

Rexroth IndraControl VDP 16.1 Rexroth IndraControl VDP 40.1 Rexroth IndraControl VDP 60.1

R911307654
Edition 02

Project Planning Manual



Title Rexroth IndraControl VDP 16.1
 Rexroth IndraControl VDP 40.1
 Rexroth IndraControl VDP 60.1

Type of Documentation Project Planning Manual

Document Typecode DOK-SUPPL*-VDP16/40/60-PR02-EN-P

Internal File Reference Document Number, 120-2100-B368-02/EN

Purpose of Documentation This documentation describes the displays VDP 16.1, VDP 40.1 and VDP 60.1 as well as the Y-Repeater available as accessories.

Record of Revisions

Description	Release Date	Notes
120-2100-B368-02/EN	02/05	First English Edition

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Published by Bosch Rexroth AG
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Note This document has been printed on chlorine-free bleached paper.

Contents

1	System Presentation	1-1
1.1	Brief Description VDP 16.1, VDP 40.1 and VDP 60.1	1-1
1.2	Variants.....	1-1
	Distinguishing Features	1-1
	Displays with Keypad	1-2
	Displays with Touch Screen	1-2
	Variants VDP 16.1	1-3
	Variants VDP 40.1	1-5
	VDP 60.1	1-7
1.3	Commissioning	1-7
2	Important Directions for Use	2-1
2.1	Appropriate Use.....	2-1
	Introduction	2-1
	Areas of Use and Application	2-2
2.2	Inappropriate Use	2-2
3	Safety Instructions for Electric Drives and Controls	3-1
3.1	Introduction	3-1
3.2	Explanations	3-1
3.3	Hazards by Improper Use.....	3-2
3.4	General Information	3-3
3.5	Protection Against Contact with Electrical Parts.....	3-4
3.6	Protection Against Electric Shock by Protective Low Voltage (PELV)	3-5
3.7	Protection Against Dangerous Movements	3-6
3.8	Protection Against Magnetic and Electromagnetic Fields During Operation and Mounting	3-7
3.9	Protection Against Contact with Hot Parts.....	3-8
3.10	Protection During Handling and Mounting.....	3-8
3.11	Battery Safety	3-9
3.12	Protection Against Pressurized Systems.....	3-9
4	Technical Data	4-1
4.1	Front Panel	4-1
4.2	Power Supply.....	4-1
4.3	Ambient Conditions.....	4-2
4.4	Used Standards	4-2
4.5	Wear Parts	4-3
4.6	Compatibility Test	4-3

5	Dimensions	5-1
5.1	Dimensions of the VDP Displays	5-1
	Housing Dimensions VDP 16.1	5-1
	Housing Dimensions VDP 40.1	5-4
	Housing Dimensions VDP 60.1	5-7
5.2	Housing Dimensions of the Y-Repeater	5-9
5.3	Installation	5-10
	Installation Notes	5-10
	Mounting Cut-Out	5-10
	Mounting Dimensions VDP 16.1	5-11
	Mounting Dimensions VDP 40.1	5-12
	Mounting Dimensions VDP 60.1	5-13
6	Display and Operating Components	6-1
6.1	Backlight Switch-Off	6-1
6.2	Operating and Error Indication	6-5
6.3	Keypad	6-6
	System Requirements	6-6
	Position of the Keys	6-6
	VDP 16.1 and VDP 40.1	6-7
	VDP 60.1	6-10
6.4	Touch Screen	6-12
6.5	Light-Emitting Diodes at the Y-Repeater	6-13
7	Interfaces	7-1
7.1	Interfaces at the VDP	7-1
	View on the Connector Panel	7-1
	Description of the Interface	7-1
	24 VDC Power Supply	7-2
	USB Interfaces	7-3
	GIGASTAR Interface	7-4
	Combined Keyboard/Mouse Interface	7-4
	Mouse Interface	7-5
	PROFIBUS DP Interface	7-6
7.2	Interfaces at the Y-Repeater	7-7
	View on the Connector Panels	7-7
	Description of the Interface	7-7
	Connection of the Y-Repeater (Block Diagram)	7-7
	GIGASTAR Interface	7-8
	Digital 24 V Input (Changeover Input)	7-9
8	Maintenance and Installation	8-1
8.1	General Information	8-1
8.2	LCD Display	8-1
8.3	Connection of Two VDP Displays via the Y-Repeater	8-1

9	Touch Screen Software	9-1
10	Ordering Information	10-1
10.1	Type Code	10-1
	VDP 16.1	10-1
	VDP 40.1	10-2
	VDP 60.1	10-3
10.2	Accessories	10-4
	Y-Repeater	10-4
	Connecting Cable to the IPC 40.2 (GIGASTAR Interfaces).....	10-4
	Storage Media	10-4
11	List of Figures	11-1
12	Index	12-1
13	Service & Support	13-1
13.1	Helpdesk.....	13-1
13.2	Service-Hotline	13-1
13.3	Internet.....	13-1
13.4	Vor der Kontaktaufnahme... - Before contacting us...	13-1
13.5	Kundenbetreuungsstellen - Sales & Service Facilities	13-2

1 System Presentation

1.1 Brief Description VDP 16.1, VDP 40.1 and VDP 60.1

The displays VDP 16.1, VDP 40.1 and VDP 60.1 are passive operator and visualization terminals, that represent in combination with an industrial PC of Bosch Rexroth equipped with a GIGASTAR interface a PC-based operator terminal. At present, as IPCs the following types are available: IPC 40.2, VSB 40.1 or VPB 40.1. As the VDP 16.1, VDP 40.1 and VDP 60.1 can be mounted in the door of the control cabinet or on a bracket with low installation depth, the industrial PC can for example be mounted in the control cabinet. The data transmission between the IPC and a display VDP 16.1, VDP 40.1 or VDP 60.1 occurs via the GIGASTAR interface.

Using the Y-Repeater offered as accessories two VDP displays can be connected to the IPC.

1.2 Variants

Distinguishing Features

The displays are provided as different variants (see type code in chapter 10). Essentially, they differ in display size and touch screen capability. VDP 60-type displays feature additional alphanumeric keys.

VDP 16.1	BB	-	BK
VDP 16.1 with customer-specific design for Bosch	-	AC	-
Display	12" TFT		
Touch screen	Yes	Yes	No
Keys (keypad)	No	No	16 machine function keys
Purpose	Default applications	e. g. food industry	Default applications

Fig. 1-1: Distinguishing features VDP 16.1

VDP 40.1	BE	-	BI
VDP 40.1 with customer-specific design for Bosch	-	AG	-
Display	15" TFT		
Touch screen	Yes	Yes	No
Keys (keypad)	No	No	16 machine function keys
Purpose	Default applications	e. g. food industry*	Default applications

Fig. 1-2: Distinguishing features VDP 40.1

VDP 60.1	BL
Display	12"
Touch screen	No
Keys (keypad)	Machine function keys and alphanumeric keys

Fig. 1-3: Features VDP 60.1

* Front panels for the food industry provide tapered edges, no USB female connector and greater dimensions as the standard front panels.

Displays with Keypad

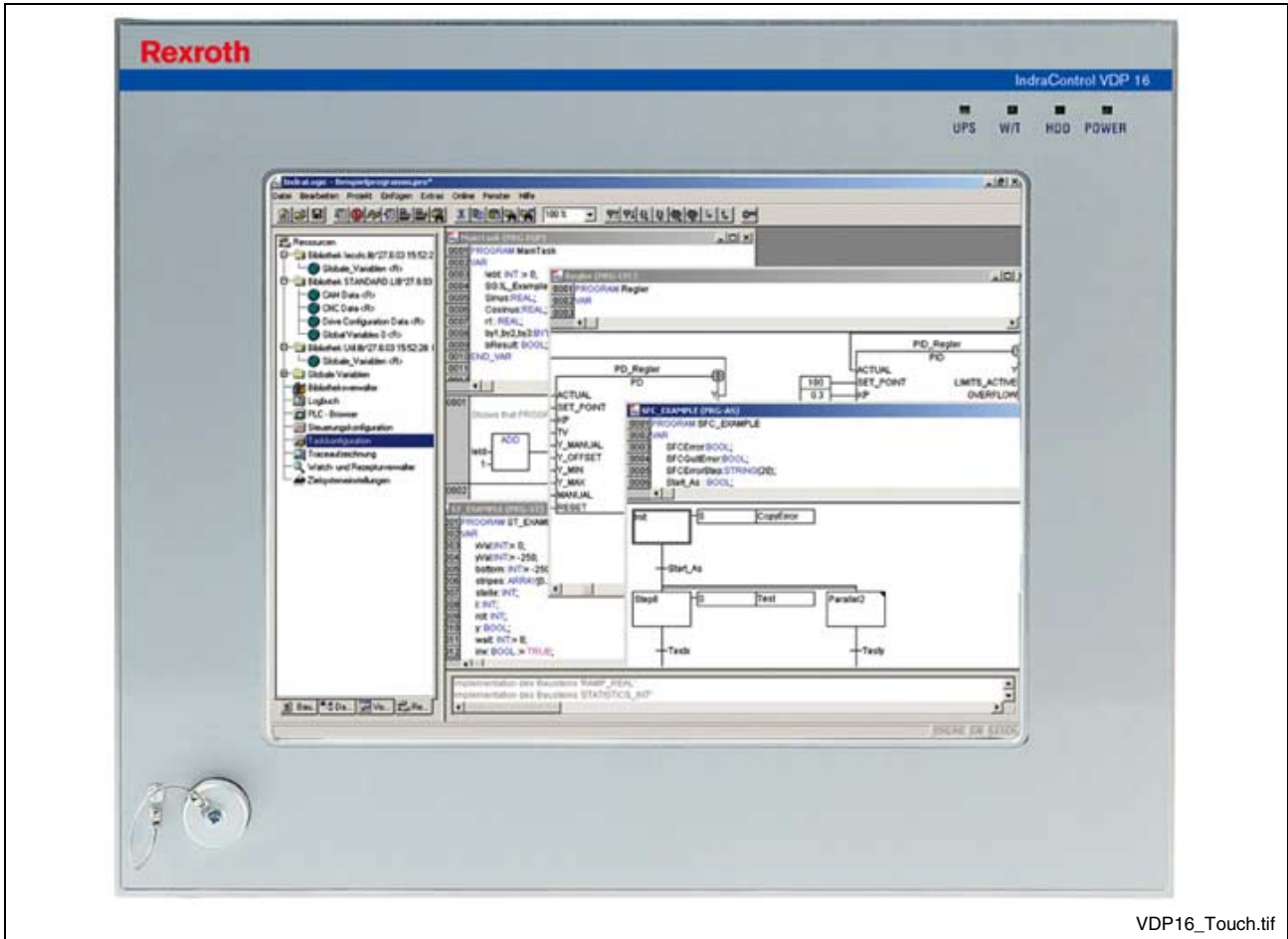
The front panel with keypad consists of a 4 mm thick aluminum panel with tapered edges covered by a chemical resistant polyester foil with embossed keys. Machine functions keys are integrated in the user-oriented functional keypad.

Displays with Touch Screen

The front panel with touch screen allows to operate the application software via the touch-sensitive surface of the display without keyboard and mouse.

Variants VDP 16.1

VDP 16.1BB with Touch Screen



VDP16_Touch.tif

Fig. 1-4: VDP 16.1 with touch screen

VDP 16.1AC with Touch Screen, Suitable for the Food Industry, without Front USB, Customer-Specific Bosch Design

These two variants are available for special applications, e.g. for the food production, with special front panel. Principally, they differ from the standard variant in its tapered edges, the missing USB connection and the different mounting dimensions.

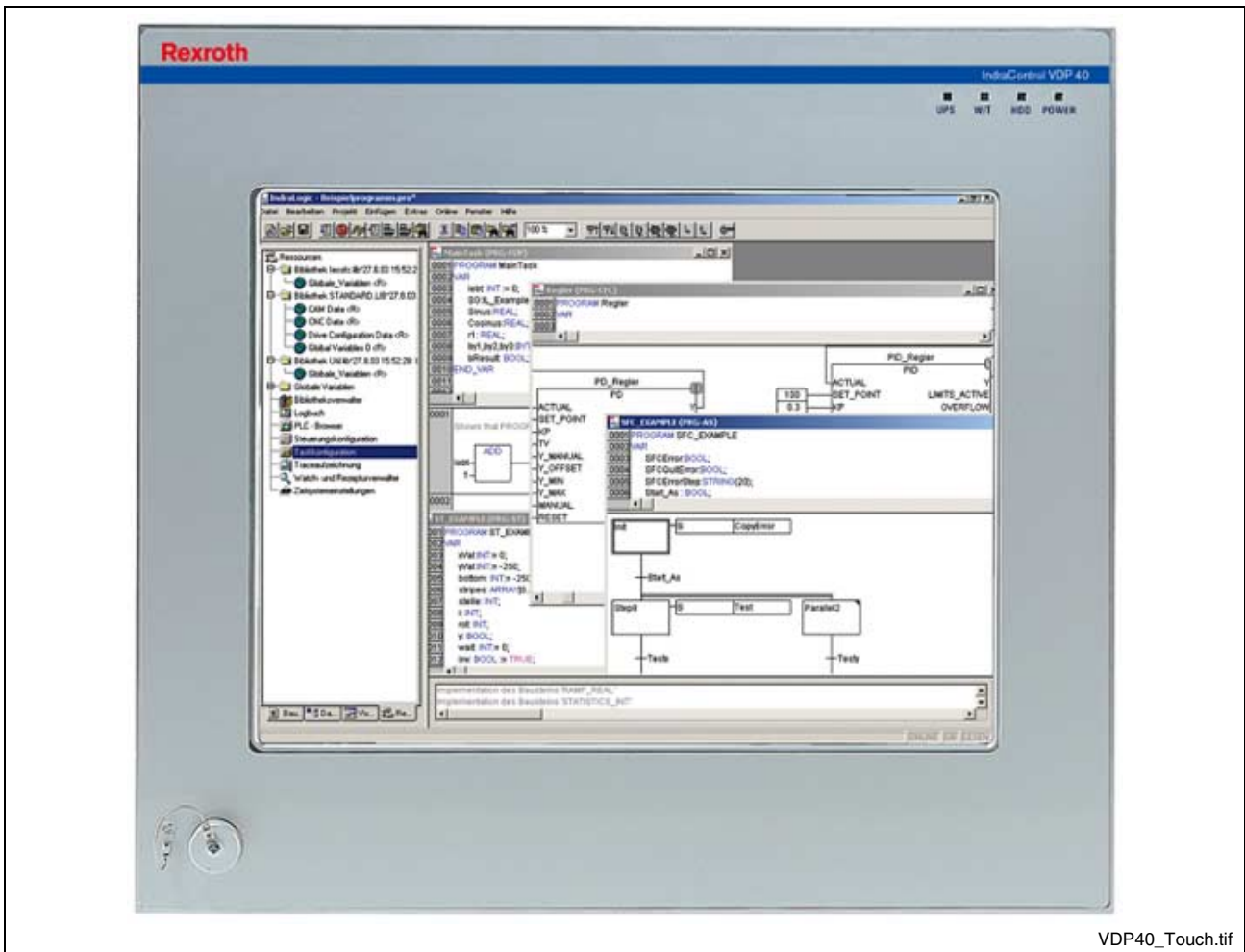
VDP 16.1BK with Keypad and 16 M-Keys, Standard Variant



Fig. 1-5: VDP 16.1 with keypad

Variants VDP 40.1

VDP 40.1BE with Touch Screen



VDP40_Touch.tif

Fig. 1-6: VDP 40.1 with touch screen

VDP 40.1AG with Touch Screen, Suitable for the Food Industry, without Front USB, Customer-Specific Bosch Design

These two variants are available for special applications, e.g. for the food production, with special front panel. Principally, they differ from the standard variant in its tapered edges, the missing USB connection and the different mounting dimensions.

VDP 40.1BI with Keypad and 16 Machine Function Keys, Standard Variant



VDP40_Tasten.tif

Fig. 1-7: VDP 40.1 with keypad

VDP 60.1

VDP 60.1BL with Keypad, 16 Machine Function Keys, Alphanumeric Keys and 12" Display



VDP_60.tif

Fig. 1-8: VDP 60.1 with keypad

1.3 Commissioning

Mount the device properly (for this, see chapter "Dimensions"). Then, connect the device to the power supply and, if required, to the network.

2 Important Directions for Use

2.1 Appropriate Use

Introduction

Bosch Rexroth products represent state-of-the-art developments and manufacturing. They are tested prior to delivery to ensure operating safety and reliability.

The products may only be used in the manner that is defined as appropriate. If they are used in an inappropriate manner, then situations can develop that may lead to property damage or injury to personnel.

Note: Bosch Rexroth, as manufacturer, is not liable for any damages resulting from inappropriate use. In such cases, the guarantee and the right to payment of damages resulting from inappropriate use are forfeited. The user alone carries all responsibility of the risks.

Before using Bosch Rexroth products, make sure that all the prerequisites for appropriate use of the products are satisfied:

- Personnel that in any way, shape or form uses our products must first read and understand the relevant safety instructions and be familiar with appropriate use.
- If the product takes the form of hardware, then they must remain in their original state, in other words, no structural changes are permitted. It is not permitted to decompile software products or alter source codes.
- Do not mount damaged or faulty products or use them in operation.
- Make sure that the products have been installed in the manner described in the relevant documentation.

