The Drive & Control Company

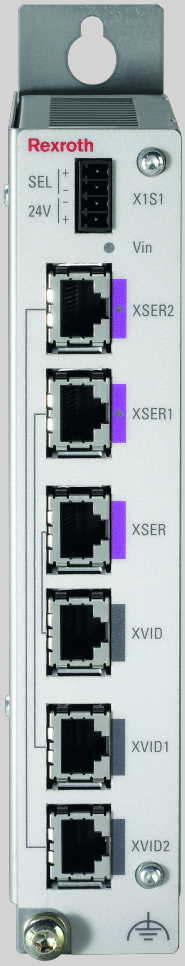
Rexroth
Bosch Group

IndraControl VAC 01

Y-Repeater

Operating Instructions
R911336973

Edition 04



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Y-Repeater

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Edition	Release Date	Notes
Edition 01	2012-02	First edition
Edition 02	2014-03	Corrections
Edition 03	2016-06	Accessories supplemented, cable lengths supplemented for the resolutions WXGA and FHD
Edition 04	2018-02	Notes on the operator display toggling supplemented in the chapter "Device description"

Editorial Department
Development Automation Systems Control Hardware HoBr (MaKo/MePe)

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Table of Contents

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 "mechanic/electrician" can execute the activity "install" using this documentation.

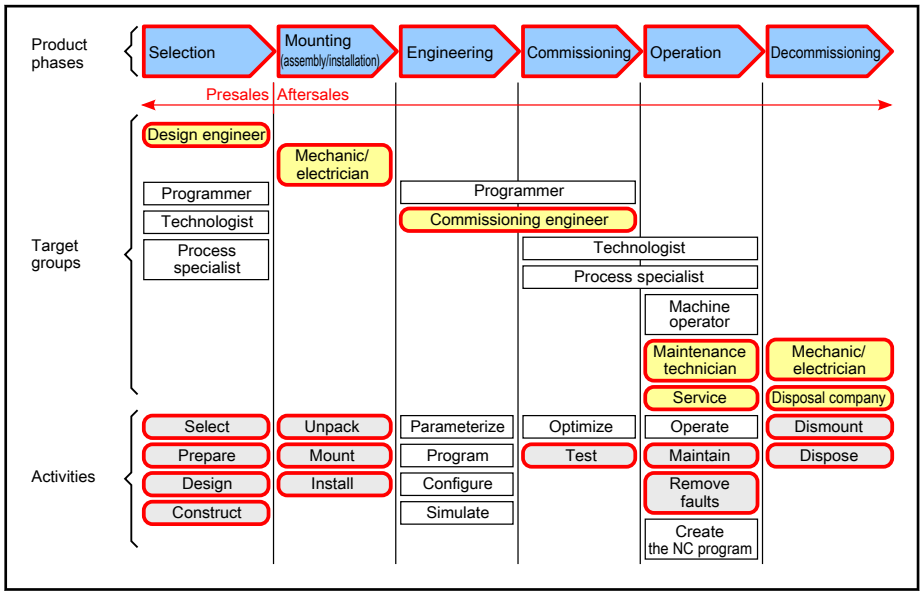


Fig. 1-1: Assigning the present documentation to the target groups, product phases and activities of the target group

1.2 Purpose

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

Required 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.

1.3 Scope

This document is valid for

- Y-repeater (type designation code VAC01.1S-YD1-NNNN)
- Y-repeater with additional digital input to enable the "Energy Save Mode" at the passive operator display (type designation code VAC01.1S-YD1-TCES)

The type code specifications are located on the type plate of the device (also refer to chapter 2.1 "Product identification" on page 7 and chapter 15 "Ordering information" on page 43).

1.4 Related documents

Title	Part number and document type
Rexroth IndraControl VAP 01 Power Supply Unit	R911339613 Operating Instructions
Rexroth IndraControl VPB 40.3 Control cabinet PC	R911336750 Operating Instructions
Rexroth IndraControl VDP 16.3/40.3/60.3 Operator Display	R911336378 Operating Instructions
Rexroth IndraControl VDP 15.3, 18.3, 21.3 Multi Touch Operator Display – Built-In Devices	R911341191 Operating Instructions

Tab. 1-1: Y-repeater, further documents

1.5 Terms and abbreviations

Name	Explanation
ESM	Digital input to enable the "Energy Save Mode" at the passive operator display
CDI	Compact Display Interface. Interface to connect the remote operator display to the control cabinet PC
XGA	Extended Graphics Array. Designates a graphics card type for the IBM PS/2 series PC launched by IBM in 1990. In contrast to the preceding standard VGA, XGA did not become an industrial standard in the PC area
SVGA	Super Video Graphics Array. Names: 1. In general graphics cards whose performance exceed the VGA standard 2. Specific computer standard (VESA 1.2), which is downward compatible to VGA, which defines specific combinations of screen resolution and number of colors (color depth) as well as the refresh rate. At least the following resolutions can be displayed on a combination of a graphics card and screen, both supporting VESA 1.2: • 800 × 600 pixels • 1024 × 768 pixels • 1280 × 1024 pixels 3. The resolution 800 × 600 pixels (aspect ratio 4:3) independent of other parameters
SXGA	Super Extended Graphics Array. Designates a resolution of 1280 × 1024 pixels, resulting in an aspect ratio of 5:4

Name	Explanation
USB	Universal Serial Bus. Serial bus system to connect a computer to external devices
Boot	Booting the control cabinet PC

