndraControl VH21 (due to the red-yellow E-STOP pushbutton).

Connect the hand-held terminal of Bosch Rexroth only to a connection module of Bosch Rexroth and vice versa.

	IndraControl VAC 30.2	IndraControl VAC 31.1	IndraControl VAC 05.1
Actuating element Stop pushbutton, E-STOP pushbutton	For hand-held terminals with black-gray stop pushbutton	**For hand-held terminals with red-yellow E-STOP pushbutton**	For hand-held terminals with black-gray stop pushbutton
Bypassing the safety circuit if the hand-held terminal is disconnected	Automatic stop button bridging	**Short-circuit connector screwed on**	–
17-pin front connector	Fine thread	**Bayonet ending**	Fine thread
Enabling button	Led out potential-free	**Led out potential-free**	Led out potential-free

Tab. 12-1: Connection module design for the hand-held terminal

VAC 31.1: Hand-held terminals with red-yellow E-STOP buttons may be only looped in safety circuits if the system is in safe state or if a certified bypassing mechanism is available. The connection module VAC 31.1 is equipped for such devices with a bayonet joint with additional short-circuit connector in the front. Connect a hand-held terminal only if the system is in the safe state. Plugging or removing a hand-held terminal during the operation immediately sets the system to standstill.

12.3 E-STOP pushbutton

The E-STOP pushbutton at the hand-held terminal IndraControl VH21 is provided with two circuits.

The red-yellow E-STOP pushbutton at the hand-held terminal IndraControl VH21 complies with the requirements of the EN ISO 13850. It has to be designed as a "STOP" of either category "0" or "1" (see EN 60204-1) based on the risk assessment of the machine. The connection of the positive break contacts to an appropriate monitoring system must meet the category (acc. to EN ISO 13849-1) defined based on the risk assessment of the machine.

⚠ WARNING Danger due to non-functioning E-STOP buttons

Red-yellow E-STOP pushbuttons have to be effective in all operation modes of a machine or a system at any time.

Do store the *un*connected hand-held terminals with the red-yellow E-STOP pushbutton not being visible. In case of emergency, the unconnected devices are thus not mixed up with the operative devices.

- Unlocking an E-STOP facility must not result in uncontrolled start-up of machines or system
- The E-STOP pushbutton does not replace other safety devices
- The E-STOP pushbutton at the hand-held terminal does not replace the E-STOP pushbutton at the machine
- Some mechanical errors in the E-STOP pushbutton can only de detected while actuating.

  Test the function of the E-STOP pushbutton after the device had been exposed to mechanical shock (e.g. fallen on the ground).

  Additionally, the E-STOP pushbutton has to be tested cyclically by pressing the E-STOP pushbutton
- For information on the E-STOP pushbutton, refer to the documentation of the connection modules (see tab. 1-1 "Related documents" on page 2) and chapter 7 "Technical data" on page 8

12.4 Enabling button

12.4.1 Operating principle

The enabling button can have three different switch positions. Refer to the following table:

Switch position	Function	Enabling button	Switching contact
1	Home position	It is not actuated	Off (opened)
2	Enabling	It is actuated	On (closed)
3	Panic	It is actuated	Off (opened)

Tab. 12-2: Switch positions of the enabling button

⚠ WARNING Danger due to non-functioning enabling buttons

The enabling button has to be tested cyclically by pressing the panic position. Watch the machine performing the panic function after pressing the enabling switch.

The enabling button at the hand-held terminal IndraControl VH21 is provided with two circuits.

To meet the safety category 3 PL d acc. to EN ISO 13849-1, design the device for the enabling control with two circuits and with the suitable monitoring on short circuits and cross-faults.

The safety category 3 PL d means, that one error must not lead to the loss of the safety function, and whenever possible, that the individual error is detected.

12.4.2 Foreseeable misuse of the enabling button

Impermissible fixing of the enabling button in the enabling position by using auxiliary means is considered as foreseeable misuse that can be prevented.