Areas of Use and Application

The Displays VDP 16.1, VDP 40.1 and VDP 60.1 of Bosch Rexroth are passive operator and visualization terminals, that represent in combination with a display VDP 16.1, VDP 40.1 or VDP 60.1 a PC-based machine operator terminal.

Note: VDP 16.1, VDP 40.1 and VDP 60.1 may only be used with the accessories and parts specified in this document. If a component has not been specifically named, then it may not be either mounted or connected. The same applies to cables and lines.

Operation is only permitted in the specified configurations and combinations of components using the software and firmware as specified in the relevant function descriptions.

Typical applications of the VDP 16.1, VDP 40.1 and VDP 60.1 are:

- Handling and assembly systems,
- Packaging and foodstuff machines,
- Printing and paper processing machines
- Machine tools
- Wood working machines.

The displays VDP 16.1, VDP 40.1 and VDP 60.1 may only be operated under the assembly, installation and ambient conditions as described here (temperature, system of protection, humidity, EMC requirements, etc.) and in the position specified.

2.2 Inappropriate Use

Using the displays VDP 16.1, VDP 40.1 and VDP 60.1 outside of the above-referenced areas of application or under operating conditions other than described in the document and the technical data specified is defined as "inappropriate use".

The Displays VDP 16.1, VDP 40.1 and VDP 60.1 may not be used, if

- they are subject to operating conditions that do not meet the above specified ambient conditions. This includes, for example, operation under water, in the case of extreme temperature fluctuations or extremely high maximum temperatures or if
- Bosch Rexroth has not specifically released them for that intended purpose. Please note the specifications outlined in the general Safety Guidelines!

3 Safety Instructions for Electric Drives and Controls

3.1 Introduction

Read these instructions before the initial startup of the equipment in order to eliminate the risk of bodily harm or material damage. Follow these safety instructions at all times.

Do not attempt to install or start up this equipment without first reading all documentation provided with the product. Read and understand these safety instructions and all user documentation of the equipment prior to working with the equipment at any time. If you do not have the user documentation for your equipment, contact your local Bosch Rexroth representative to send this documentation immediately to the person or persons responsible for the safe operation of this equipment.

If the equipment is resold, rented or transferred or passed on to others, then these safety instructions must be delivered with the equipment.



WARNING

Improper use of this equipment, failure to follow the safety instructions in this document or tampering with the product, including disabling of safety devices, may result in material damage, bodily harm, electric shock or even death!

3.2 Explanations

The safety instructions describe the following degrees of hazard seriousness in compliance with ANSI Z535. The degree of hazard seriousness informs about the consequences resulting from non-compliance with the safety instructions.

Warning symbol with signal word	Degree of hazard seriousness according to ANSI
 DANGER	Death or severe bodily harm will occur.
 WARNING	Death or severe bodily harm may occur.
 CAUTION	Bodily harm or material damage may occur.

Fig. 3-1: Hazard classification (according to ANSI Z535)

3.3 Hazards by Improper Use



DANGER

**High voltage and high discharge current!
Danger to life or severe bodily harm by electric shock!**



DANGER

Dangerous movements! Danger to life, severe bodily harm or material damage by unintentional motor movements!



WARNING

High electrical voltage due to wrong connections! Danger to life or bodily harm by electric shock!



WARNING

Health hazard for persons with heart pacemakers, metal implants and hearing aids in proximity to electrical equipment!



CAUTION

Surface of machine housing could be extremely hot! Danger of injury! Danger of burns!



CAUTION

Risk of injury due to improper handling! Bodily harm caused by crushing, shearing, cutting and mechanical shock or incorrect handling of pressurized systems!



CAUTION

Risk of injury due to incorrect handling of batteries!

3.4 General Information

- Bosch Rexroth AG is not liable for damages resulting from failure to observe the warnings provided in this documentation.
- Read the operating, maintenance and safety instructions in your language before starting up the machine. If you find that you cannot completely understand the documentation for your product, please ask your supplier to clarify.
- Proper and correct transport, storage, assembly and installation as well as care in operation and maintenance are prerequisites for optimal and safe operation of this equipment.
- Only persons who are trained and qualified for the use and operation of the equipment may work on this equipment or within its proximity.
 - The persons are qualified if they have sufficient knowledge of the assembly, installation and operation of the equipment as well as an understanding of all warnings and precautionary measures noted in these instructions.
 - Furthermore, they must be trained, instructed and qualified to switch electrical circuits and equipment on and off in accordance with technical safety regulations, to ground them and to mark them according to the requirements of safe work practices. They must have adequate safety equipment and be trained in first aid.
- Only use spare parts and accessories approved by the manufacturer.
- Follow all safety regulations and requirements for the specific application as practiced in the country of use.
- The equipment is designed for installation in industrial machinery.
- The ambient conditions given in the product documentation must be observed.
- Use only safety features and applications that are clearly and explicitly approved in the Project Planning Manual. If this is not the case, they are excluded.

The following areas of use and application, for example, include safety features and applications: construction cranes, elevators used for people or freight, devices and vehicles to transport people, medical applications, refinery plants, transport of hazardous goods, nuclear applications, applications in which electrical devices with vital functions can be electromagnetically disturbed, mining, food processing, control of protection equipment (also in a machine).
- The information given in the documentation of the product with regard to the use of the delivered components contains only examples of applications and suggestions.

The machine and installation manufacturer must

 - make sure that the delivered components are suited for his individual application and check the information given in this documentation with regard to the use of the components,
 - make sure that his application complies with the applicable safety regulations and standards and carry out the required measures, modifications and complements.
- Startup of the delivered components is only permitted once it is sure that the machine or installation in which they are installed complies with the national regulations, safety specifications and standards of the application.
- Technical data, connections and operational conditions are specified in the product documentation and must be followed at all times.

- Operation is only permitted if the national EMC regulations for the application are met.
The instructions for installation in accordance with EMC requirements can be found in the documentation "EMC in Drive and Control Systems".
The machine or installation manufacturer is responsible for compliance with the limiting values as prescribed in the national regulations.

3.5 Protection Against Contact with Electrical Parts

Note: This section refers to equipment and drive components with voltages above 50 Volts.

Touching live parts with voltages of 50 Volts and more with bare hands or conductive tools or touching ungrounded housings can be dangerous and cause electric shock. In order to operate electrical equipment, certain parts must unavoidably have dangerous voltages applied to them.



DANGER

High electrical voltage! Danger to life, severe bodily harm by electric shock!

- ⇒ Only those trained and qualified to work with or on electrical equipment are permitted to operate, maintain or repair this equipment.
 - ⇒ Follow general construction and safety regulations when working on high voltage installations.
 - ⇒ Before switching on power the ground wire must be permanently connected to all electrical units according to the connection diagram.
 - ⇒ Do not operate electrical equipment at any time, even for brief measurements or tests, if the ground wire is not permanently connected to the points of the components provided for this purpose.
 - ⇒ Before working with electrical parts with voltage higher than 50 V, the equipment must be disconnected from the mains voltage or power supply. Make sure the equipment cannot be switched on again unintended.
 - ⇒ The following should be observed with electrical drive and filter components:
 - ⇒ Wait thirty (30) minutes after switching off power to allow capacitors to discharge before beginning to work. Measure the voltage on the capacitors before beginning to work to make sure that the equipment is safe to touch.
 - ⇒ Never touch the electrical connection points of a component while power is turned on.
 - ⇒ Install the covers and guards provided with the equipment properly before switching the equipment on. Prevent contact with live parts at any time.
 - ⇒ A residual-current-operated protective device (RCD) must not be used on electric drives! Indirect contact must be prevented by other means, for example, by an overcurrent protective device.
 - ⇒ Electrical components with exposed live parts and uncovered high voltage terminals must be installed in a protective housing, for example, in a control cabinet.
-

To be observed with electrical drive and filter components:



DANGER

**High electrical voltage on the housing!
High leakage current! Danger to life, danger of
injury by electric shock!**

- ⇒ Connect the electrical equipment, the housings of all electrical units and motors permanently with the safety conductor at the ground points before power is switched on. Look at the connection diagram. This is even necessary for brief tests.
- ⇒ Connect the safety conductor of the electrical equipment always permanently and firmly to the supply mains. Leakage current exceeds 3.5 mA in normal operation.
- ⇒ Use a copper conductor with at least 10 mm² cross section over its entire course for this safety conductor connection!
- ⇒ Prior to startups, even for brief tests, always connect the protective conductor or connect with ground wire. Otherwise, high voltages can occur on the housing that lead to electric shock.

3.6 Protection Against Electric Shock by Protective Low Voltage (PELV)

All connections and terminals with voltages between 0 and 50 Volts on Rexroth products are protective low voltages designed in accordance with international standards on electrical safety.



WARNING

**High electrical voltage due to wrong
connections! Danger to life, bodily harm by
electric shock!**

- ⇒ Only connect equipment, electrical components and cables of the protective low voltage type (PELV = Protective Extra Low Voltage) to all terminals and clamps with voltages of 0 to 50 Volts.
- ⇒ Only electrical circuits may be connected which are safely isolated against high voltage circuits. Safe isolation is achieved, for example, with an isolating transformer, an opto-electronic coupler or when battery-operated.

3.7 Protection Against Dangerous Movements

Dangerous movements can be caused by faulty control of the connected motors. Some common examples are:

- improper or wrong wiring of cable connections
- incorrect operation of the equipment components
- wrong input of parameters before operation
- malfunction of sensors, encoders and monitoring devices
- defective components
- software or firmware errors

Dangerous movements can occur immediately after equipment is switched on or even after an unspecified time of trouble-free operation.

The monitoring in the drive components will normally be sufficient to avoid faulty operation in the connected drives. Regarding personal safety, especially the danger of bodily injury and material damage, this alone cannot be relied upon to ensure complete safety. Until the integrated monitoring functions become effective, it must be assumed in any case that faulty drive movements will occur. The extent of faulty drive movements depends upon the type of control and the state of operation.



Dangerous movements! Danger to life, risk of injury, severe bodily harm or material damage!

- ⇒ Ensure personal safety by means of qualified and tested higher-level monitoring devices or measures integrated in the installation. Unintended machine motion is possible if monitoring devices are disabled, bypassed or not activated.
- ⇒ Pay attention to unintended machine motion or other malfunction in any mode of operation.
- ⇒ Keep free and clear of the machine's range of motion and moving parts. Possible measures to prevent people from accidentally entering the machine's range of motion:
 - use safety fences
 - use safety guards
 - use protective coverings
 - install light curtains or light barriers
- ⇒ Fences and coverings must be strong enough to resist maximum possible momentum, especially if there is a possibility of loose parts flying off.
- ⇒ Mount the emergency stop switch in the immediate reach of the operator. Verify that the emergency stop works before startup. Don't operate the machine if the emergency stop is not working.
- ⇒ Isolate the drive power connection by means of an emergency stop circuit or use a starting lockout to prevent unintentional start.
- ⇒ Make sure that the drives are brought to a safe standstill before accessing or entering the danger zone. Safe standstill can be achieved by switching off the power supply contactor or by safe mechanical locking of moving parts.

- ⇒ Secure vertical axes against falling or dropping after switching off the motor power by, for example:
 - mechanically securing the vertical axes
 - adding an external braking/ arrester/ clamping mechanism
 - ensuring sufficient equilibration of the vertical axes
 The standard equipment motor brake or an external brake controlled directly by the drive controller are not sufficient to guarantee personal safety!
- ⇒ Disconnect electrical power to the equipment using a master switch and secure the switch against reconnection for:
 - maintenance and repair work
 - cleaning of equipment
 - long periods of discontinued equipment use
- ⇒ Prevent the operation of high-frequency, remote control and radio equipment near electronics circuits and supply leads. If the use of such equipment cannot be avoided, verify the system and the installation for possible malfunctions in all possible positions of normal use before initial startup. If necessary, perform a special electromagnetic compatibility (EMC) test on the installation.

3.8 Protection Against Magnetic and Electromagnetic Fields During Operation and Mounting

Magnetic and electromagnetic fields generated near current-carrying conductors and permanent magnets in motors represent a serious health hazard to persons with heart pacemakers, metal implants and hearing aids.



WARNING

Health hazard for persons with heart pacemakers, metal implants and hearing aids in proximity to electrical equipment!

- ⇒ Persons with heart pacemakers, hearing aids and metal implants are not permitted to enter the following areas:
 - Areas in which electrical equipment and parts are mounted, being operated or started up.
 - Areas in which parts of motors with permanent magnets are being stored, operated, repaired or mounted.
- ⇒ If it is necessary for a person with a heart pacemaker to enter such an area, then a doctor must be consulted prior to doing so. Heart pacemakers that are already implanted or will be implanted in the future, have a considerable variation in their electrical noise immunity. Therefore there are no rules with general validity.
- ⇒ Persons with hearing aids, metal implants or metal pieces must consult a doctor before they enter the areas described above. Otherwise, health hazards will occur.

3.9 Protection Against Contact with Hot Parts



CAUTION

**Housing surfaces could be extremely hot!
Danger of injury! Danger of burns!**

- ⇒ Do not touch housing surfaces near sources of heat! Danger of burns!
 - ⇒ After switching the equipment off, wait at least ten (10) minutes to allow it to cool down before touching it.
 - ⇒ Do not touch hot parts of the equipment, such as housings with integrated heat sinks and resistors. Danger of burns!
-

3.10 Protection During Handling and Mounting

Under certain conditions, incorrect handling and mounting of parts and components may cause injuries.



CAUTION

Risk of injury by incorrect handling! Bodily harm caused by crushing, shearing, cutting and mechanical shock!

- ⇒ Observe general installation and safety instructions with regard to handling and mounting.
 - ⇒ Use appropriate mounting and transport equipment.
 - ⇒ Take precautions to avoid pinching and crushing.
 - ⇒ Use only appropriate tools. If specified by the product documentation, special tools must be used.
 - ⇒ Use lifting devices and tools correctly and safely.
 - ⇒ For safe protection wear appropriate protective clothing, e.g. safety glasses, safety shoes and safety gloves.
 - ⇒ Never stand under suspended loads.
 - ⇒ Clean up liquids from the floor immediately to prevent slipping.
-

3.11 Battery Safety

Batteries contain reactive chemicals in a solid housing. Inappropriate handling may result in injuries or material damage.



CAUTION

Risk of injury by incorrect handling!

- ⇒ Do not attempt to reactivate discharged batteries by heating or other methods (danger of explosion and cauterization).
- ⇒ Never charge non-chargeable batteries (danger of leakage and explosion).
- ⇒ Never throw batteries into a fire.
- ⇒ Do not dismantle batteries.
- ⇒ Do not damage electrical components installed in the equipment.

Note: Be aware of environmental protection and disposal! The batteries contained in the product should be considered as hazardous material for land, air and sea transport in the sense of the legal requirements (danger of explosion). Dispose batteries separately from other waste. Observe the legal requirements in the country of installation.

3.12 Protection Against Pressurized Systems

Certain motors and drive controllers, corresponding to the information in the respective Project Planning Manual, must be provided with pressurized media, such as compressed air, hydraulic oil, cooling fluid and cooling lubricant supplied by external systems. Incorrect handling of the supply and connections of pressurized systems can lead to injuries or accidents. In these cases, improper handling of external supply systems, supply lines or connections can cause injuries or material damage.



CAUTION

Danger of injury by incorrect handling of pressurized systems !

- ⇒ Do not attempt to disassemble, to open or to cut a pressurized system (danger of explosion).
- ⇒ Observe the operation instructions of the respective manufacturer.
- ⇒ Before disassembling pressurized systems, release pressure and drain off the fluid or gas.
- ⇒ Use suitable protective clothing (for example safety glasses, safety shoes and safety gloves)
- ⇒ Remove any fluid that has leaked out onto the floor immediately.

Note: Environmental protection and disposal! The media used in the operation of the pressurized system equipment may not be environmentally compatible. Media that are damaging the environment must be disposed separately from normal waste. Observe the legal requirements in the country of installation.

Notes

4 Technical Data

4.1 Front Panel

	VDP 16.1BB	VDP 16.1AC	VDP 16.1BK
Display	12"-TFT, 800 x 600 pixel 256.000 colors		
Operation	Touch screen		Keypad
Surface – Front panel	Color: RAL 7035 light gray	Graphite gray (Bosch design)	Color: RAL 7035 light gray
Degree of protection	Front panel IP 65 according to DIN 40 050, IEC 529		
Interface	USB connection, cover's degree of protection IP 65	No USB connection	USB connection, cover's degree of protection IP 65

Fig. 4-1: Technical data: front VDP 16.1

	VDP 40.1BE	VDP 40.1AG	VDP 40.1BI
Display	15"-TFT, 1024 x 768 pixel 256.000 colors		
Operation	Touch screen		Keypad
Surface – Front panel	Color: RAL 7035 light gray	Graphite gray (Bosch design)	Color: RAL 7035 light gray
Degree of protection	Front panel IP 65 according to DIN 40 050, IEC 529		
Interface	USB connection, cover's degree of protection IP 65	No USB connection	USB connection, cover's degree of protection IP 65

Fig. 4-2: Technical data: front VDP 40.1

	VDP 60.1BL
Display	12"-TFT, 800 x 600 pixel 256.000 colors
Operation	Keypad
Surface – Front panel	Color: RAL 7035 light gray
Degree of protection	Front panel IP 65 according to DIN 40 050, IEC 529
Interface	USB connection, cover's degree of protection IP 65

Fig. 4-3: Technical data: front VDP 60.1

4.2 Power Supply

The VDP is provided by the IPC via the GIGASTAR interface with a voltage of 24 VDC. The maximum power consumption is 2 A.