Tab. 1-2: Terms and abbreviations

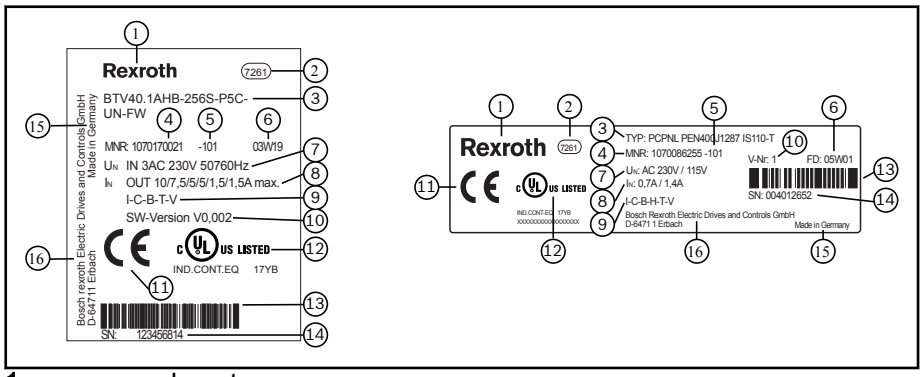
1.6 Customer feedback

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

2 Product identification and scope of delivery

2.1 Product identification

The type plate is located on the rear 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

- Y-repeater
- Safety instructions
- Plugs for X1S1 or X1S2

3 Using safety instructions

3.1 Structure of the safety instructions

The safety instructions are structured as follows:

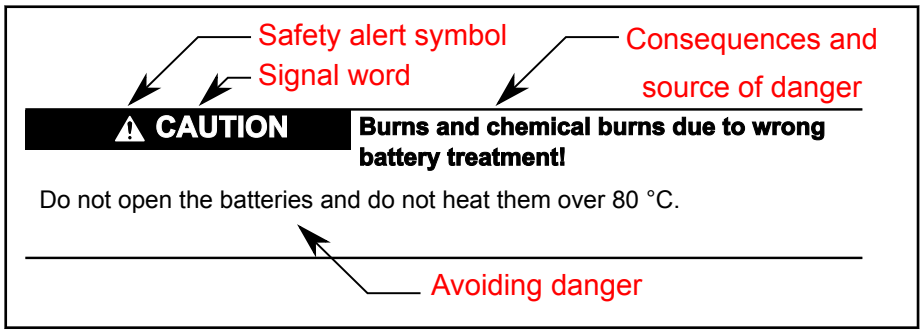


Fig. 3-1: Structure of the safety instructions

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.

Using safety instructions

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 Y-repeater is required to connect two operator displays to a control cabinet PC.

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

The Y-repeater 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.

The Y-repeater can be used for the following IndraControl V device:

- Control cabinet PC **Rexroth IndraControl VSB 40.3**

The Y-repeater 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 the related documentation.

5 Accessories

5.1 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 UPS and IndraControl V-devices

Tab. 5-1: Ordering data, 24 V power supply unit for UPS and IndraControl V-devices

5.2 Uninterruptible power supply

Ordering code	Part number	Description
VAU 01.1U	R911171024	UPS with USB communication interface and integrated accumulator Output voltage 24 V DC, 240 W

Tab. 5-2: Ordering data, uninterruptible power supply

5.3 Connecting cables for the CDI interface

Ordering code	Part number	Description
RKB0008/000,5 (*******-*******-*******)	R911171484	Length: 0.5 m
RKB0008/001,0 (*******-*******-*******)	R911171485	Length: 1 m
RKB0008/002,5 (*******-*******-*******)	R911170151	Length: 2.5 m
RKB0008/005,0 (*******-*******-*******)	R911170152	Length: 5 m
RKB0008/007,5 (*******-*******-*******)	R911172971	Length: 7.5 m
RKB0008/010,0 (*******-*******-*******)	R911170153	Length: 10 m
RKB0008/015,0 (*******-*******-*******)	R911171183	Length: 15 m
RKB0008/020,0 (*******-*******-*******)	R911171184	Length: 20 m
RKB0008/025,0 (*******-*******-*******)	R911170154	Length: 25 m
RKB0008/030,0 (*******-*******-*******)	R911171381	Length: 30 m
RKB0008/035,0 (*******-*******-*******)	R911171369	Length: 35 m
RKB0008/040,0 (*******-*******-*******)	R911171382	Length: 40 m
RKB0008/050,0 (*******-*******-*******)	R911171383	Length: 50 m
RKB0008/055,0 (*******-*******-*******)	R911173779	Length: 55 m
RKB0008/060,0 (*******-*******-*******)	R911173780	Length: 60 m
RKB0008/065,0 (*******-*******-*******)	R911173781	Length: 65 m
RKB0008/070,0 (*******-*******-*******)	R911173782	Length: 70 m

Tab. 5-3: CDI connecting cable

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

6 Ambient conditions

	In operation	Transport	Storage
Ambient temperature	+5 °C to +45 °C	-20 °C to +60 °C	-20 °C to +60 °C
Maximum temperature gradient	Temporal temperature changes up to 3 °C per minute	Temporal temperature changes up to 3 °C per minute	Temporal temperature changes up to 3 °C per minute
Relative humidity	Climatic class 3K3 acc. to EN 60721, condensing not allowed. Max. 80 % air humidity at 25 °C	Climatic class 3K3 acc. to EN 60721, condensing not allowed. Max. 80 % air humidity at 25 °C	Climatic class 3K3 acc. to EN 60721, condensing not allowed. Max. 80 % air humidity at 25 °C
Air pressure	Up to 3,000 m above sea level acc. to EN 61131-2	Up to 3,000 m above sea level acc. to EN 61131-2	Up to 3,000 m above sea level acc. to EN 61131-2
Mechanical strength	Maximum vibration Frequency range: 10 Hz to 150 Hz Excursion: 0.75 mm at 10 Hz to 57 Hz Acceleration: 1 g at 57 Hz to 150 Hz Test duration per axis: 10 frequency cycles Frequency throughput speed: 1 octave/min Acc. to EN 60068-2-6, test Fc	Max. shock: 15 g acc. to EN 60 068-2-27, no disturbance of the function	Max. shock: 15 g acc. to EN 60 068-2-27, no disturbance of the function
Contamination level	2	2	2

Tab. 6-1: Ambient conditions

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

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

Ambient conditions

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

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

7 Standards

Standard	Meaning
EN 60 61000-6-4	Generic standards - Emission standard (industrial environments)
EN 60 61000-6-2	Generic standards – Noise immunity (industrial environments)
EN 61558-2-6	Transformer for 24 V power supply unit, safe separation
EN 60664-1	Overvoltage category II
EN 60 529	Degrees of protection (including housings and installation compartments)
EN 60 068-2-6	Vibration test
EN 60068-2-27	Shock test
EN 60721-3-3	Classification of ambient conditions, operation
EN 60721-3-2	Classification of ambient conditions, transport
EN 60721-3-1	Classification of ambient conditions, storage
UL 508	Industrial Control Equipment