The following measures causing the stop of the machine in the manual mode are recommended:

- Querying the enabling button when switching on the machine or the system and querying the enabling button when changing the operation mode from automatic to manual (the enabling button must not be in the enabling position)
- The enabling button has to be released within a defined period and pushed into the enabling position again. Select the length of the period with regard to the task

⚠ WARNING Danger due to non-functioning enabling buttons

- The enabling button is only suitable as protective function if the person actuating the enabling button recognizes the dangerous situation in time so that he or she can immediately take the necessary measures to avoid such situations!
- As additional measure, reduced velocity of the movement can be required. The allowed velocity has to be determined using a risk assessment
- The enabling button must not be used as only component for initiating dangerous states. A second, intentional start command is necessary
- Only the person who operates the enabling button is allowed to work in the danger zone
- For information on the enabling button, refer to the documentation of the connection modules (see tab. 1-1 "Related documents" on page 2) and chapter 7 "Technical data" on page 8

12.5 Operating system

For licensing reasons, the hand-held terminals are only delivered with an already installed operating system. For more information on the operating sys-

tem, refer to the project planning manual "IndraControl V-Devices, Operating Systems" (see tab. 1-1 "Related documents" on page 2).

13 Error causes and troubleshooting

Errors	Actions for troubleshooting
Enabling button not available	Enabling button defective. Replace device
E-STOP function not available	E-STOP button defective. Replace device
Communication with network not available	• Check the entries in the Rexroth Settings • Screw on connection plug completely. If the contacts are bent, replace the device • Check cable and replace the device if the cable is defective • Network topology
Safety circuits cannot be closed	• Completely screw in the plug • If the contacts are bent or a cable is broken, replace the device • If a safety component is defective, replace the device
Limited operability of the operating display	• Avoid strong high-frequency interferences close to the operating display

Tab. 13-1: Error causes and troubleshooting

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

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

14 Maintenance

14.1 General information

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

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

NOTICE

Dissolution of the sealing as well as the USB cover plate 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 Regular maintenance tasks

- Check all plug and terminal connections of the components for proper tightness and possible damage at least once a year
- Check that cables are not broken or crushed. Replace damaged parts immediately

14.3 Display

NOTICE

Damaging the touch screen due to incorrect cleaning

Do not use any solvent, scouring agent or scouring pads for cleaning. Use a soft cloth, moistened with water or a mild cleaning agent.

If a fading backlight causes a progressive deterioration of the display readability, replace it. For further information, please contact the Bosch Rexroth Service, see chapter 17 "Service and support" on page 25.

14.4 Servicing

The hand-held terminal is designed for the industrial environment. No special maintenance is required.

To ensure safe and non-slip handling, the hand-held terminal has to be cleaned after it has been soiled. Use a soft, dry and lint-free rag for cleaning.

15 Ordering information

15.1 Type code

Type short description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Example:	V	H	2	1	1	0	.	0	1	-	0	0	-	0	2	-	N	3	-	1	1	1	-	C	A		

01 **Unit type 1**
HMI ..... = V

02 **Unit type 2**
User terminal ..... = H

03 **Power class**
Power class S ..... = 2

04 **Processor variant**
Processor variant 1 ..... = 1

05 **Display size**
10,1" ..... = 10

06 **Design**
HW-Design ..... = 01

07 **Field bus**
None field bus ..... = 00

08 **Interface (Ethernet, USB…)**
1 x USB (OTG) + 1 x Ethernet 100 Mbit ..... = 02

09 **Remanent storage**
Without ..... = N

10 **Mass storage (hard disk, flash, SSD)**
Onboard flash min. 512 MB ..... = 3

11 **Hardware configuration**
Emergency stop, approval, three-phase, dual-circuit, override, 8 m connector cable ..... = 111

12 **Design and HMI display character**
Multi-touch in Rexroth design ..... = CA

Fig. 15-1: Type code for the VH 21

15.2 Accessories and spare parts

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

16 Disposal

16.1 General information

Dispose the products according to the respective national standard.

16.2 Return

For disposal, our products can be returned free of charge. However, the products must be free of remains like oil and grease or other impurities.

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

Send the products free of charge to the following address:

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

16.3 Packaging

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

For ecological reasons, please do not return empty packages 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 Hotline and Service Helpdesk under:

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

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

Service worldwide

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

Preparing information

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

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

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Notes

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