Only if a Y-Repeater is used, the VDP has to be separately provided with a voltage of 24 VDC (see chapter "24 VDC Power Supply on page 7-2).

4.3 Ambient Conditions

	Operation	Storage/transport
Max. ambient temperature (surrounding air temperature)	+5 °C... +45 °C	-20 °C to +60 °C
Max. temperature gradient	Temporal temperature changes up to 3 °C per minute	Not defined
Relative humidity	Climatic class 3K3 according to EN 60721, condensation not permissible.	Climatic class 3K3 according to EN 60721, condensation not permissible.
Air pressure	Up to 2,000 m above MSL according to DIN 60204	
Mechanical strength	Max. vibration: Frequency range: 10 ... 150 Hz Excursion: 0.075 mm for 10 ... 57 Hz Acceleration: 1 g for 57 ... 150 Hz According to EN 60068-2-6	Max. shock: 15 g according to DIN IEC 68-2-27, no disturbance of the function

Fig. 4-4: Ambient conditions

4.4 Used Standards

The system components of the displays correspond to the following standards:

EN Standards

Standard	Meaning
EN 60 204-1	Electrical equipment of machines
EN 50 081-2	Basic technical standard, emitted interference (industrial environment)
EN 50 082-2	Basic technical standard, noise immunity (industrial environment)
EN 60 742	Transformer for 24 V power supply unit, protective separation
EN 60 950	Overvoltage category II
EN 61 131	Requirements concerning the 24 V outputs
EN 61 131-2	Requirements concerning the 24 power supply
EN 418	Machine safety, EMERGENCY STOP devices
EN 60 529	Degrees of protection (incl. housings and installation compartments)
EN 60 068-2-6	Vibration test
EN 60068-2-27	Shock test

Fig. 4-5: Used standards

CE Marking

Note: Concerning delivered VDP displays all CE requirements are fulfilled.

UL/CSA Certification The devices of the VDP family are basically certificated according to



- **UL508** (Industrial Control Equipment) and
- **C22.2 No. 14-M95** (CSA)

However, it is possible that there are combinations or extension stages with restricted or missing certification. Thus, verify the registration according to the UL marking on the device.

Note: To guarantee an UL/CSA-compliant operation, you have to fulfill the following conditions:

- Use 60/75 °C copper wire only.
- Use Class 1 wire only or equivalent.

4.5 Wear Parts

Wear parts without warranty

The service life of the **backlight** is limited to a certain number of operating hours. After this time the backlight will produce only 50 % of its original brightness. This time differs for the used displays:

Display seize	Service life
12"	40,000 hours
15"	35,000 hours

Fig. 4-6: Service life of the backlight

- Also **fans** are mechanic wear components, whose service life is extremely temperature-dependent. For the fan the manufacturer specifies the following service life:

Ambient temperature (surrounding air temperature)	Service life
20 °C	45,000 hours
60 °C	15,000 hours

Fig. 4-7: Service life of the fan

4.6 Compatibility Test

All Rexroth controls and drives are developed and tested according to the latest state-of-the-art.

As it is impossible to follow the continuing development of all materials (e.g. lubricants in machine tools) which may interact with our controls and drives, it cannot be completely ruled out that any reactions with the materials used by Bosch Rexroth might occur.

For that reason, test new lubricants, cleaning agents, etc. for compatibility with our housings / our housing materials before using the particular material concerned.

5 Dimensions

5.1 Dimensions of the VDP Displays

Housing Dimensions VDP 16.1

Independent of the design of the VDP 16.1 standard variants with M-Keys or touch screen the front panel width is 350 mm and the height is 290 mm.

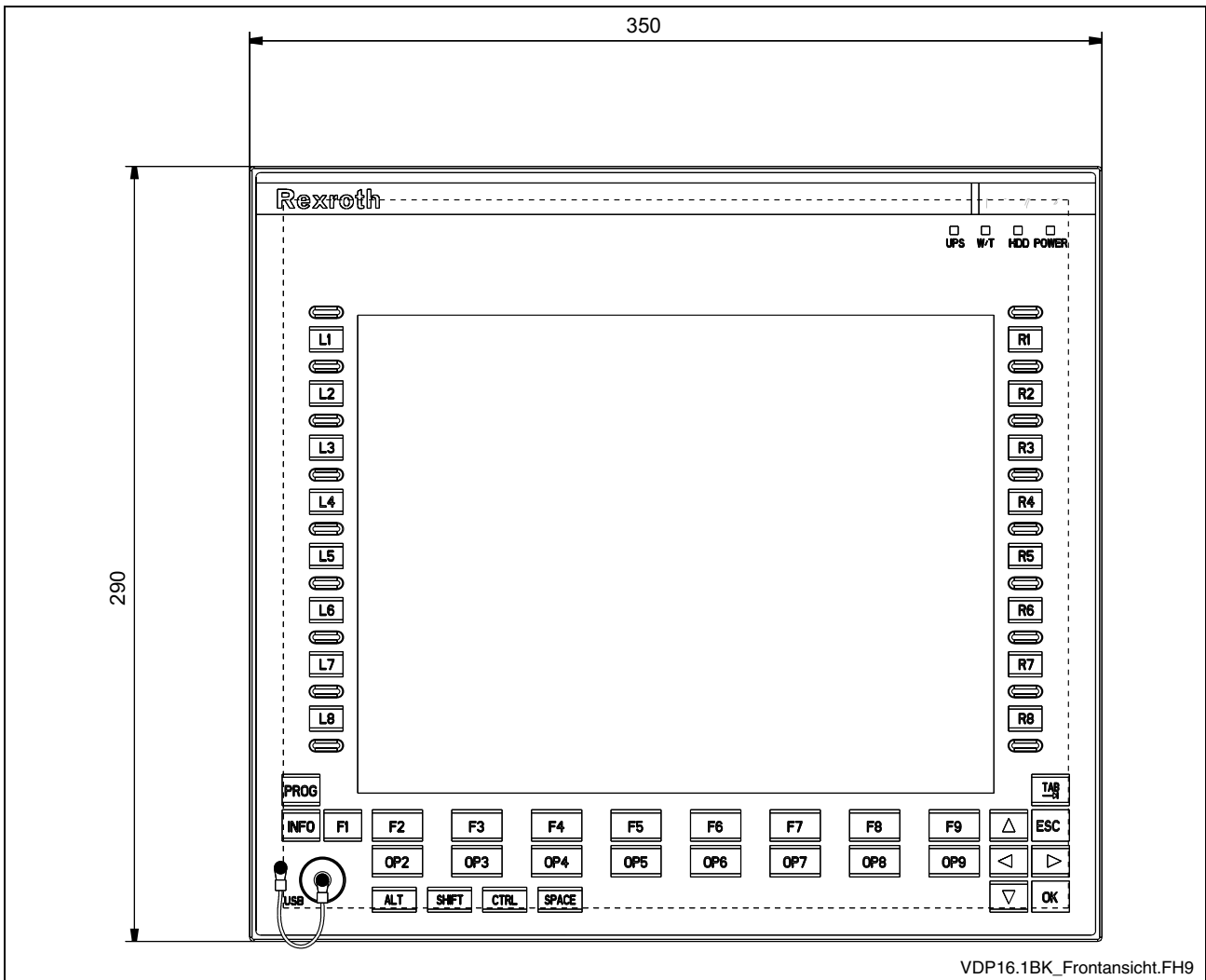


Fig. 5-1: Dimensions – Front panel VDP 16.1BK

The front panel of the VDP 16.1BB with touch screen has the same dimensions.

The front panel width of the VDP 16.1 for the food industry is 360 mm and the height is 300 mm.

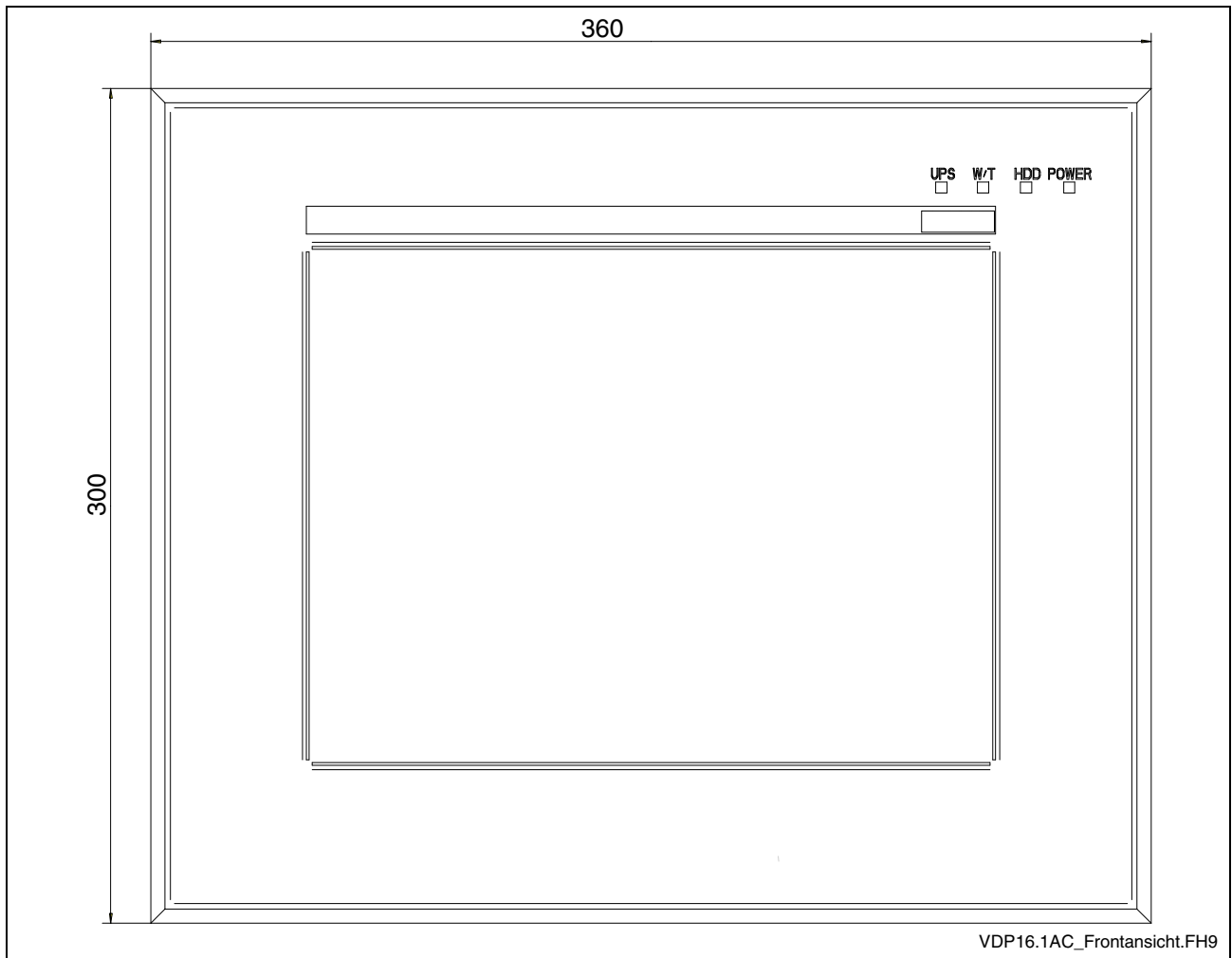


Fig. 5-2: Dimensions – Front panel VDP 16.1AC

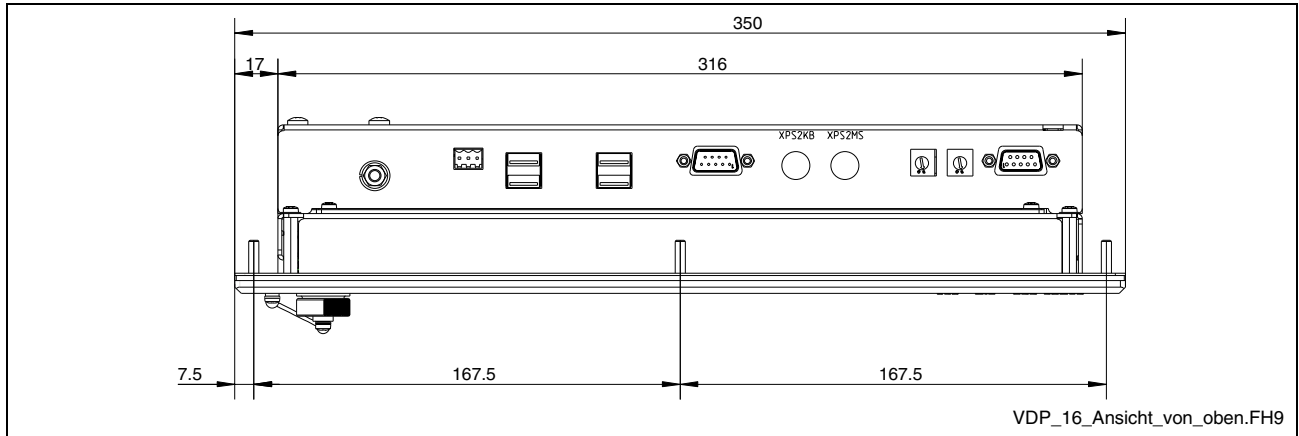


Fig. 5-3: VDP 16.1BB and VDP 16.1BK – Bottom view

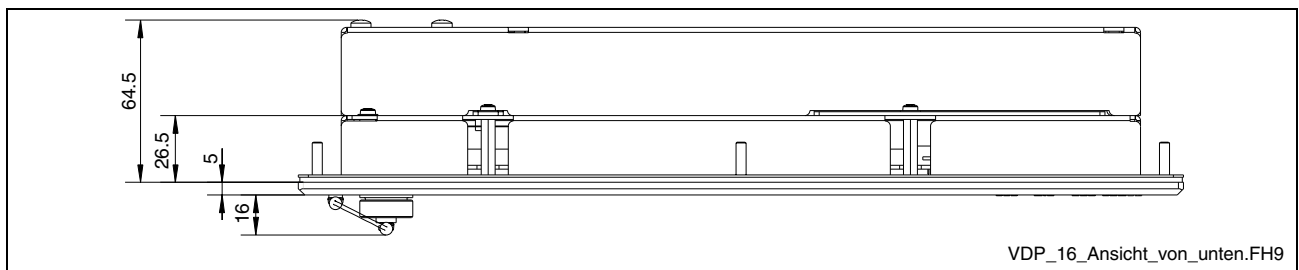


Fig. 5-4: VDP 16.1BB and VDP 16.1BK – Bottom view

	VDP 16.1BB + BK	VDP 16.1AC
Width	350 mm	360 mm
Height	290 mm	300 mm
Installation depth	64.5 mm	

Fig. 5-5: Dimensions VDP 16.1

Housing Dimensions VDP 40.1

Independent of the design of the VDP 40.1 standard variants with M-Keys or touch screen the front panel width is 407 mm and the height is 370 mm.

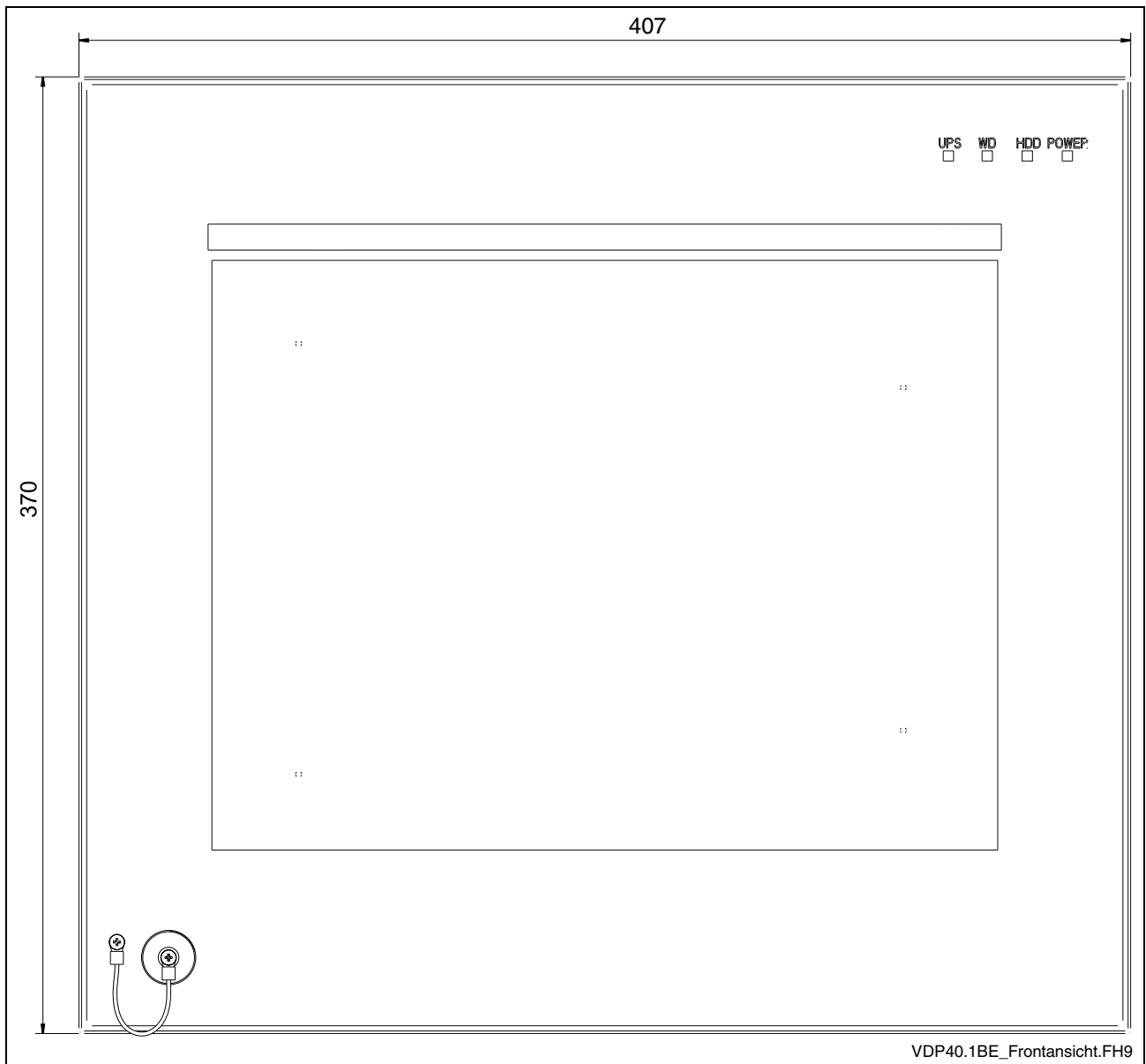


Fig. 5-6: Dimensions – Front panel VDP 40.1BE and VDP 40.1BI

The front panel width of the VDP 40.1 for the food industry is 417 mm and the height is 380 mm.