Tab. 7-1: Used standards, Y-repeater

7.1 CE marking

7.1.1 Declaration of conformity

CE

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

EMC directive 2004/108/EC

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

Standard	Title	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. 7-2: Standards for electromagnetic compatibility (EMC)

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

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

Standards

7.2 UL/CSA certified

The devices are certified acc. to

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

UL file no. E210730

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

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

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

8 Technical data

Degree of protection	IP 20
Weight	0.54 kg

Tab. 8-1: Degree of protection and weight

8.1 24 V input

Nominal input voltage	24 V DC (use a 24 V power supply unit acc. to DIN EN 60742, classification VDE 0551, for example the power supply unit VAP01.1H-W23-024-010-NN, part number R911171065)
Input voltage range	24 V DC +20 %, -15 %
Emitted interference and surge immunity	U_{max} = 35 V (for t < 100 ms)
Current consumption at U_N	Max. 0.165 A at 24 V
Input fuse	None
Switch-on threshold	22 V ±5 %
Switch-off threshold	19 V ±5 %
Max. power consumption	4 W
Reverse voltage protection	Yes

Tab. 8-2: Characteristic values of the 24 V input

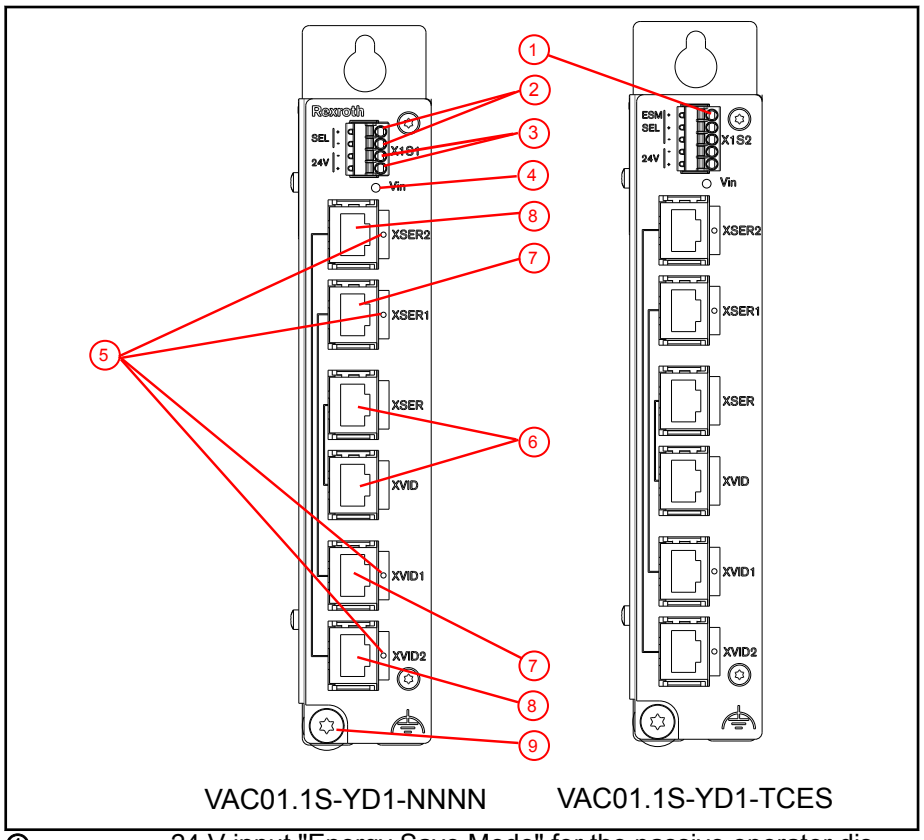
8.2 Digital 24 V inputs SEL and ESM

Reverse voltage protection	Yes
Input voltage:	
Nominal value at "0"	-3 V to 15 V
Nominal value at "1"	18 V to 30 V
Input current:	
Nominal value at "0"	< 2.5 mA
Nominal value at "1"	2.8 mA to 6 mA
Cable length (unshielded)	< 100 m
Short-circuit protection, overcurrent protection	Typ. 0.6 A

Tab. 8-3: Characteristic values of the digital 24 V inputs SEL and ESM

This ESM input is only available for the Y-repeater VAC01.1S-YD1-TCES.

9 Interfaces



① 24 V input "Energy Save Mode" for the passive operator display, X1S2
② 24 V switching input, X1S1/X1S2
③ 24 V voltage connection, X1S1/X1S2
④ LED to display the supply voltage, Vin
⑤ LED for status display (active/passive) of the connected operator display
⑥ CDI interface to the control cabinet PC, XSER, XVID
⑦ CDI interface to the first operator display, XSER1, XVID1
⑧ CDI interface to the second operator display, XSER2, XVID2
⑨ Functional earth

Fig. 9-1: Connector panel of the Y-repeater

Labeling at the housing	Connection type	Connector type (integrated)	Mating connector or cable (from outside)
X1S1	24 V voltage supply 1 digital 24 V input	Phönix connector strip, 4-pin, MC1,5/4-G-3,5THT	Phönix socket strip, 4-pin, FK-MCP 1,5/4-ST-3,5
X1S2[1)]	24 V voltage supply 2 digital 24 V inputs	Phönix connector strip, 5-pin, MC1,5/5-G-3,5THT1	Phönix socket strip, 5-pin, FK-MCP 1,5/5-ST-3,5
XSER XVID	CDI interface to the control cabinet PC	Two RJ45 sockets	Two RJ45 plugs

Interfaces

Labeling at the housing	Connection type	Connector type (integrated)	Mating connector or cable (from outside)
XSER1 XVID1	CDI interface to the first operator display	Two RJ45 sockets	Two RJ45 plugs
XSER2 XVID2	CDI interface to the second operator display	Two RJ45 sockets	Two RJ45 plugs
	Functional earth (FE)	M5	Ring cable lug