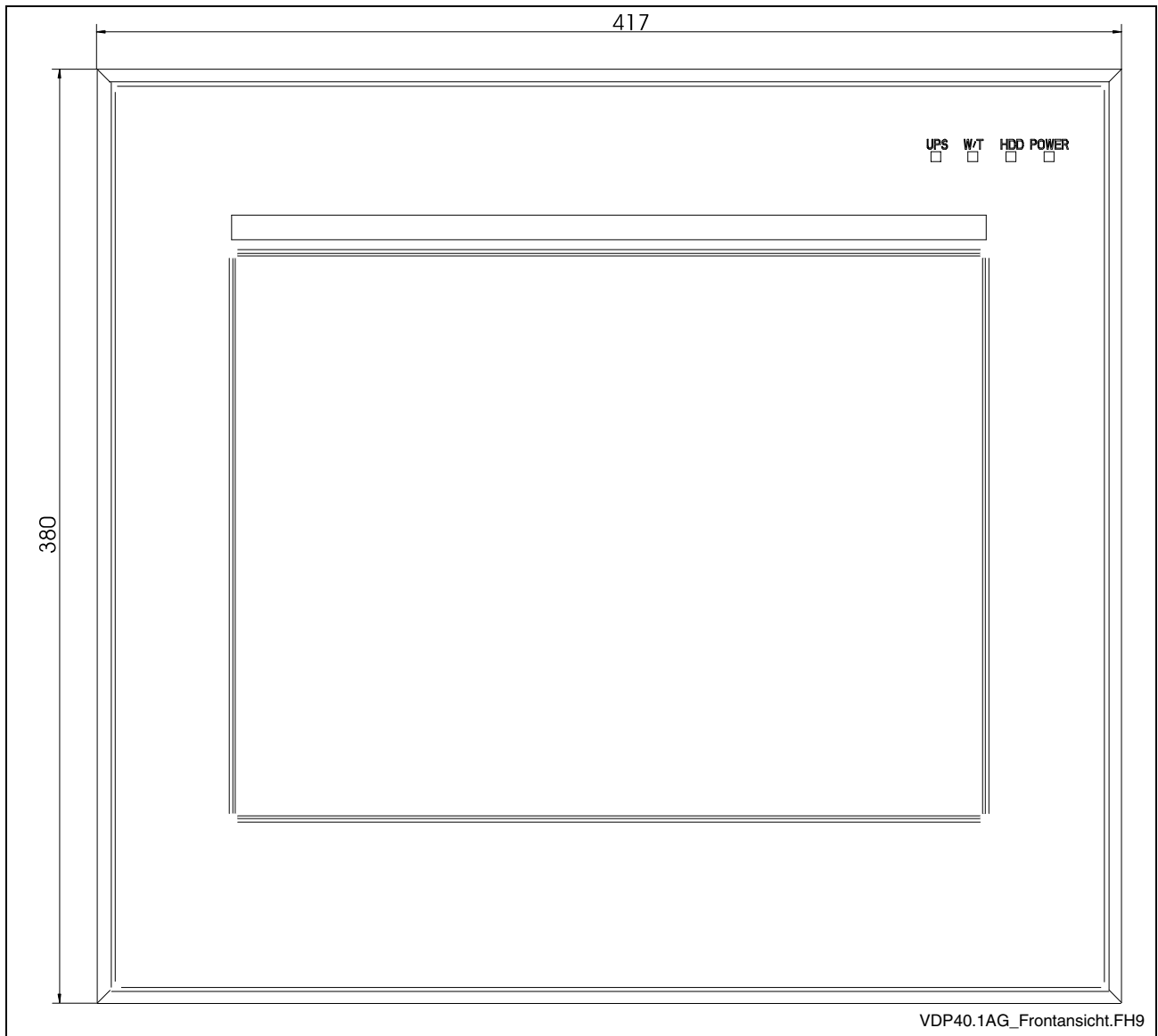


Fig. 5-7: Dimensions – Front panel VDP 40.1AG

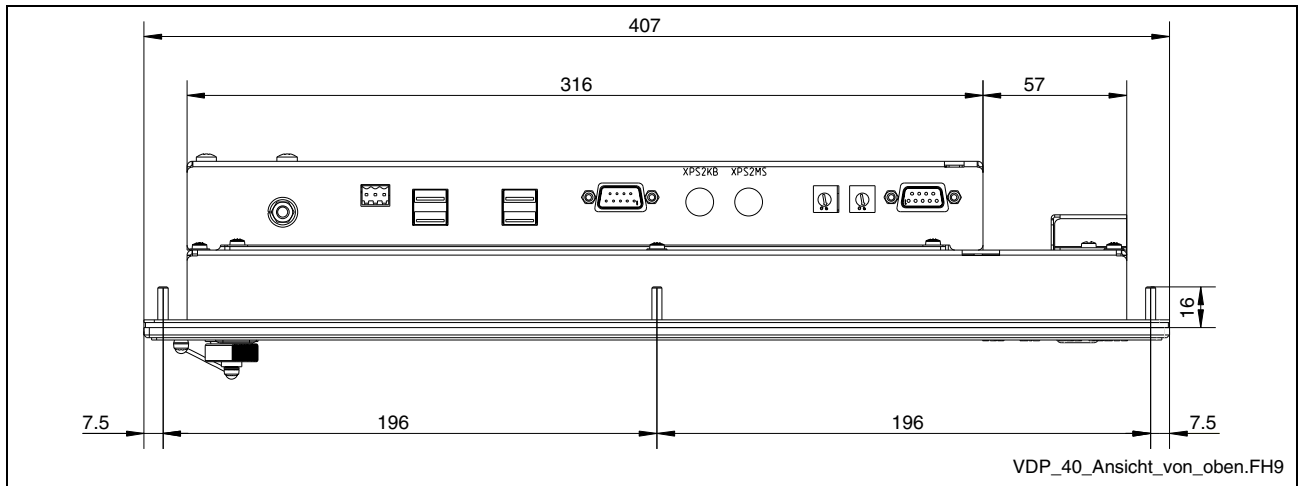


Fig. 5-8: VDP 40.1BE and VDP 40.1BI – Bottom view

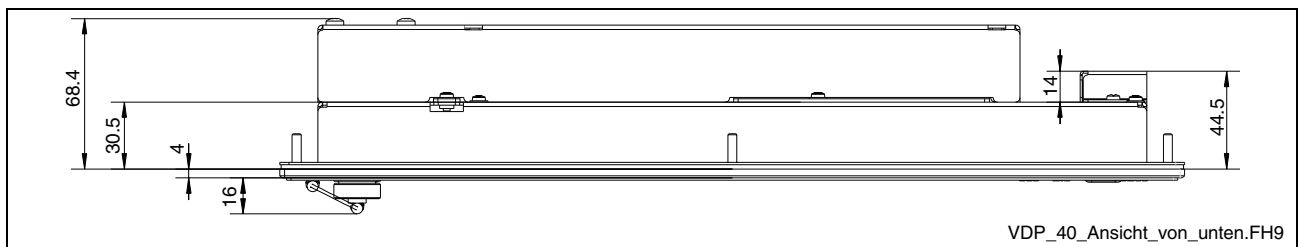


Fig. 5-9: VDP 40.1BE and VDP 40.1BI – Bottom view

	VDP 40.1BE + BI	VDP 16.1AG
Width	407 mm	417 mm
Height	370 mm	380 mm
Installation depth	68.4 mm	

Fig. 5-10: Dimensions VDP 40.1

Housing Dimensions VDP 60.1

The front panel width of the display VDP 60.2BL is 483 (19") mm and the height is 266 mm.

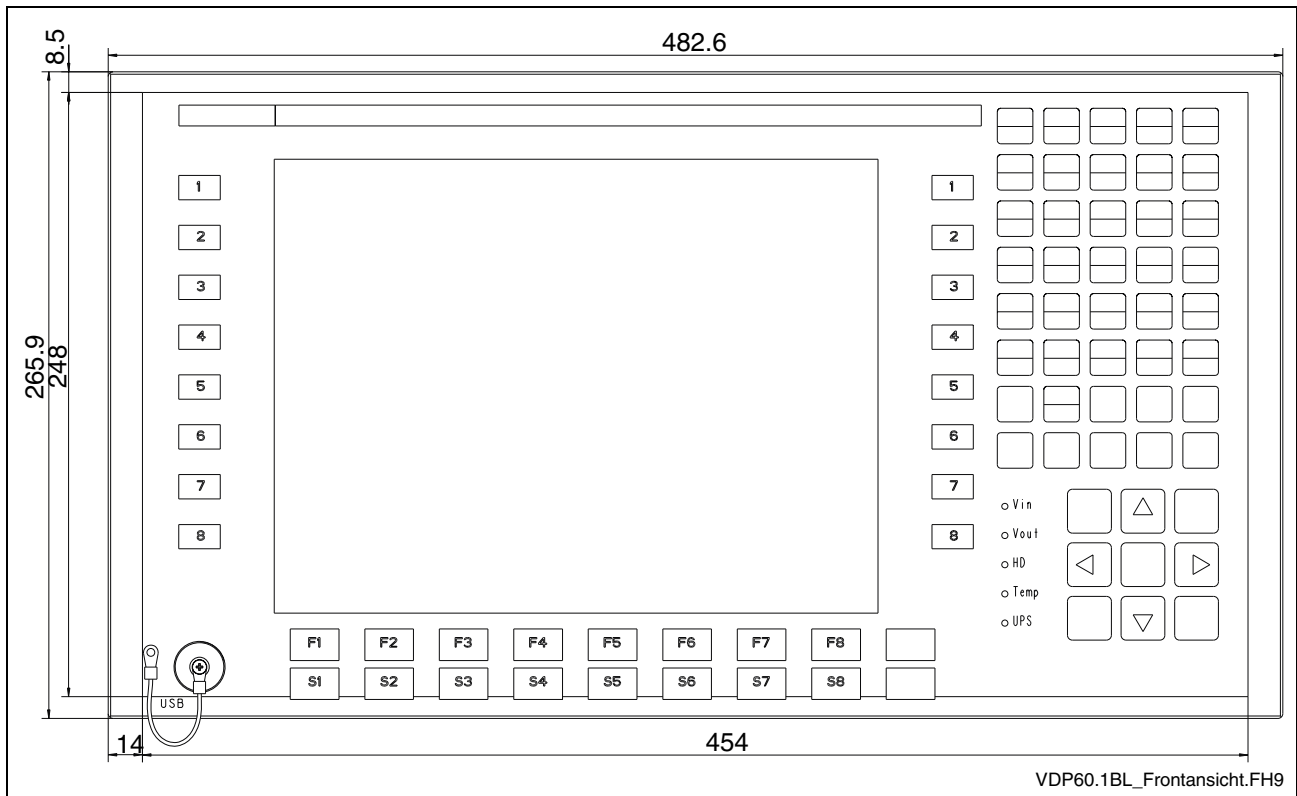


Fig. 5-11: Dimensions – Front panel VDP 60.1BL

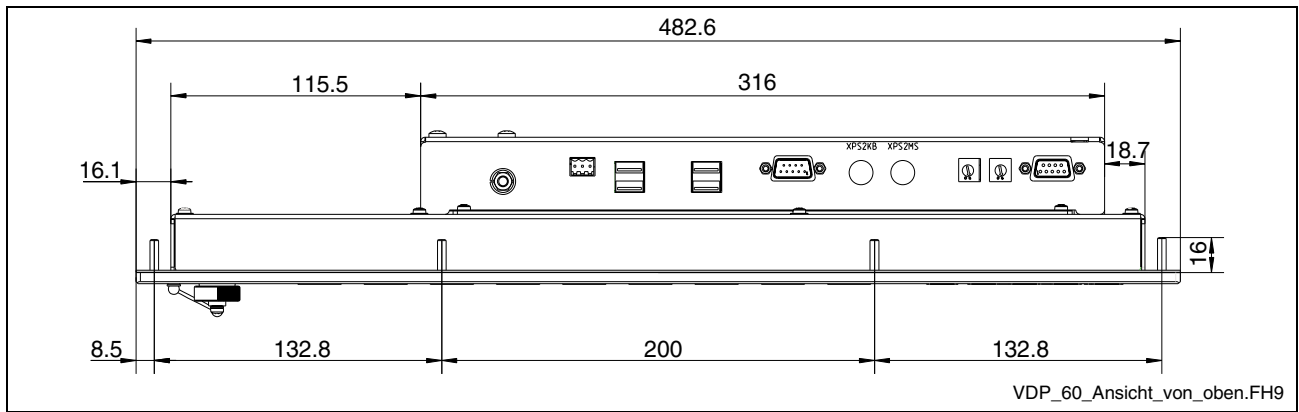


Fig. 5-12: VDP 60.1BL – Bottom view

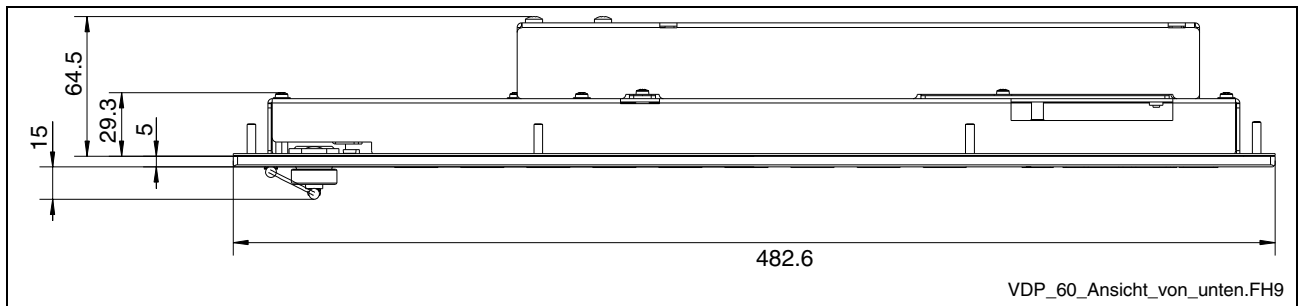


Fig. 5-13: VDP 60.1BL – Bottom view

	VDP 60.1BK
Width	483 mm
Height	266 mm
Installation depth	64.5 mm

Fig. 5-14: Dimensions VDP 60.1

5.2 Housing Dimensions of the Y-Repeater

The Y-Repeater is provided for rear panel mounting as well as for mounting on a mounting rail.

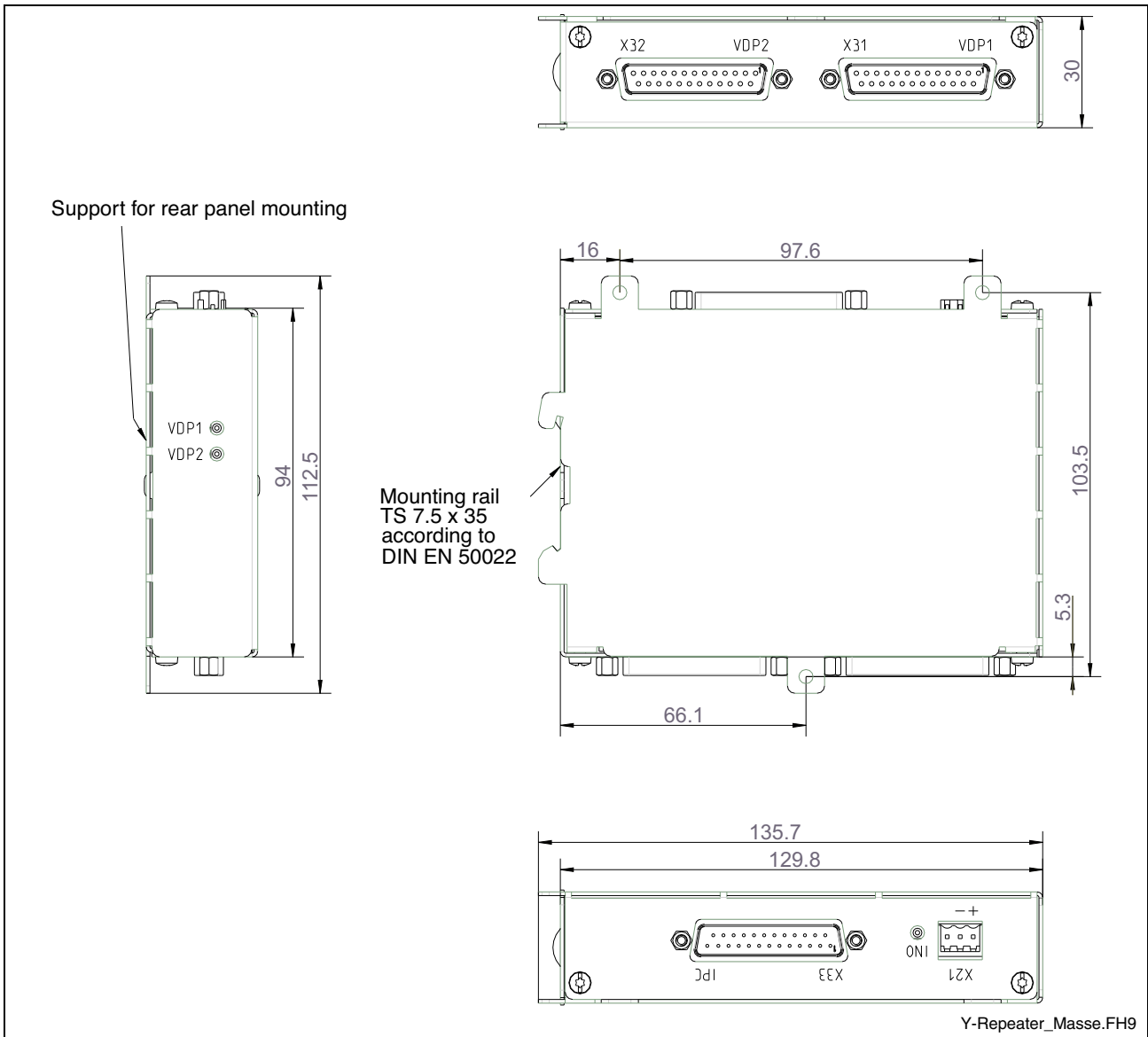


Fig. 5-15: Dimensions of the Y-Repeater

5.3 Installation

Installation Notes

- When installing the display observe to ensure an ergonomic operation. Additionally, ensure that all moving machine components are in sight of the operator.
- Avoid installation locations exposed to direct sunlight, as the screen readability is reduced and additional heat development can occur.
- Observe that the LED displays on the front panel are not obstructed.
- Lay all connecting cables in loops and use strain reliefs for all cables.
- Keep a suitably large distance from sources of interference.

Mounting Cut-Out

For mounting the display proceed as follows:



DANGER

Loss of degree of protection IP 65!

The front panels of the VDP devices correspond to degree of protection IP 65. To ensure that this degree of protection also remains preserved in the mounted status, you have to take appropriate measures:

- ⇒ Remove – as mentioned below – immediately before mounting the device the paper strip from the seal at the rear side of the front panel.
- ⇒ Further required measures are to be taken depending on the mounting location, e.g. the stabilization of the mounting frame.

-
1. Create a mounting cut-out with 8 holes, diameter 5 mm, according to the illustrations "Mounting dimensions" on the following page.
 2. Remove the paper strip from the seal at the rear side of the front panel.
 3. Insert the display from the front into the cut-out. Then insert the mounting bolts M4 into the drilled holes.
 4. Fasten the display by screwing the nuts at the rear side of the mounting bolts.

Mounting Dimensions VDP 16.1

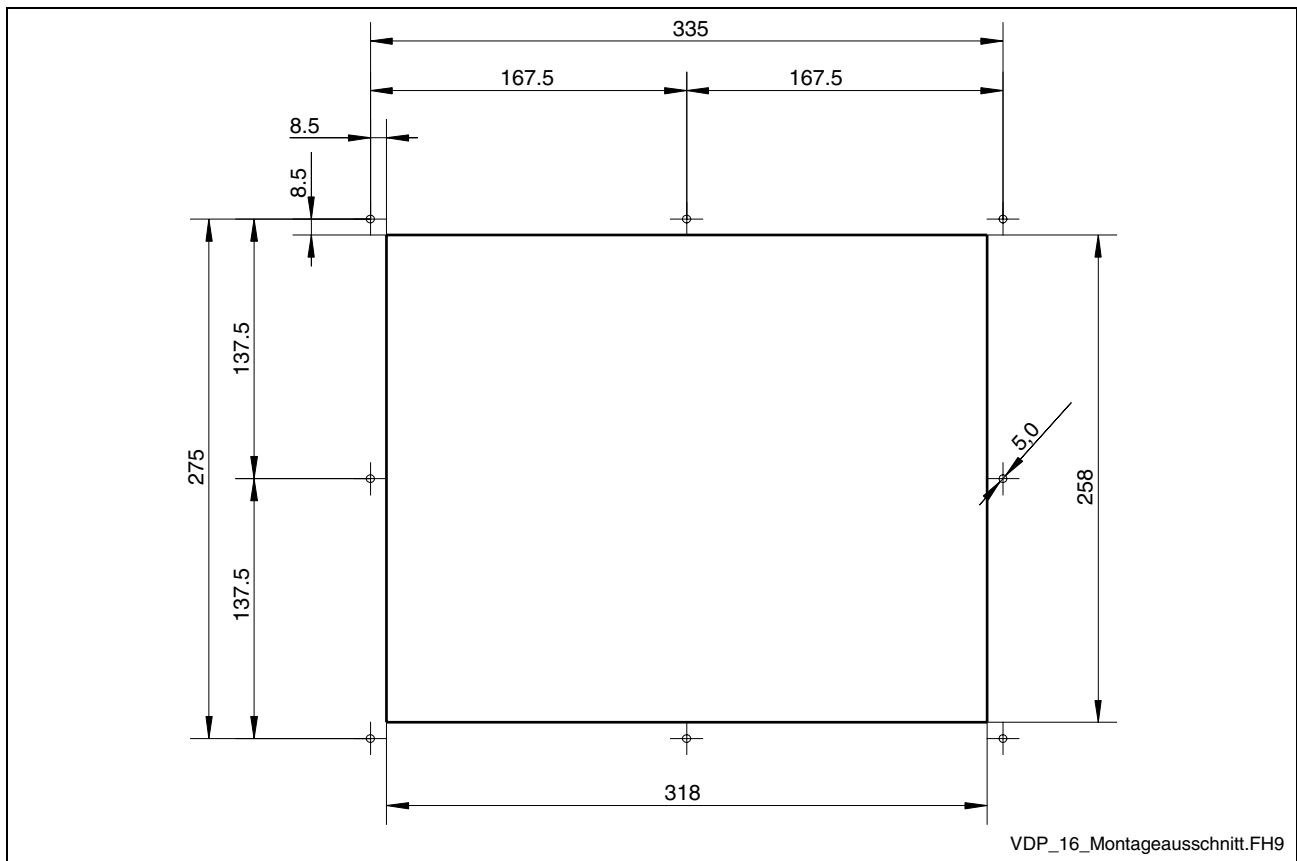


Fig. 5-16: Mounting dimensions VDP 16.1

Mounting Dimensions VDP 40.1

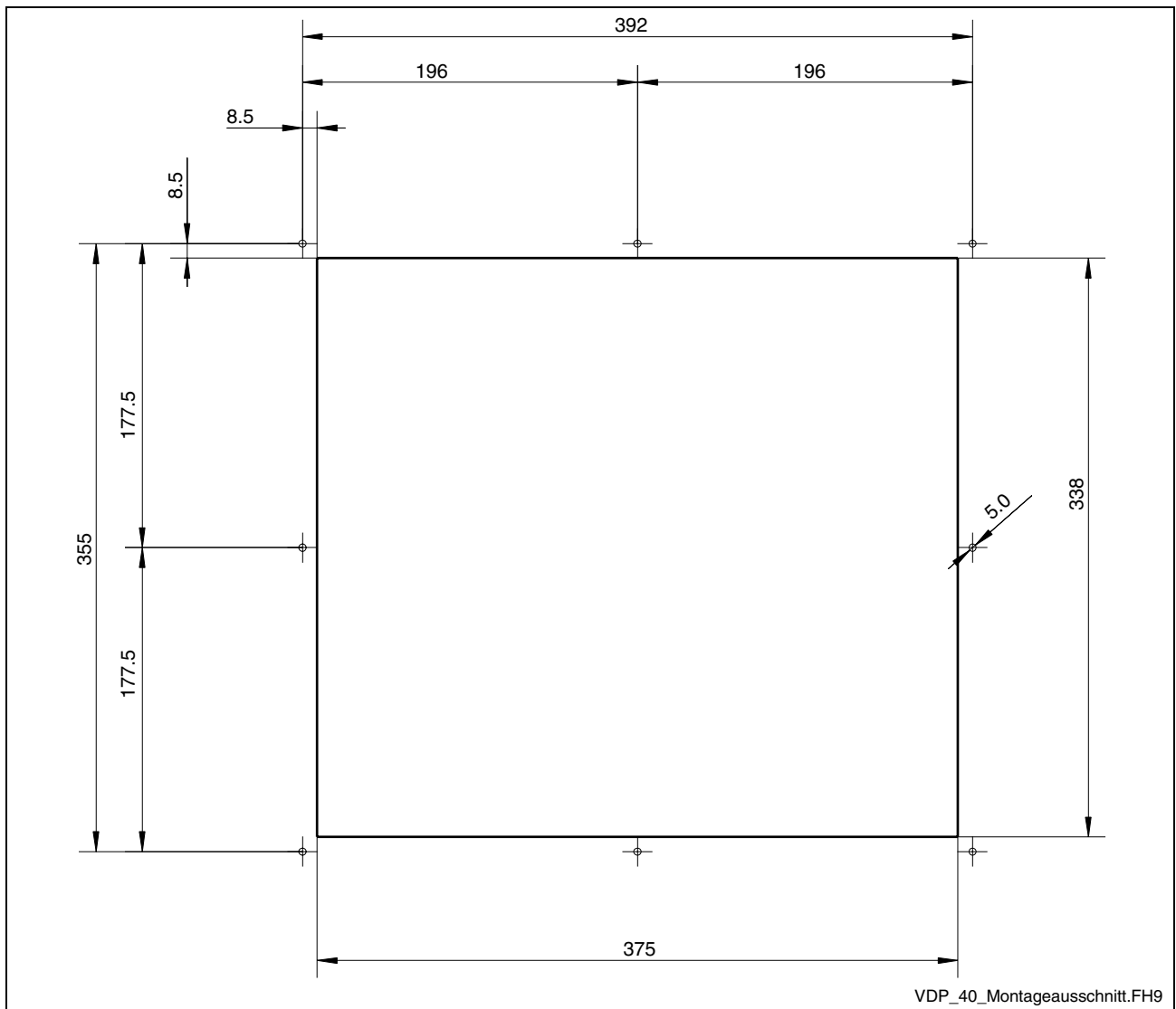


Fig. 5-17: Mounting dimensions VDP 40.1

Mounting Dimensions VDP 60.1

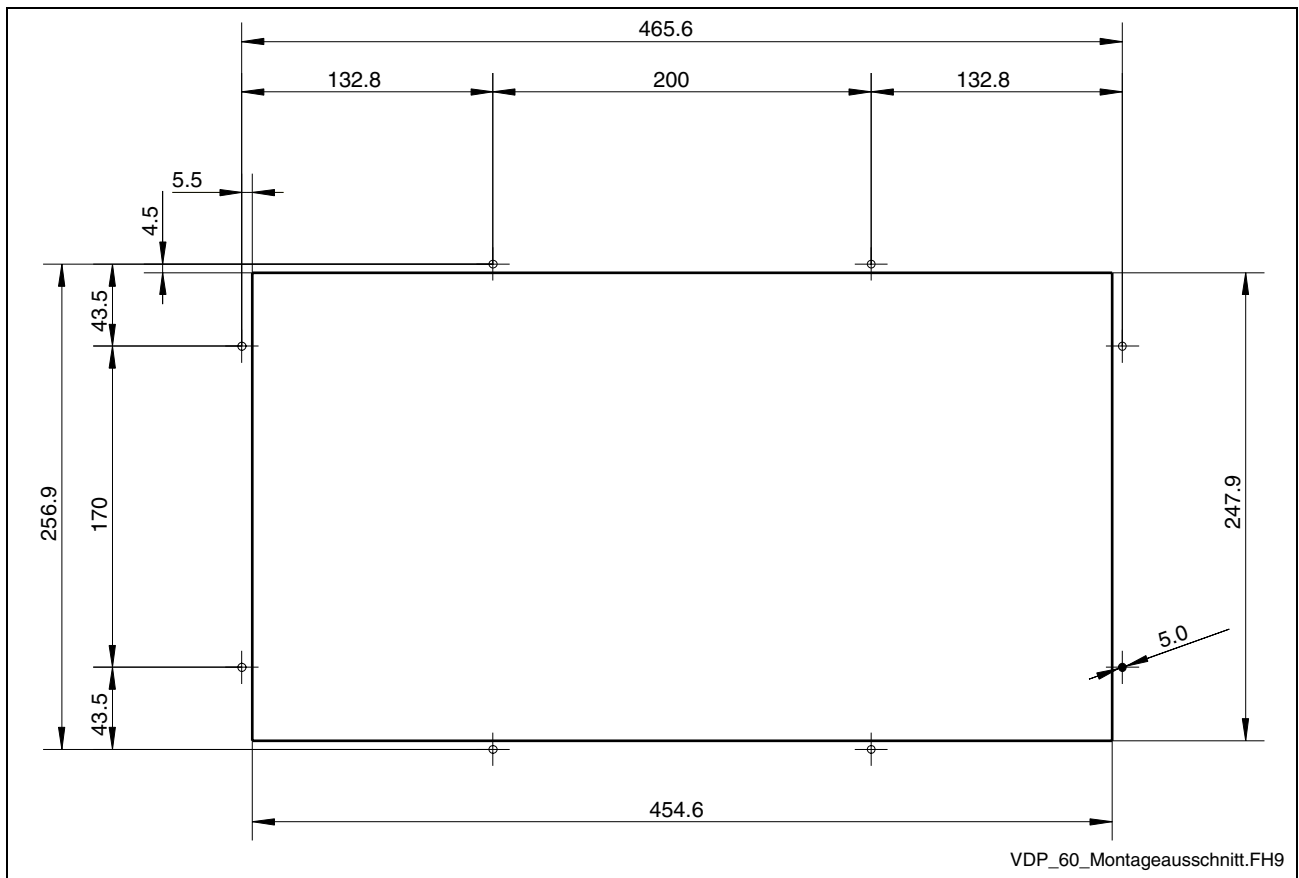


Fig. 5-18: Mounting dimensions VDP 60.1

6 Display and Operating Components

6.1 Backlight Switch-Off

The backlight as background lighting of the display has a limited lifetime (see section "Wear Parts" on page 4-5).

To extend the service life of the LCD backlight, the flat screen display features a backlight switch-off. This function "darkens" the display, if no operation of the operator terminal has occurred for a certain period of time. The length of the time interval can be specified in the Windows Control Panel.