1) Only VAC01.1S-YD1-TCES

Tab. 9-1: Interfaces and connections at the Y-repeater

9.1 24 V voltage supply and digital 24 V inputs

9.1.1 VAC 01.1S-YD1-NNNN – Connection terminal X1S1

Pin	Labeling	Function
1	24 +	24 V supply voltage
2	24 –	0 V supply voltage
3	SEL –	0 V switching input
4	SEL +	24 V switching input

Tab. 9-2: Pin assignment X1S1

Switching input SEL	Active operator display
0 (no 24 V available)	Operator display 1 is active (XVID1, XSER1)
1 (24 V available)	Operator display 2 is active (XVID2, XSER2)

Tab. 9-3: Selecting the active operator display

9.1.2 VAC 01.1S-YD1-TCES – Connection terminal X1S2

Pin	Labeling	Function
1	24 +	24 V supply voltage
2	24 –	0 V supply voltage
3	ESM/SEL –	0 V for switching and ESM
4	SEL +	24 V switching input
5	ESM +	Enables the "Energy Save Mode" at the passive operator display

Tab. 9-4: Pin assignment X1S2

Switching input SEL	Active operator display
0 (no 24 V available)	Operator display 1 is active (XVID1, XSER1)
1 (24 V available)	Operator display 2 is active (XVID2, XSER2)

Tab. 9-5: Selecting the active operator display

Input ESM	Passive operator display
0 (no 24 V available)	"Energy Save Mode" at the passive operator display is not enabled
1 (24 V available)	"Energy Save Mode" at the passive operator display is enabled

Tab. 9-6: Enables the "Energy Save Mode" at the passive operator display

☞ No operation possible at the operator display at which the power LED flashes (operator display is passive).

The power LED is permanently on at the active operator display.

9.2 CDI interface

The Y-repeater is connected to the control cabinet PC and to two operator displays via the CDI interfaces (XSER, XVID, XSER1, XVID1, XSER2, XVID2).

Connection	Function
XSER, XVID	CDI interface to the control cabinet PC
XSER1, XVID1	CDI interface to operator display no. 1
XSER2, XVID2	CDI interface to operator display no. 2

Tab. 9-7: Assigning the three CDI interfaces

10 Mounting, demounting and electric installation

10.1 Installation notes

- The Y-repeater is provided for rear panel mounting
- The LED displays may not be hidden
- Provide the following minimum distances for sufficient cooling and mounting:
  - 50 mm to the bottom side
  - 80 mm to the upper side
  - 80 mm to the front side
- Lay all connecting cables in loops
- Provide cables with strain relief
- Keep as much distance as possible to noise sources when installing the Y-repeater
- Keep at least a distance of 10 cm to high-interference cables (e.g. motor cables) when routing the CDI cables. Avoid parallel cable routing

10.2 Housing dimensions

The Y-repeater has the following dimensions:

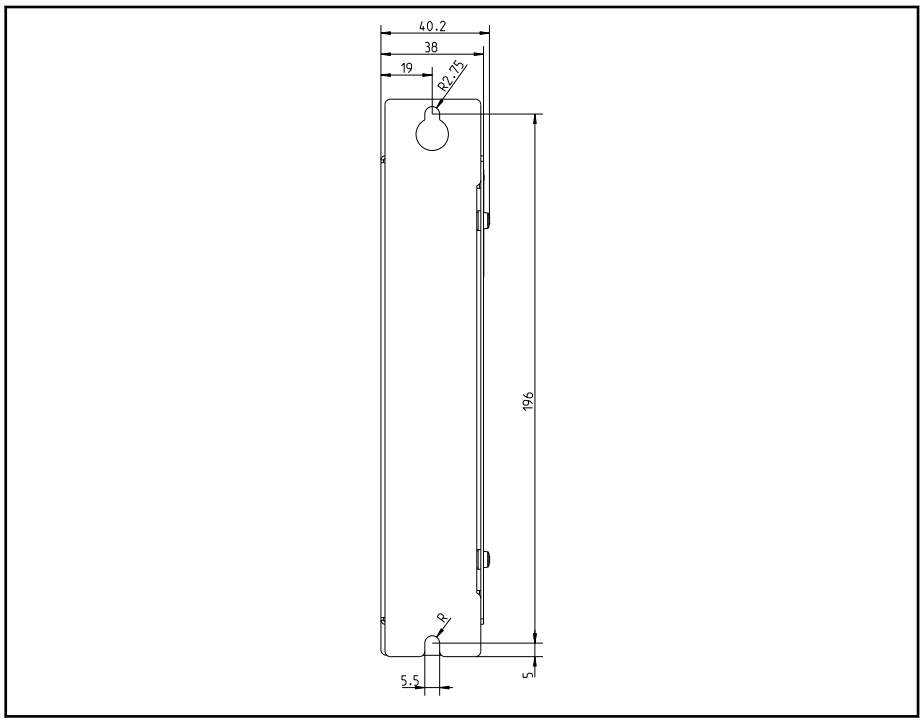


Fig. 10-1: Dimensions of the Y-repeater – rear panel

Mounting, demounting and electric installation

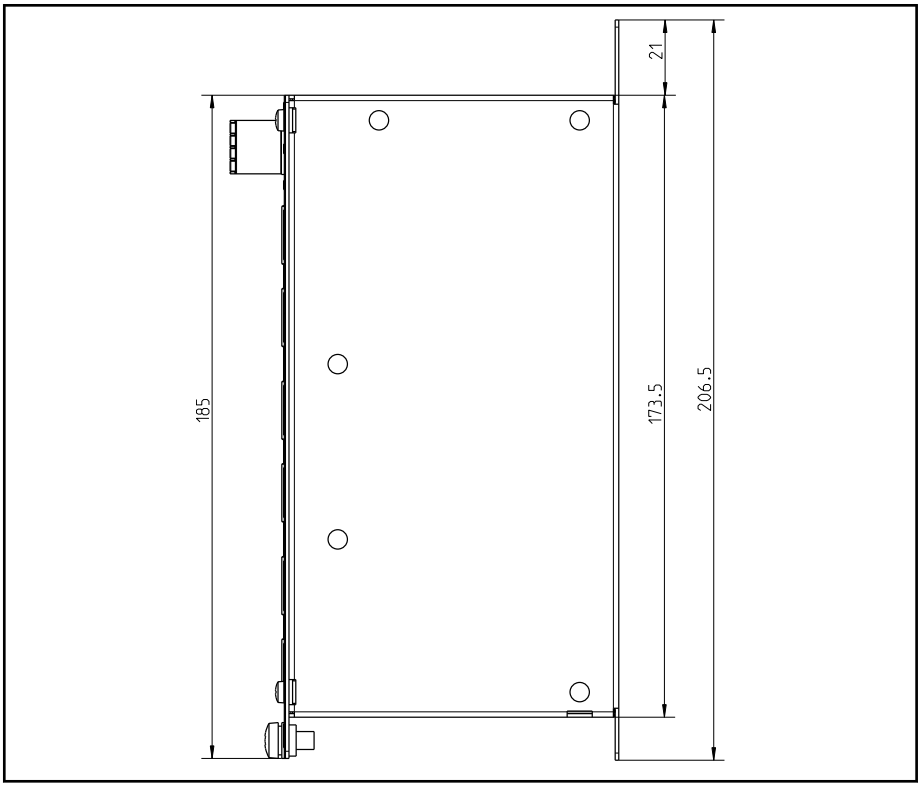


Fig. 10-2: Dimensions of the Y-repeater – side view

10.3 Pin assignment

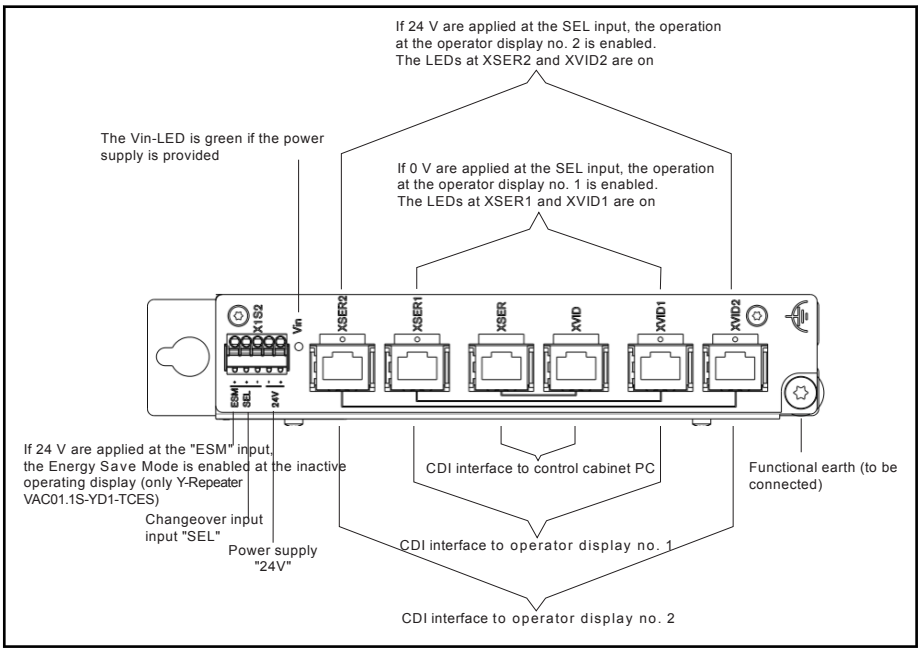


Fig. 10-3: Connections of the Y-repeater

10.4 Mounting

1. Mounting the Y-repeater to the rear panel

   The distances of the mounting holes are listed in fig. 10-1 "Dimensions of the Y-repeater – rear panel" on page 25.

Use two M5 screws to attach the Y-repeater to the rear panel.

2. Fixing the cables

   Unfixed cables are not permitted. Therefore, an appropriate fixing (e. g. installation in a cable channel) and a strain relief of the cables is required.

10.5 Demounting

Preparing the demounting

1. Demounting the Y-repeater from the rear panel

   Remove the both M5 screws used to attach the Y-repeater to the rear panel.

10.6 Electric connection

10.6.1 Procedure to connect the lines to X1S1/X1S2

Connect the lines as described in the following:

1. Strip the lines to a length of 9 mm.
2. Loosen the spring by pressing it using the screwdriver ①.
3. Put the line into the terminal point ②.
4. Fix the line by removing the screwdriver.

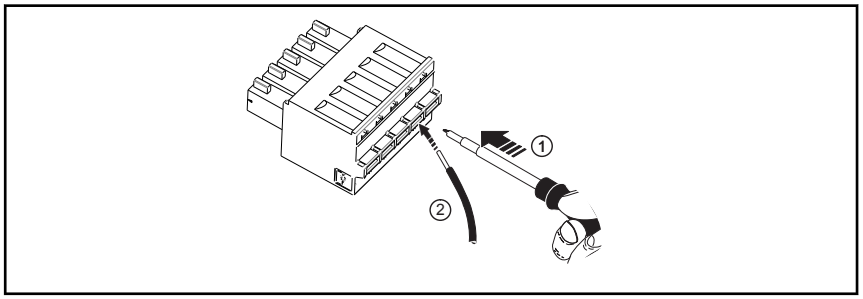


Fig. 10-4: Connecting the lines at X1S1 or X1S2

Bosch Rexroth recommends a 0.4 mm x 2.5 mm x 80 mm screwdriver.

10.6.2 Line lengths and cross-sections

Connection	Cable length	Conductor cross-sections
24 V + 24 V -	30 m max.	1.5 mm^2 (AWG 16)
SEL + ESM +① SEL/ESM* -	100 m max.	0.2 mm^2 to 1.5 mm^2 (AWG 24-16)
Functional earth	1 m max.	6.0 mm^2 (AWG 9)

① Only the Y-repeater VAC01.1S-YD1-TCES

Tab. 10-1: Cable lengths and cross-sections for the plugs X1S1 or X1S2

Mounting, demounting and electric installation

NOTICE **Destruction of screw terminals, insufficient contact and loss of UL certification if no copper wires are used.**

Use only copper wires to wire the connection terminals.