If you use Windows XP, proceed as follows:

1. Select Icon "Display" in the Control Panel.

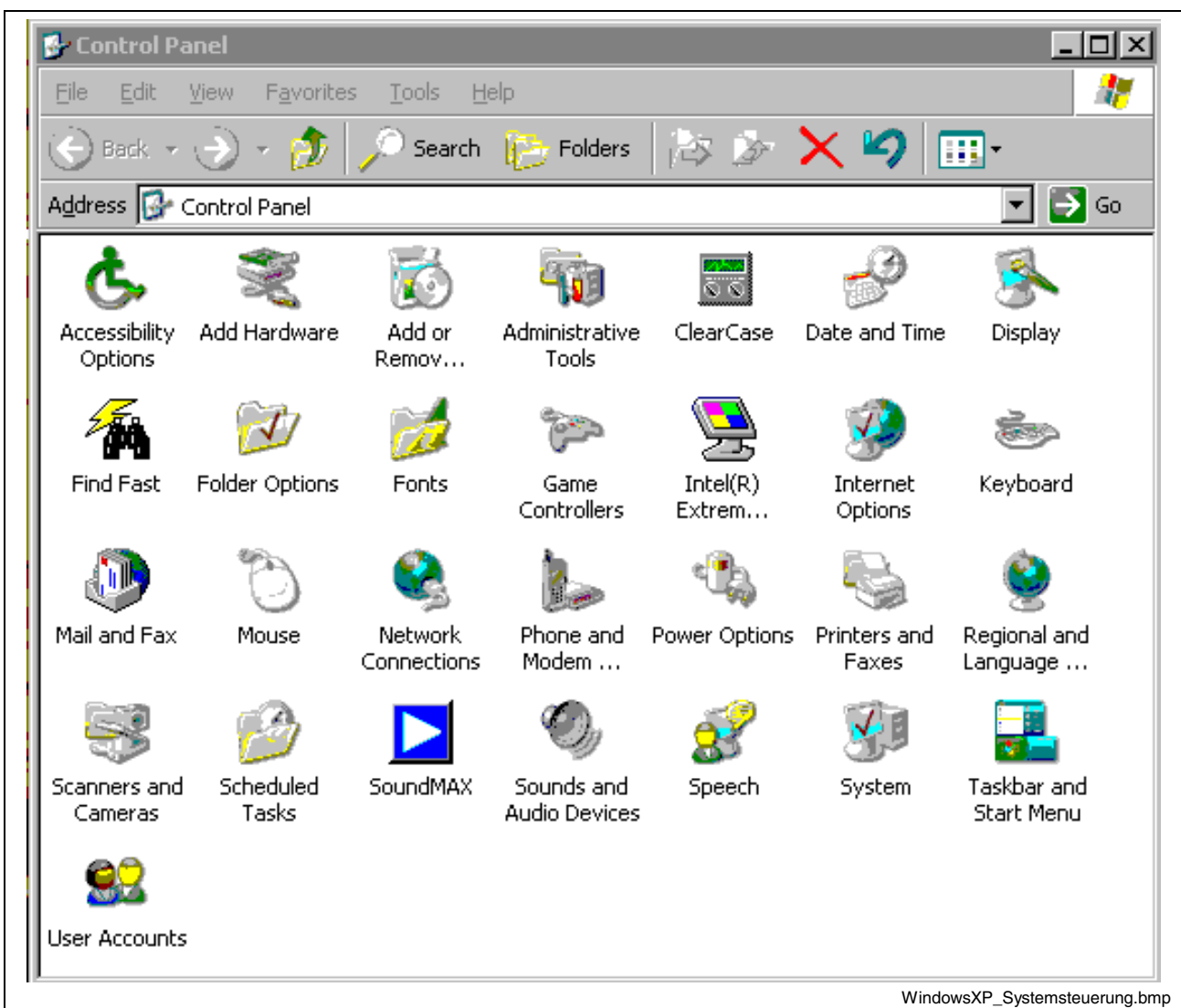


Fig. 6-1: Windows XP – Control Panel

2. Now, click on the "Screen Saver" tab.

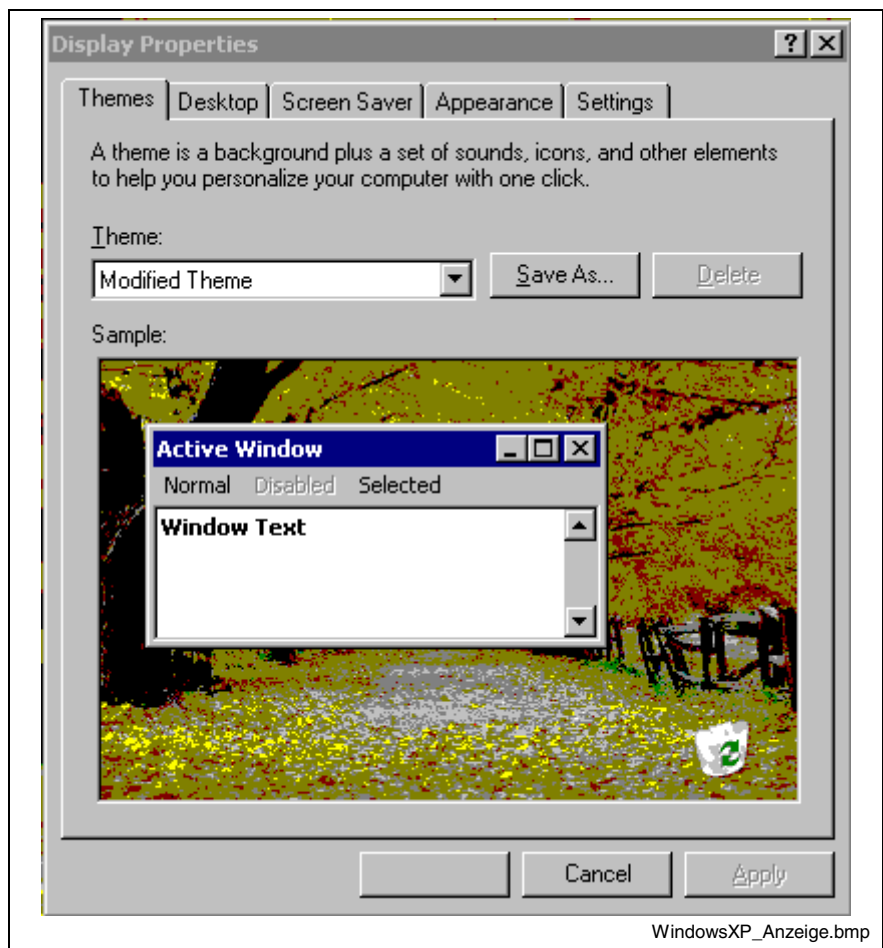


Fig. 6-2: Windows XP – Icon "Display"

3. Now, select the "Power" button.

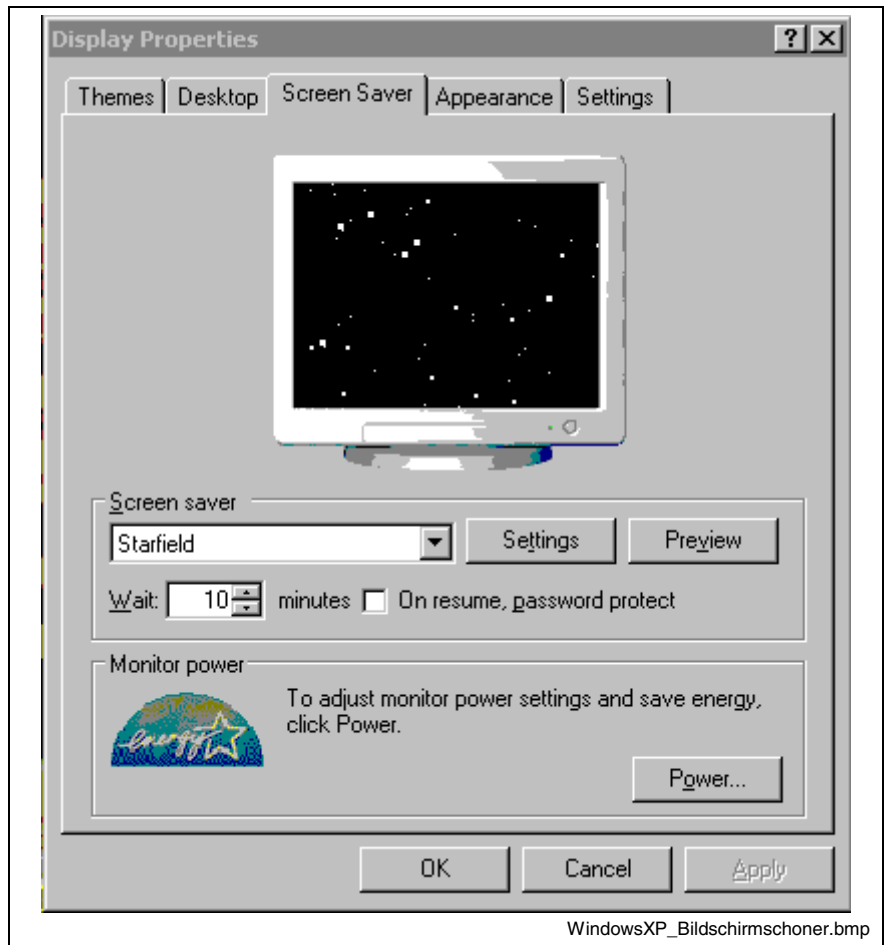


Fig. 6-3: Windows XP – "Screen Saver" tab

4. In the drop-down list under "Settings for Home/Office Desk power scheme" you can specify, in which period of time the backlight switch-off is to be activated.

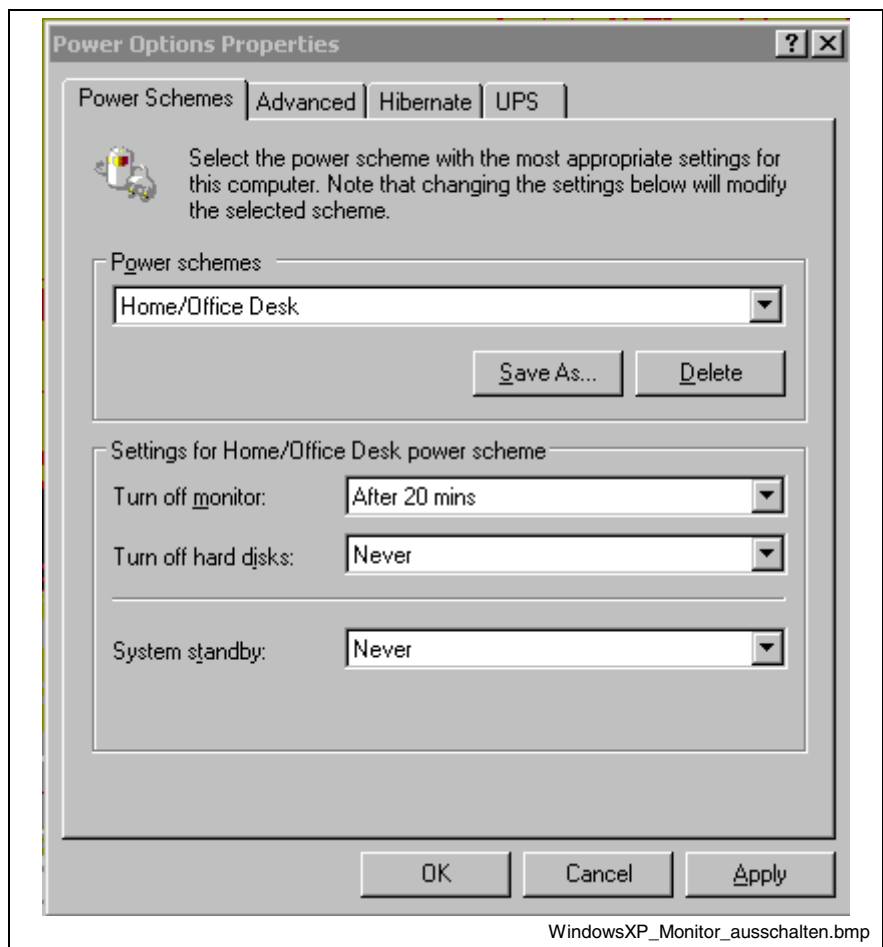


Fig. 6-4: Windows XP – "Power" button, drop-down list "Turn off monitor"

6.2 Operating and Error Indication

In the upper part of the front panel there are 4 LEDs to indicate the device states and errors. Depending on the variant the front panel provides labeled LEDs or illuminated symbols. Start the measures specified in the following table, if one of the succeeding LEDs indicates an error or a note.





Symbol / LED	Indicator	Meaning	Measure
 Power	LED green	Normal mode	-
	LED OFF	No supply voltage 230/115 VAC or 24 VDC	Check supply voltage at the power supply unit!
 HDD	LED yellow	Hard disk access	-
 Temp	LED green	Temperature in the safe range	
	LED red flashing	Temperature > 50 °C	Reduce ambient temperature (surrounding air temperature)! Check fan at the PC!
 UPS	LED OFF	Normal mode	-
	LED red	IPC is currently operating in battery mode, i. e. no power supply available!	Restore power supply and initiate controlled IPC restart!
	LED red flashing	Battery pack discharged, defective or not connected	Check battery pack! Maintain the charging time of 5 hours!

Fig. 6-5: LEDs to indicate operations and errors on the front panel

Note: Depending on the used industrial PC not all LEDs are activated. Further information you will find in the respective documentation of the IPC.

6.3 Keypad

System Requirements

To operate the keypad, an English or US keyboard driver is required. Therefore, don't change the corresponding manufacturer's settings.

Position of the Keys

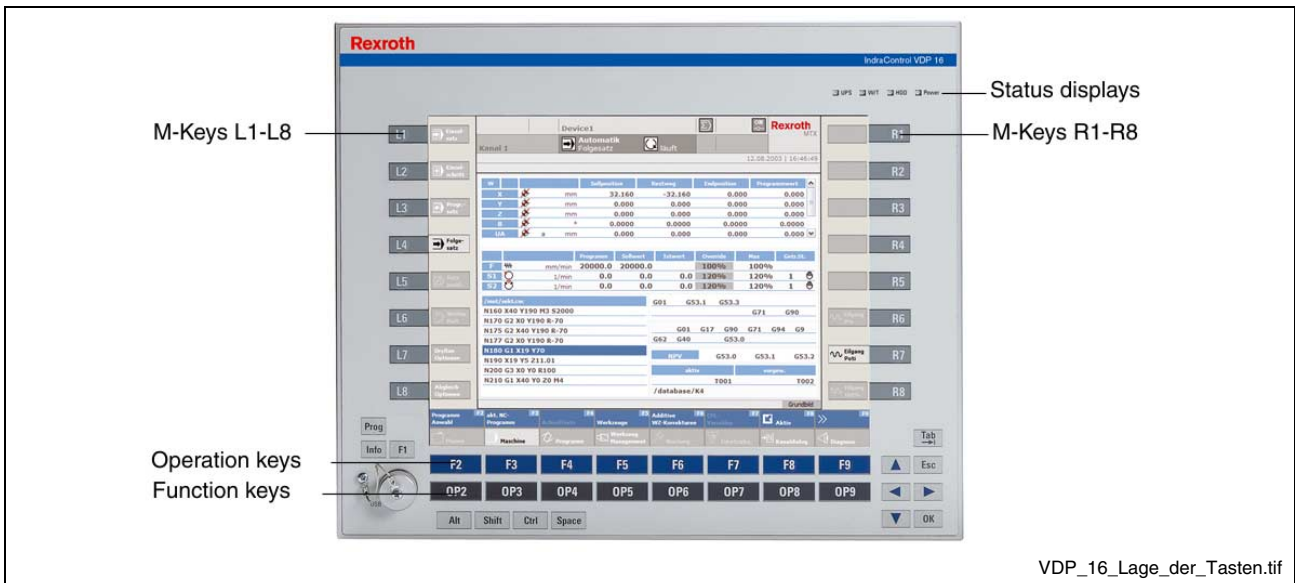


Fig. 6-6: Position of the keys VDP 16.1BK and VDP 40.1BI



Fig. 6-7: Position of the keys VDP 60.1BL

VDP 16.1 and VDP 40.1

Function and Operation Keys (F... + OP...)

The assignment of the function and operation keys is determined by the respective application software / the used operating system.

Use of an External Keyboard

Concerning the VDP 16.2BK and VDP 40.2BI keypad the key functions can also be activated with an external PC keyboard by pressing the following key combinations:

Keys of the VDP 16.1BK and VDP 40.1BI	Corresponding key of a standard keyboard
OP2	CTRL + SHIFT + ALT + F2
to	
OP9	CTRL + SHIFT + ALT + F9
PROG	CTRL + SHIFT + ALT + Q
INFO	CTRL + SHIFT + ALT + I

Fig. 6-8: Key combinations of the keys VDP 16.1BK and VDP 40.1BI

M-Keys

Eight M-Keys (machine function keys) are allocated at the right and the left side of the display (see Fig. 6-6). The keys on the right side of the display are labeled with R1 to R8, the keys on the left side of the display with L1 to L8.

Addressing of the M-Keys

The status of the M-Keys can be retrieved by several ways:

- Pressed M-Keys are transmitted as PS/2 signals to the PC.
- They can be transferred to a soft control installed on the PC via the serial interface COM3.
- At last, the signals are output at the optional plug XDP as outputs of a PROFIBUS DP slave.

Requesting M-Keys via PS/2 The following key codes are output:





Key combinations of the keys VDP 16.1BK and VDP 40.1BI	Corresponding key of a standard keyboard
M-Keys, left  to 	CTRL + ALT + SHIFT LINKS + X ASCII-Block X: 1 ... 8 (nicht NUM-Block)
M-Keys, right  to 	CTRL + ALT + SHIFT RECHTS + X ASCII-Block X: 1 ... 8 (nicht NUM-Block)

Fig. 6-9: Key combinations of the keys VDP 16.1BK and VDP 40.1BI

M-Keys may not be subject to a repeating operation (Key Controller -> Conti. Jogging of axes].

Request M-Keys via COM3

The states of the M-Keys can be transferred to a soft control via the serial interface COM3. The soft control has to send a request telegram and receives as response a keyboard telegram containing all key states.

The request telegram has to consist of one byte with value 0xB2.

The keyboard telegram is send not later than 10 ms after the reception of the request telegram. **Pressed M-Keys have the value "0"**; if the keys are not pressed, they have the value "1". The keyboard telegram has the following structure:

Byte 3	Byte 2	Byte 1	Byte 0
CRC	Status	M-Keys right (Bit 0 = R1 to Bit 7 = R8)	M-Keys left (Bit 0 = L1 to Bit 7 = L8)

Fig. 6-10: Keyboard telegram

In byte 2 a status is transmitted with the following meaning:

Value	Meaning
0x00	No error
0x01	Directly after Reset, during the self test a M-Key is pressed
0x02	Incoming request telegram before the current keypad telegram is finished

Fig. 6-11: Status byte

Value 0x01 means that during the self test executed directly after the reset, a M-Key was recognized as pressed. As, however, after a reset no key is activated, thus, a defective key can be recognized.

In byte 3 a CRC is transmitted. To calculate byte 3, byte 0 is bitwise linked with byte 1 by XOR. Then, the result is bitwise linked with byte 2 by XOR. After that, this result is transferred as CRC in byte 3.

- 7-6 The M-Keys are output at the optionally provided connection XDP (see page 7-6) as output bits of a PROFIBUS DP slave, so that they can be read by a connected PROFIBUS DP master as inputs. (The corresponding GSD file is archived in folder C:\SUPPORT\PROFIBUS.) **Pressed M-Keys have the value "0"**; if the keys are not pressed, they have the value "1".

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

Fig. 6-12: Assignment of the M-Keys at the PROFIBUS DP

VDP 60.1

Function and Special Keys (F... + S...)








Key combinations for the keys of the VDP 60.1BL	Corresponding key of a standard keyboard
Overview (binoculars) 	SHIFT + SPACE
Calling-up the basic screen (stairs) 	CTRL + HOME
Info 	SHIFT + RETURN
Function keys  to 	F1 - F8
Special keys  to 	SHIFT + F1 - SHIFT + F8

Fig. 6-13: Key combinations for the keys of the VDP 60.1BL

M-Keys









Key combinations for the keys of the VDP 60.1BL	Corresponding key of a standard keyboard
M-Keys, left 1 - 4  to 	F9 - F12
M-Keys, left 5 - 8  to 	SHIFT + F9 - SHIFT + F12
M-Keys, right 1 - 4  to 	CTRL + F9 - CTRL + F12
M-Keys, right 5 - 8  to 	CTRL + SHIFT + F9 - CTRL + SHIFT + F12

Fig. 6-14: Key combinations for the keys of the VDP 60.1BL

Output of the M-Keys and Function Keys via the PROFIBUS DP

Assignment and coding:

The keys are located in the first input byte. If no key is pressed, 0x00 is output.

The output of the M-Keys is code 0x10 to 0x1F.

M-Keys, left 1 - 8	0x10 - 0x17
M-Keys, right 1 - 8	0x18 - 0x1F

Fig. 6-15: Code 0x10 to 0x1F

The output of the function keys is code 0x20 to 0x2F.

Function keys F1 - F8	0x20 - 0x27
Function keys S1 - S8	0x28 - 0x2F

Fig. 6-16: Code 0x20 to 0x2F

Alphanumeric Block

The keys of the alphanumeric block send the default PS/2 codes to the PC.

The alpha key is locking "toggeling" and its output is no code, but only controls the keyboard controller. If the alpha key is active, the key LED flashes. Additional signs like @ and " are entered while pressing the alpha key.

The alphanumeric block works exactly like a standard PC keyboard as for the behavior of the "CTRL", "ALT" and "SHIFT" keys.

6.4 Touch Screen

In the variants VDP 16.1BB, VDP 16.1AC as well as VDP 40.1BE and VDP 40.1AG a touch screen is used, that allows the operation of the application software via the touch-sensitive surface of the displays.

You can change settings via setup programs of the IPC.

The icons available on the touch screen depend on the used application software.

6.5 Light-Emitting Diodes at the Y-Repeater

Three light-emitting diodes are located at the Y-Repeater:

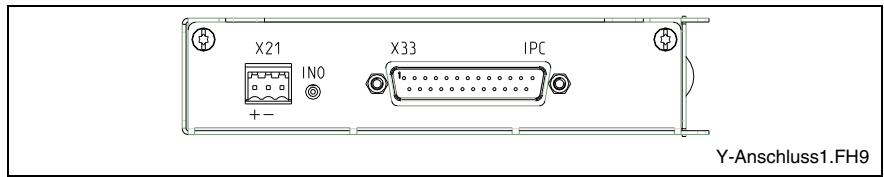


Fig. 6-17: LED IN0

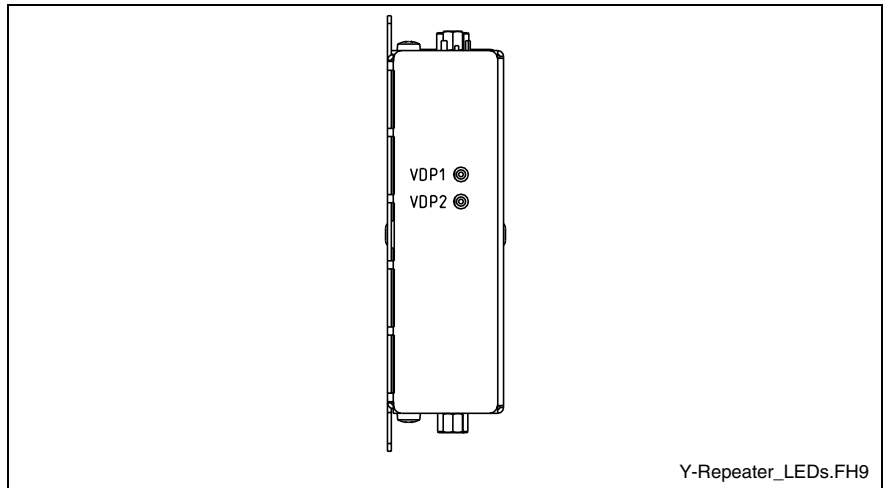


Fig. 6-18: LEDs for VDP1 and VDP2

IN0, VDP1 and VDP2 Light-Emitting Diodes

This three light-emitting diodes have the following meaning:

LED	Meaning
IN0	Y-Repeater is supplied by the IPC with power
VDP1	The IPC is connected to VDP1
VDP2	The IPC is connected to VDP2

Fig. 6-19: Meaning of the LEDs on the Y-Repeater

7 Interfaces

7.1 Interfaces at the VDP

View on the Connector Panel

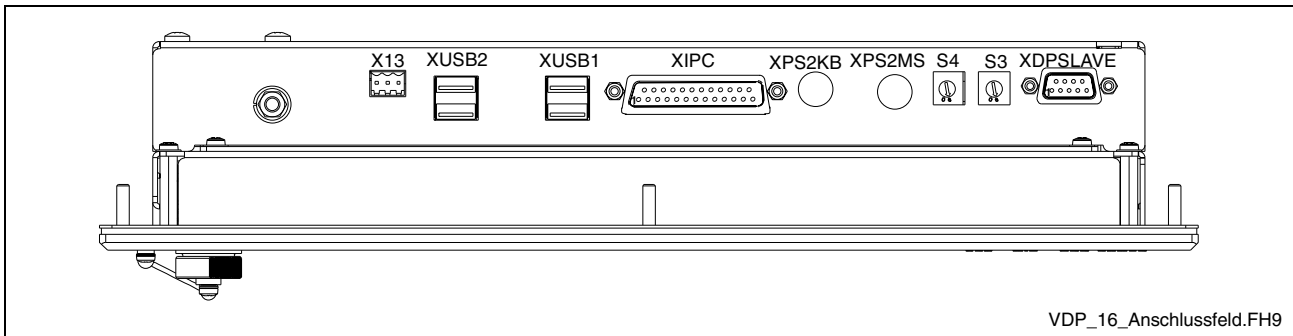


Fig. 7-1: Position of the interfaces

Description of the Interface

Interfaces

Des. on the housing	Type of connection	Type of connector (integrated)	Mating connector or cable (from outside)
X13	24 VDC – Power supply (required when using a Y-Repeater)	Weidmüller male connector terminal, MSTB 1.5, 3-pin	Weidmüller female connector terminal, MSTB 1.5, 3-pin
XUSB1	2 USB interfaces	USB female connector, 4-pin, type A	USB male connector, 4-pin
XUSB2	2 USB interfaces	USB female connector, 4-pin, type A	USB male connector, 4-pin
XIPC	GIGASTAR interface (connection to IPC)	D-Sub male connector, 25-pin	D-Sub female connector, 25-pin
XPS2KB	PS/2 keyboard connection	Mini-DIN PS/2 female connector, 6-pin	Mini-DIN PS/2 male connector, 6-pin
XPS2MS	PS/2 mouse connection	Mini-DIN PS/2 female connector, 6-pin	Mini-DIN PS/2 male connector, 6-pin
XDPSLAVE	PROFIBUS DP connection	D-Sub female connector, 9-pin	D-Sub male connector, 9-pin

Fig. 7-2: Interfaces at the VDP 16.1, VDP 40.1 and VDP 60.1

Rotary Switch

Des. on the housing	Switch type	Function
S3	BCD rotary switch for PROFIBUS DP slave station address (1-99)	To set the tens digit of the station address
S4	BCD rotary switch for PROFIBUS DP slave station address (1-99)	To set the ones digit of the station address

Fig. 7-3: Rotary switch

24 VDC Power Supply

X13 – 24 V Power Supply

The VDP is provided with the necessary power via the GIGASTAR interface of the IPC.

Note: If Y-Repeaters are used, the VDP must be separately provided with a voltage of 24 VDC via connection X13.

For this an isolated power supply unit is required.

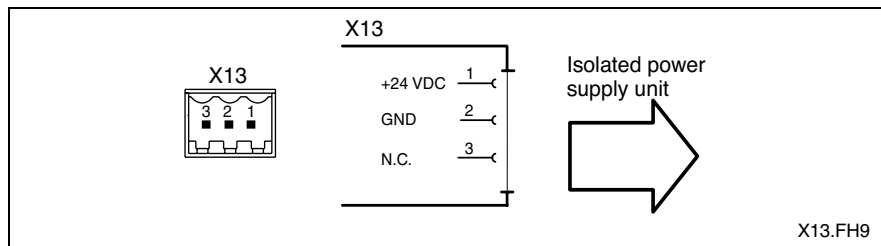


Fig. 7-4: 24 VDC power supply X13

Pin	Function
1	+24 V
2	GND
3	N.C.

To provide the device with power, you can use a commercially available 24 V industrial power supply unit.

Note: An isolated power supply unit has to be used, as pin 2 is internally connected with the housing.

USB Interfaces

XUSB – Serial Interfaces for Printer, Scanner, CD-ROM Drive

The devices feature two USB interfaces on the connector panel (XUSB1 and XUSB2) and one in the front panel (not for devices for the food industry).

Note: The maximum power consumption of the connected device must not exceed 500 mA. If the load exceeds 500 mA, the internal current monitoring is activated.

Note: The USB interfaces are not supported by the operating system Windows NT4.0.

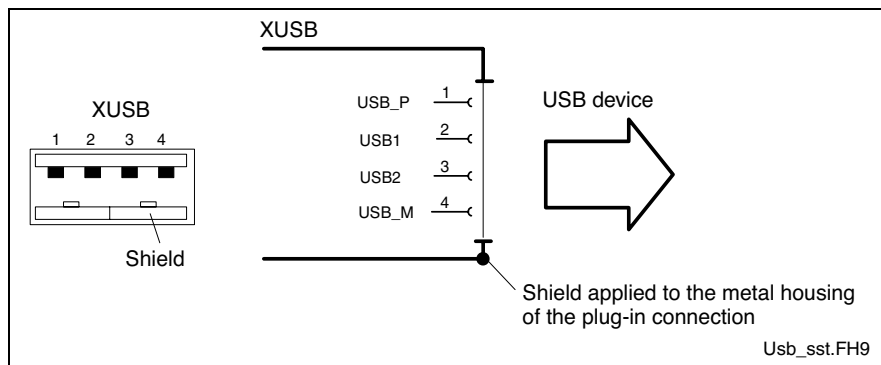


Fig. 7-5: USB interfaces XUSB1 and XUSB2

Pin	Function
1	USB power supply (max. 500 mA)
2	Data -
3	Data +
4	USB ground

Note: It is only possible to connect USB Devices fulfilling the USB specification. However, USB devices that e. g., don't maintain the reaction time, are also commercially available.

Thus, the general function of such non-specification-compliant USB devices can not be guaranteed, even if they are working e. g. at the USB interface directly at the IPC.

GIGASTAR Interface

XIPC – GIGASTAR Interface

The VDP is connected to the IPC via the 25-pin GIGASTAR interface (XIPC). You will find connecting cables with different length on page 10-4 in chapter "Ordering Information" under "Accessories".



CAUTION

Material damage by cable extension!

⇒ The cables must not be plugged together for extension purposes, as this might damage the VDP.

Combined Keyboard/Mouse Interface

The combined keyboard/mouse interface (XPS2KB) allows to connect an external keyboard/mouse. The data are transmitted via the GIGASTAR interface to the IPC.

XPS2KB – PS/2 Mini DIN Keyboard/Mouse Interface

PS/2 Mini-DIN female connector, 6-pin	
Cable length:	Max. 1.5 m
Cable type:	Shielded, cross section min. 0.14 mm ²

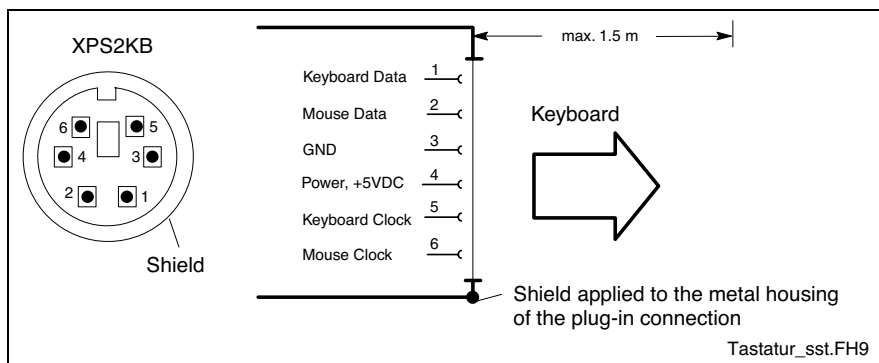


Fig. 7-6: Combined keyboard/mouse interface XPS2KB

Mouse Interface

The mouse interface (XPS2MS) can be connected to an external mouse. The data are transmitted via the GIGASTAR interface to the IPC.

XPS2MS – PS/2 Mouse Interface

PS/2 Mini-DIN female connector, 6-pin	
Cable length:	Max. 1.5 m
Cable type:	Shielded, cross section min. 0.14 mm ²
Interrupt (IRQ):	12
BIOS presettings:	PS/2 mouse support: Enabled PS/2 mouse: Auto detect

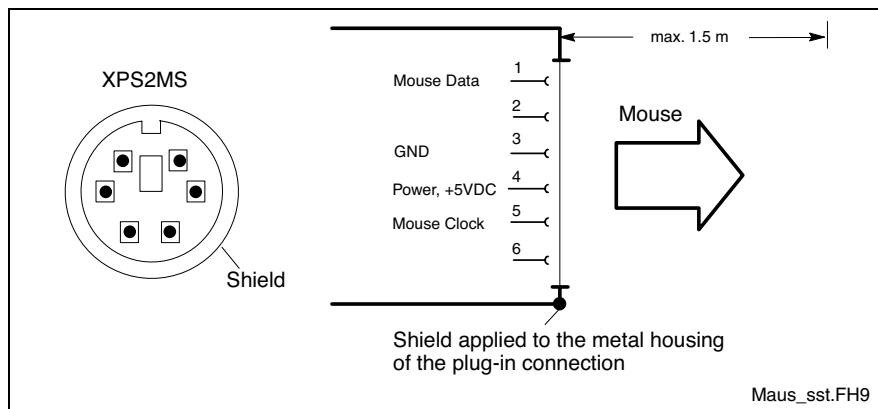


Fig. 7-7: Mouse interface XPS2MS

If a PS/2 mouse is not recognized by the system, the mouse has to be activated in the BIOS by switching from "Disabled" to "Autodetect". The operating system will not recognize the plugging-in of an external mouse after completed startup, because the mouse initialization occurs during the booting process.

Note: The connected mouse must be PS/2-compatible. Normally, the BIOS reserves IRQ 12 for the PS/2 mouse. If there are address conflicts, e. g., if IRQ 12 has already been occupied by another PC extension card, you should change the IRQ of this extension card to another IRQ, that is still free.

Note: If a keyboard with mouse is connected to the VDP, no further mouse may be connected to the mouse interface.

PROFIBUS DP Interface

XDPSLAVE – PROFIBUS DP Interface

Optionally, the connection XDPSLAVE provides a PROFIBUS DP SLAVE interface according to DIN EN 50170, Part 2. This interface allows to request the states of the M-Keys available for devices with keypad (see section M-Keys in chapter 6 on page 6-6 and 6-10).