10.6.3 Connecting 24 V DC

External power supply unit

The Y-repeater is supplied from a 24 V voltage supply.

Use the Bosch Rexroth power supply unit VAP01.1H-W23-024-010-NN (see chapter 5.1 "External 24 V power supply unit " on page 13). For further information on the external power supply unit and on the creation of overvoltage categories, refer to the documentation of the power supply unit.

All lines of the 24 V voltage supply have to be wired separately from lines carrying higher voltages.

NOTICE **Destruction of the Y-repeater due to connection under voltage.**

Ensure that the control cabinet PC and the Y-repeater are disconnected from voltage before wiring.

10.6.4 Connecting digital 24 V inputs SEL and ESM

Digital input SEL

A PLC usually controls this input. Wire the respective PLC output with input "SEL" on the Y-repeater.

Digital input ESM

A PLC usually controls this input. Wire the respective PLC output with input "ESM" on the Y-repeater.

☞ This input is only available for the Y-repeater VAC01.1S-YD1-TCES.

10.6.5 Connecting the CDI interface of the Y-repeater to the control cabinet PC and the operator display

Cable lengths

The connecting cable is available in different lengths.

☞ Use only cables listed in chapter 5.3 "Connecting cables for the CDI interface" on page 13.

The cable lengths allowed at the Y-repeater depend on the display resolution set at the operator display.

The maximum cable length (from the control cabinet PC to the operator display) is 100 m with XGA resolution. Also refer to the different operating modes of the CDI interface (described in the operating instructions of the relevant operator display).

The cables on the Y-repeaters must not exceed the following lengths:

Resolution in pixels	SVGA 800 × 600	XGA 1024 × 768	SXGA 1920 × 1080	FHD 1280 × 1024	WXGA 1366 × 768
Cable lengths between the control cabinet PC and the operator display without Y-repeater	< 80 m	< 70 m	< 60 m	< 50 m	< 70 m
Cable lengths between the control cabinet PC and the Y-repeater	< 80 m	< 70 m	< 60 m	< 50 m	< 70 m
Cable lengths between the Y-repeater and the operator display	< 80 m	< 70 m	< 60 m	< 50 m	< 70 m
Total cable length between the control cabinet PC and the operator display with Y-repeater	< 100 m	< 100 m	< 100 m	< 100 m	< 100 m

Tab. 10-2: Cable lengths permitted for the Y-repeater

Malfunctions if the total cable lengths exceeds 100 m. The total cable lengths between the control cabinet PC and the operator display may not exceed 100 m.

If the total cable lengths between the control cabinet PC and the operator display exceeds 30 m, the data transmission for USB devices connected to the operator display is limited. Also refer to the chapter "S1 DIP switch" in the operating instructions of the relevant operator display.

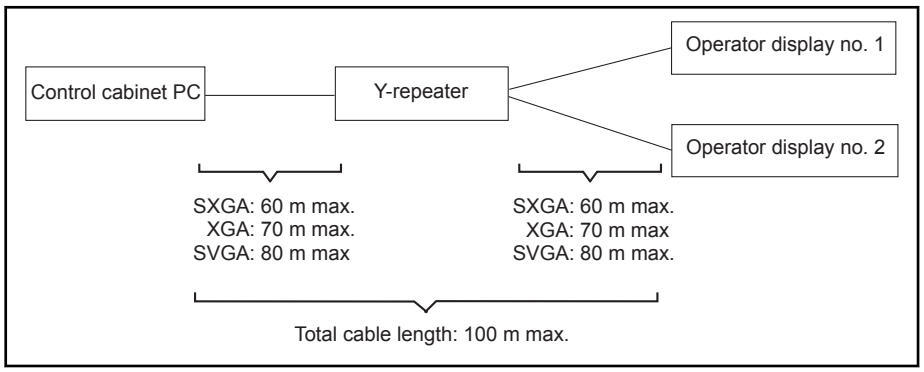


Fig. 10-5: Maximum cable length between the operator display and the control cabinet PC

Connecting two operator displays via the Y-repeater

To connect two operator displays to a control cabinet PC, the Y-repeater is switched between the control cabinet PC and both the operator displays. As the screen signals are transmitted to both operator displays, data can only be entered with the active operator display. Which of the two operator displays can be used as active operator display to operate the control cabinet PC has to be selected with a 24 V signal, see chapter 12.1 "Function of the digital inputs" on page 35.

Missing screen output or incorrect screen resolution can be caused by the following:

- The resolution of the connected operator displays is different
- The Y-repeater has been switched while booting the control cabinet PC
- The voltage supply of the operator display has been switched on after switching on the control cabinet PC

Connecting four operator displays via three Y-repeaters

Y-repeaters can be used in a cascade: Up to two further Y-repeaters can be connected to one Y-repeater. Thus, four operator displays can be connected to one control cabinet PC. As the screen signals are transmitted to all the operator displays, data can only be entered using the active operator display. Which of the four operator displays can be used as active operator display to operate the control cabinet PC has to be selected with a 24 V signal. The circuitry is shown in the following figure.

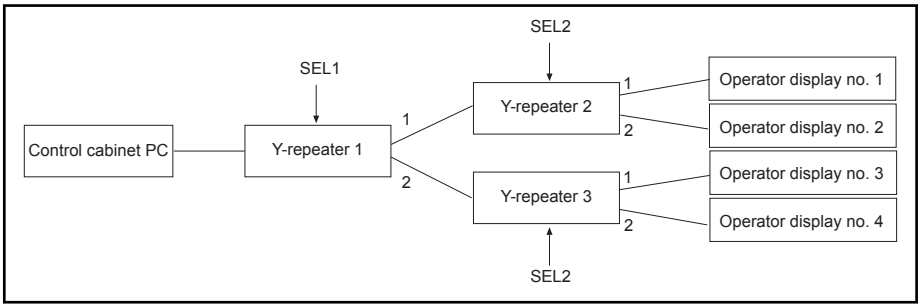


Fig. 10-6: Connection of the Y-repeater with four operator displays

SEL1	SEL2	Operator display selected
0 V	0 V	Operator display 1
0 V	24 V	Operator display 2
24 V	0 V	Operator display 3
24 V	24 V	Operator display 4

Tab. 10-3: 24 V input signal circuit in case of four Y-repeaters

10.7 Overall connection scheme

Y-repeater VAC01.1S-YD1-NNNN

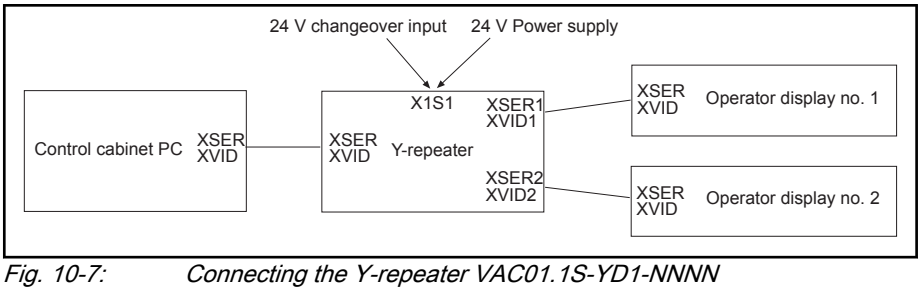


Fig. 10-7: Connecting the Y-repeater VAC01.1S-YD1-NNNN

Y-repeater VAC01.1S-YD1-TCES

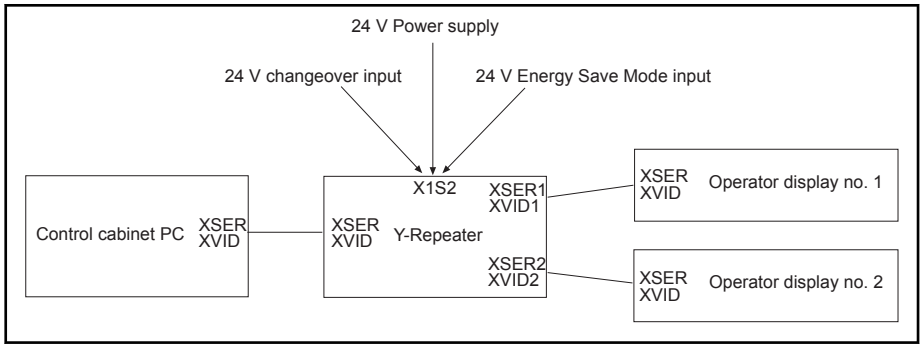


Fig. 10-8: Connecting the Y-repeater VAC01.1S-YD1-TCES

11 Commissioning

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

12 Device description

Two operator displays can be connected to one control cabinet PC using a Y-repeater. It cascades up to four operator displays, see chapter "Connecting four operator displays via three Y-repeaters" on page 30. All operator displays show the same screen. The operation is only enabled at one operator display at a time. Use the "SEL" switching input to switch the operation to another operator display. Use the "ESM" input to enable the "Energy Save Mode" at the passive operator display.

Data and signals are transmitted from the control cabinet PC to the Y-repeater via the interfaces XSER/XVID.

Data and signals are transmitted from the Y-repeater to both operator displays via the interfaces XSER1/XVID1 and XSER2/XVID2.

The ESM input is only available at the VAC 01.1S-YD1.TCES variant.

12.1 Function of the digital inputs

ESM +	
Digital input is not controlled	The image signals are displayed at the passive operator display
Digital input controlled	The passive operator display is in the "Energy Save Mode". The image signals are not displayed at the passive operator display. The LEDs on the front panel are disabled. Exception: The power LED is flashing

Tab. 12-1: Digital input ESM

SEL +	
Digital input is not controlled	Connections XSER1/XVID1 = active operator display Connections XSER2/XVID2 = passive operator display
Digital input controlled	Connections XSER2/XVID2 = active operator display Connections XSER1/XVID1 = passive operator display

Tab. 12-2: Digital input SEL

Device description

12.2 Switching times of the Y-repeater

☞ To ensure a proper operation of the operator display, ensure applicatively that the operator display toggles after the completion of the previous operator display toggling. To complete an operator display toggling, toggling can for example be impeded using an additional discrete timing element (monoflop) or via a respective logic in the PLC program. Basically, it has to be impeded applicatively that an operator display toggling is toggled during an operator display toggling. Due to the toggling times with devices to the USB ports, we recommend a temporal toggling lock of 30 seconds. Depending on the real operating conditions, it is possible to shorten this temporal toggling lock.

If an active operator display is disabled, it takes some seconds until the enabled screen can be operated. The time interval is the so-called "switching time". This switching time depends on whether USB devices are connected to "XUSBx" connections and on the used USB mode.

To achieve faster values in the standard USB mode, all connected operator displays have to be operated in the standard USB mode. The standard USB mode can be used up to a cable length of 30 meters. The DIP switch on the rear panel of the operator display has to be set correspondingly.

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

Tab. 12-3: DIP switch at the operator display

For further information, refer to chapter "S1 DIP switch" in the operating instructions of the relevant operating display.

12.2.1 Switching times without devices at the USB ports

Switching condition	Switching time in standard USB mode	Switching time in extended USB mode
Switching to an other operator display	Up to 10 seconds	Up to 20 seconds

Tab. 12-4: Switching times without devices connected to the USB ports

12.2.2 Switching times with devices to the USB ports

Switching condition	Switching time in standard USB mode	Switching time in extended USB mode
Switching to an operator display at which only already known USB devices are connected to the same USB port	Up to 5 seconds	Up to 10 seconds
Switching to an operator display at which a new USB device has been connected	Up to 30 seconds (Period until the new USB device is correctly installed by Windows)	Up to 30 seconds (Period until the new USB device is correctly installed by Windows)

Tab. 12-5: Switching times with devices connected to the USB ports

☞ If the disabled operator display is not in the "Energy Save Mode", the devices connected to the USB ports XUSBx can still be operated for three seconds. The key operation and touch operation of the deselected operator display is disabled immediately.

12.3 Display elements

There are five LEDs on the Y-repeater (see fig. 9-1 "Connector panel of the Y-repeater" on page 21). The LEDs indicate the current operating state.

LED	Meaning
Vin	Display of the 24 V voltage supply
XVID1 XSER1	Operating state, operator display 1
XSER2 XVID2	Operating state, operator display 2

Tab. 12-6: LEDs at the Y-repeater

12.4 Operating and error display

Start the measures specified in the following table if one of the LEDs is on.

LED	Name	Meaning	Action
Vin	LED is on	Normal mode	-
	LED is off	24 V DC missing	Check the cable of the voltage supply connected to X1S1 or X1S2
XSER1 **XVID1**	LEDs are flashing	Operation at operator display 1 is enabled	-
	LEDs are off	Operator display 1 is passive	-

Device description

LED	Name	Meaning	Action
XSER2 XVID2	LEDs are flashing	Operation at operator display 2 is enabled	-
	LEDs are off	Operator display 2 is passive	-

Tab. 12-7: Description of the LED states

13 Error causes and troubleshooting

Device states are indicated at the front panel via LED.

The arrangement of the LED on the front panel is shown in [External link could not be resolved.].

Errors	Troubleshooting
LED Vin at the Y-repeater is not on	• Plug not connected to X1S1 or X1S2① • External voltage supply does not supply voltage
The active operator display cannot be operated	• Check whether all cables are plugged on at the CDI interfaces (control cabinet PC, operator display and Y-repeater) • Check for the plugs X1S1 or X1S2 at the input SEL • Check for the plug X1S2 at the input ESM①
No image is displayed at the active operator display	• Check whether all cables are plugged on at the CDI interfaces (control cabinet PC, operator display and Y-repeater) • Check for the plugs X1S1 or X1S2 at the input SEL • Check for the plug X1S2 at the input ESM①
The active operator display cannot be operated. No image is displayed and the Vin LED is on at the control cabinet PC	• XSER cable and XVID cable to the Y-repeater are interchanged

① Only the Y-repeater VAC01.1S-YD1-TCES

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

NOTICE **Loss of IP degree of protection due to incorrect maintenance.**

Ensure that the IP degree of protection remains during maintenance!

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

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

14.1 Regular maintenance tasks

The Y-repeater is maintenance-free.

- Check all plug and terminal connections of the components for proper tightness and possible damage at least once a year
- Check that no cables are broken or pinched
- Replace damaged parts immediately

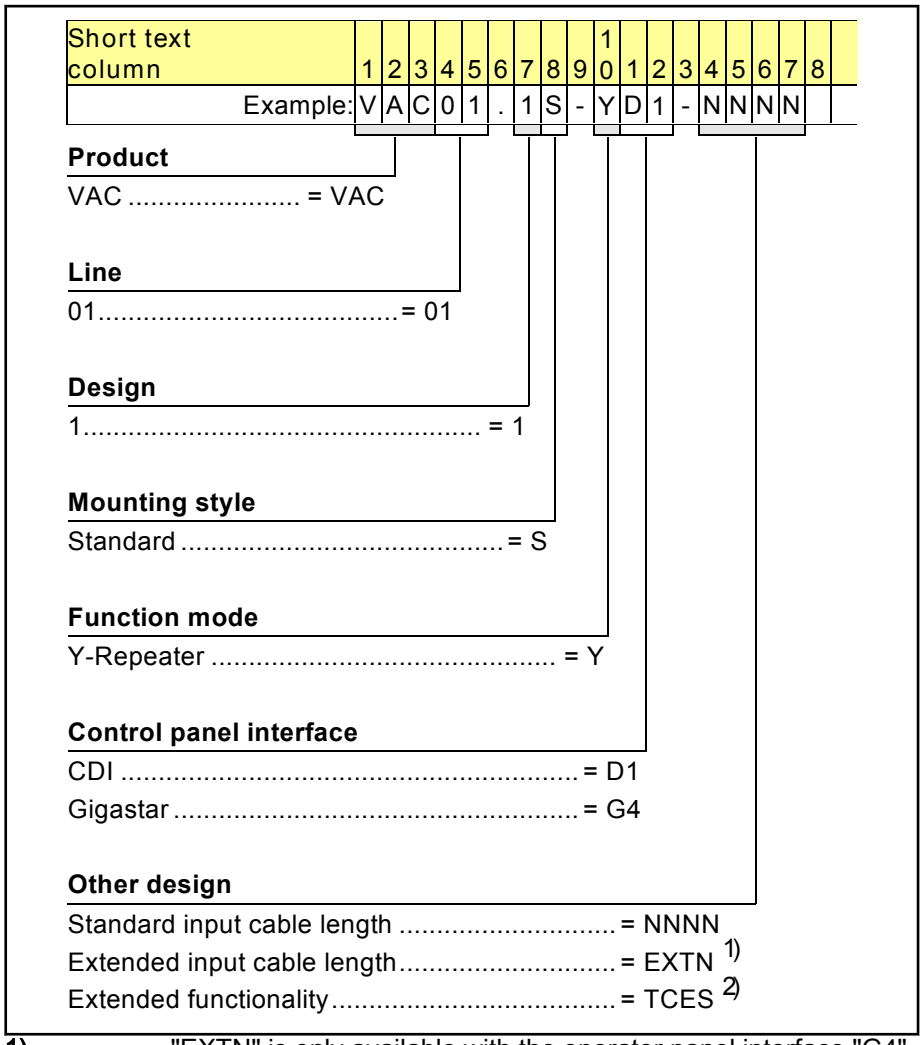
15 Ordering information

15.1 Accessories and spare parts

For ordering information on accessories and spare parts, refer to chapter 5 "Accessories" on page 13.

15.2 Type code

The Y-repeater with CDI interface is available in different variants according to the following type code:



1) "EXTN" is only available with the operator panel interface "G4"
2) "TCES" is only available with the operator panel interface "D1"

Fig. 15-1: Type code for the Y-repeater variants

16 Disposal

16.1 Return

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 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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