D-Sub female connector, 9-pin	
Type:	RS485
Cable type:	Shielded, twisted pair
Transmission rate:	10 or 100 Mbits/s

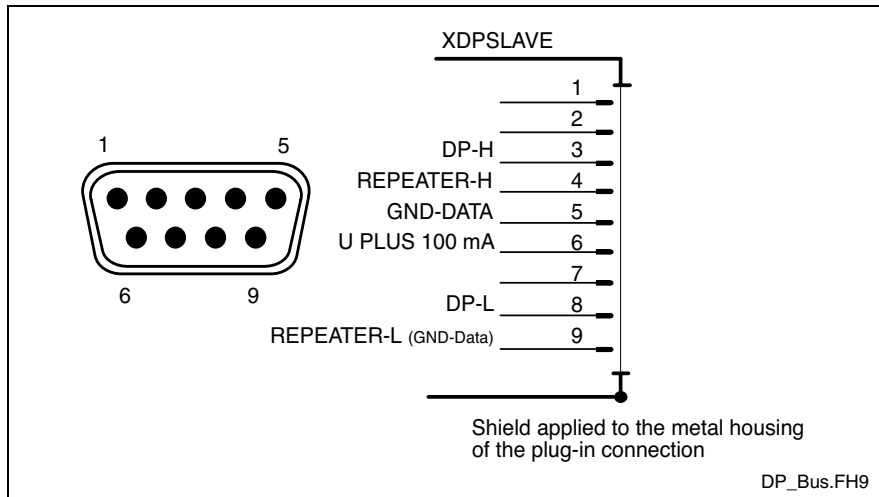


Fig. 7-8: PROFIBUS DP interface

The bus cable is specified as cable type A according to EN 50170, part 8-2. It must comply with the following cable parameters:

Surge impedance at a frequency within a range from 3 to 20 MHz	135 to 156 ohms
Operating capacity	≤ 30 pF/m
Loop resistance	≤ 110 ohms/km
Outside diameter	> 0.64 mm
Core cross-section	> 0.34 mm ²

Fig. 7-9: Parameters for PROFIBUS DP line

The above mentioned cable parameters of a standard cable of cable type A result in the following length extensions of a bus segment for the particular transmission rates:

Transmission rate in kbits/s	9,6	19,2	45,45	93,75	187,5	500	1500	3000	6000	12000
Max. segment length in m	1200	1200	1200	1200	1000	400	200	100	100	100

Fig. 7-10: Maximum segment length in relation to the transmission rate

Note: The respective PROFIBUS Slave address is set via the rotary switch (see page 7-1). The corresponding GSD file is Rx010135.gsd.

7.2 Interfaces at the Y-Repeater

View on the Connector Panels

The connections are located at the two shorter sides of the Y-Repeater:

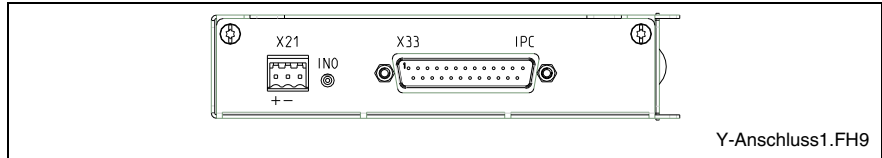


Fig. 7-11: Interface to the IPC

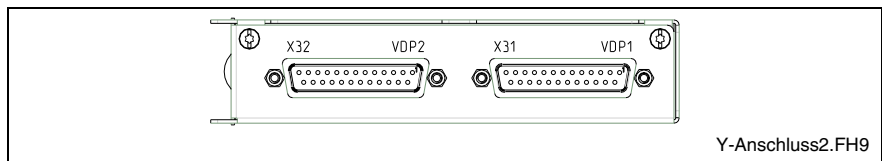


Fig. 7-12: Interface to the VDP displays

Description of the Interface

Overview

Des. on the housing	Type of connection	Type of connector (integrated)	Mating connector or cable (from outside)
X21	Digital 24 V input (input bit to select the active VDP)	Weidmüller male connector terminal, MSTB 1.5, 3-pin	Weidmüller female connector terminal, MSTB 1.5, 3-pin
X33	GIGASTAR interface (connection to IPC)	D-Sub male connector, 25-pin	D-Sub female connector, 25-pin
X31	GIGASTAR interface (connection to VDP1)	D-Sub female connector, 25-pin	D-Sub male connector, 25-pin
X32	GIGASTAR interface (connection to VDP2)	D-Sub female connector, 25-pin	D-Sub male connector, 25-pin

Fig. 7-13: Connection at the Y-Repeater

Connection of the Y-Repeater (Block Diagram)

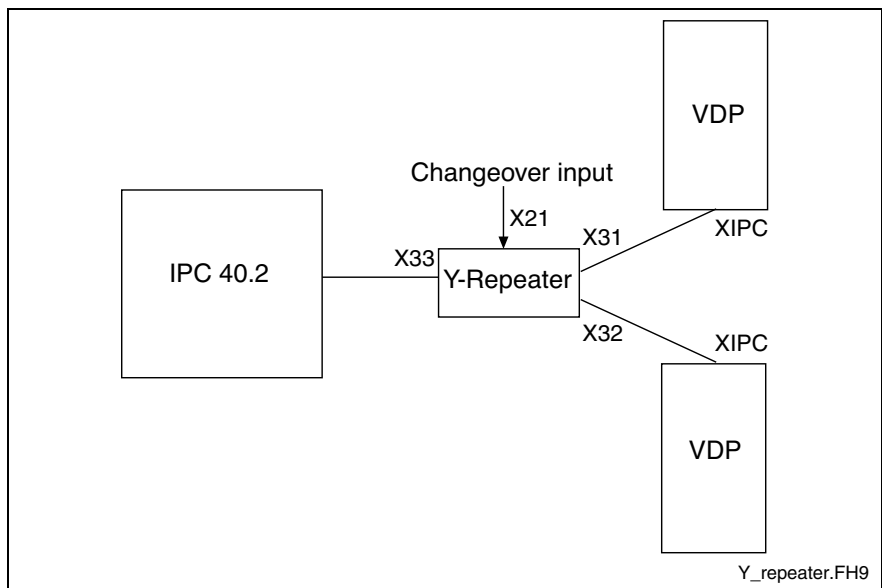


Fig. 7-14: Connection of the Y-Repeater

GIGASTAR Interface

X31, X32, X33 – GIGASTAR Interfaces

Via the 25-pin GIGASTAR interface (X31, X32, X33) the Y-Repeater is connected, on the one hand, to the IPC and, on the other hand, to the two VDP displays. You will find connecting cables with different length on page 10-4 in chapter "Ordering Information" under "Accessories".

Connection	Function
X31	GIGASTAR interface to IPC
X32	GIGASTAR interface to VDP1
X33	GIGASTAR interface to VDP2

Fig. 7-15: Assignment of the three GIGASTAR interfaces

Via the GIGASTAR interface the image data as well as the mouse signals are transmitted from the IPC to the VDP displays.



CAUTION

Material damage by cable extension!

⇒ The cables must not be plugged together for extension purposes, as this might damage the VDP.

The following cable length must not be exceeded:

Cable between IPC and Y-Repeater	< 15 meters
Cable between Y-Repeater and VDP	< 25 meters
Total length between IPC and VDP	< 30 meters

Fig. 7-16: Permissible cable length of the GIGASTAR interfaces

Consider that you have to maintain all three values!

Digital 24 V Input (Changeover Input)

X21 – Digital 24 V Input The selection, which of the VDP displays connected to the Y-Repeater is activated, occurs via a digital 24 V input.

As the image signals are transmitted to both VDP displays, data can only be entered with the active VDP.

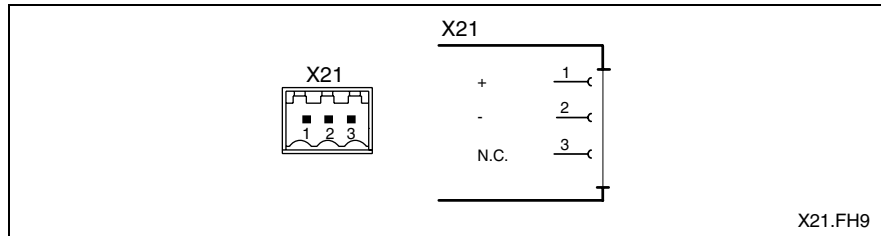


Fig. 7-17: Assignment of the digital 24 V input

Pin	Labeling	Function
1	+	Signal input
2	-	Signal ground
3	N.C.	not assigned

Fig. 7-18: Pin assignment X21

Input bit X21	Active VDP
0 (or open)	VDP1
1	VDP2

Fig. 7-19: Selection of the active VDP

Connection method	2-wire connection
Reverse voltage protection	Yes
Input voltage: Nominal value at "0" Nominal value at "1"	-3 V ... + 5 V 11 V ... 30 V
Input current: Nominal value at "0" Nominal value at "1"	< 2,5 mA 2,8 mA ... 6 mA
Cable length (unshielded)	< 100 m
Short-circuit protection, overcurrent protection	Typ. 0.6 A

Fig. 7-20: Characteristic value of the digital 24 V input

Note: During the booting process of the IPC you must not switch from VDP1 to VDP2.

8 Maintenance and Installation

8.1 General Information

The displays are maintenance-free. Some components are subject to wear and must be replaced.

Maintenance Include the following measures in your maintenance schedule:

- Clean the screen surface at least once a week with an anti-static cloth or window cleaning agent containing denatured alcohol.



CAUTION!

Dissolution of the keypad surface and the display seal through contact with solvents!

⇒ Do not use any solvents (e. g. paint thinner)!

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



DANGER

Risk of injury through rotating fan impeller!

⇒ Keep hands and fingers clear of the fan impeller, and do not insert any items.

8.2 LCD Display

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

8.3 Connection of Two VDP Displays via the Y-Repeater

To connect two VDP displays to one IPC, the Y-Repeater is available as accessories. The Y-Repeater is located between IPC and the two VDP displays. The image signals of the IPC are send simultaneously via the Y-Repeater to the two VDP displays. However, which of the two VDP displays can be used as active VDP to operate the IPC, must be selected with a 24 V signal. For safety reasons only one of the VDP displays can be active. At the Y-Repeater is indicated which VDP is active.

The connection of the Y-Repeater are specified in chapter 7.2.

Note: If you use a Y-Repeater, you may only operate with VDP displays of the same type.

Note: The end devices (mouse, keyboard) connected to the two VDP displays must be of the same type (e.g. a two-key mouse). Otherwise, it is not possible to switch between the two VDP displays.

Note: During the booting process of the IPC you must not switch from VDP1 to VDP2.

Note: The VDP displays must be provided with power before or simultaneously with the IPC.

9 Touch Screen Software

In the displays VDP 16.1BB, VDP 16.1AC as well as VDP 40.1BE and VDP 40.1AG a touch screen is used, that allows the operation via the touch-sensitive surface of the displays.

The touch screen controller communicates with the PC via the GIGASTAR interface using the serial interface COM2 of the IPC.

The driver software required for the touch screen is installed on the IPC ex works. For information how to change settings refer to the documentation about the IPC.

Note: For this, please consider the Project Planning Manual Rexroth IPC 40.2, DOK-SUPPL *-IPC*40.2***-PR..-EN-P.

10.2 Accessories

Y-Repeater

To connect two VDP displays to one IPC, the Y-Repeater is provided.

Ordering designation	Part number	Description
VAC01.1S-YG4-NNNN	R911307623	Y-Repeater for GIGASTAR

Fig. 10-4: Y-Repeater

Connecting Cable to the IPC 40.2 (GIGASTAR Interfaces)

Using a Y-Repeaters the following cables are utilized also to connect IPC and Y-Repeater as well as to connect Y-Repeater and VDP. Consider thereby absolutely the maximum lengths specified in Fig. 7-16 on page 7-8.

Ordering designation	Part number	Description
BKS-U-H-G4****-IPCVDP-001,0-P	R911307684	Connecting cable IPC – VDP, high-flexible, 1 m
BKS-U-H-G4****-IPCVDP-005,0-P	R911306043	Connecting cable IPC – VDP, high-flexible, 5 m
BKS-U-H-G4****-IPCVDP-010,0-P	R911306046	Connecting cable IPC – VDP, high-flexible, 10 m
BKS-U-H-G4****-IPCVDP-015,0-P	R911308482	Connecting cable IPC – VDP, high-flexible, 15 m
BKS-U-H-G4****-IPCVDP-020,0-P	R911306047	Connecting cable IPC – VDP, high-flexible, 20 m
BKS-U-H-G4****-IPCVDP-030,0-P	R911306048	Connecting cable IPC – VDP, high-flexible, 30 m

Fig. 10-5: Connecting cable to the IPC 40.2

Storage Media

Ordering designation	Part number	Description
MC OSFLASHUSB-064M	1070 170184	USB memory stick 64 Mbytes

Fig. 10-6: Storage media for the VDP 16.1, VDP 40.1 and VDP 60.1

11 List of Figures

- Fig. 1-1: Distinguishing features VDP 16.1 1-1
- Fig. 1-2: Distinguishing features VDP 40.1 1-1
- Fig. 1-3: Features VDP 60.1 1-2
- Fig. 1-4: VDP 16.1 with touch screen 1-3
- Fig. 1-5: VDP 16.1 with keypad 1-4
- Fig. 1-6: VDP 40.1 with touch screen 1-5
- Fig. 1-7: VDP 40.1 with keypad 1-6
- Fig. 1-8: VDP 60.1 with keypad 1-7
- Fig. 3-1: Hazard classification (according to ANSI Z535) 3-1
- Fig. 4-1: Technical data: front VDP 16.1 4-1
- Fig. 4-2: Technical data: front VDP 40.1 4-1
- Fig. 4-3: Technical data: front VDP 60.1 4-1
- Fig. 4-4: Ambient conditions 4-2
- Fig. 4-5: Used standards 4-2
- Fig. 4-6: Service life of the backlight 4-3
- Fig. 4-7: Service life of the fan 4-3
- Fig. 5-1: Dimensions – Front panel VDP 16.1BK 5-1
- Fig. 5-2: Dimensions – Front panel VDP 16.1AC 5-2
- Fig. 5-3: VDP 16.1BB and VDP 16.1BK – Bottom view 5-3
- Fig. 5-4: VDP 16.1BB and VDP 16.1BK – Bottom view 5-3
- Fig. 5-5: Dimensions VDP 16.1 5-3
- Fig. 5-6: Dimensions – Front panel VDP 40.1BE and VDP 40.1BI 5-4
- Fig. 5-7: Dimensions – Front panel VDP 40.1AG 5-5
- Fig. 5-8: VDP 40.1BE and VDP 40.1BI – Bottom view 5-6
- Fig. 5-9: VDP 40.1BE and VDP 40.1BI – Bottom view 5-6
- Fig. 5-10: Dimensions VDP 40.1 5-6
- Fig. 5-11: Dimensions – Front panel VDP 60.1BL 5-7
- Fig. 5-12: VDP 60.1BL – Bottom view 5-8
- Fig. 5-13: VDP 60.1BL – Bottom view 5-8
- Fig. 5-14: Dimensions VDP 60.1 5-8
- Fig. 5-15: Dimensions of the Y-Repeater 5-9
- Fig. 5-16: Mounting dimensions VDP 16.1 5-11
- Fig. 5-17: Mounting dimensions VDP 40.1 5-12
- Fig. 5-18: Mounting dimensions VDP 60.1 5-13
- Fig. 6-1: Windows XP – Control Panel 6-1
- Fig. 6-2: Windows XP – Icon "Display" 6-2
- Fig. 6-3: Windows XP – "Screen Saver" tab 6-3
- Fig. 6-4: Windows XP – "Power" button, drop-down list "Turn off monitor" 6-4
- Fig. 6-5: LEDs to indicate operations and errors on the front panel 6-5
- Fig. 6-6: Position of the keys VDP 16.1BK and VDP 40.1BI 6-6
- Fig. 6-7: Position of the keys VDP 60.1BL 6-6

- Fig. 6-8: Key combinations of the keys VDP 16.1BK and VDP 40.1BI 6-7
- Fig. 6-9: Key combinations of the keys VDP 16.1BK and VDP 40.1BI 6-8
- Fig. 6-10: Keyboard telegram 6-8
- Fig. 6-11: Status byte 6-9
- Fig. 6-12: Assignment of the M-Keys at the PROFIBUS DP 6-9
- Fig. 6-13: Key combinations for the keys of the VDP 60.1BL 6-10
- Fig. 6-14: Key combinations for the keys of the VDP 60.1BL 6-11
- Fig. 6-15: Code 0x10 to 0x1F 6-11
- Fig. 6-16: Code 0x20 to 0x2F 6-11
- Fig. 6-17: LED IN0 6-13
- Fig. 6-18: LEDs for VDP1 and VDP2 6-13
- Fig. 6-19: Meaning of the LEDs on the Y-Repeater 6-13
- Fig. 7-1: Position of the interfaces 7-1
- Fig. 7-2: Interfaces at the VDP 16.1, VDP 40.1 and VDP 60.1 7-1
- Fig. 7-3: Rotary switch 7-1
- Fig. 7-4: 24 VDC power supply X13 7-2
- Fig. 7-5: USB interfaces XUSB1 and XUSB2 7-3
- Fig. 7-6: Combined keyboard/mouse interface XPS2KB 7-4
- Fig. 7-7: Mouse interface XPS2MS 7-5
- Fig. 7-8: PROFIBUS DP interface 7-6
- Fig. 7-9: Parameters for PROFIBUS DP line 7-6
- Fig. 7-10: Maximum segment length in relation to the transmission rate 7-6
- Fig. 7-11: Interface to the IPC 7-7
- Fig. 7-12: Interface to the VDP displays 7-7
- Fig. 7-13: Connection at the Y-Repeater 7-7
- Fig. 7-14: Connection of the Y-Repeater 7-7
- Fig. 7-15: Assignment of the three GIGASTAR interfaces 7-8
- Fig. 7-16: Permissible cable length of the GIGASTAR interfaces 7-8
- Fig. 7-17: Assignment of the digital 24 V input 7-9
- Fig. 7-18: Pin assignment X21 7-9
- Fig. 7-19: Selection of the active VDP 7-9
- Fig. 7-20: Characteristic value of the digital 24 V input 7-9
- Fig. 10-1: Type code VDP 16.1 10-1
- Fig. 10-2: Type code VDP 40.1 10-2
- Fig. 10-3: Type code VDP 60.1 10-3
- Fig. 10-4: Y-Repeater 10-4
- Fig. 10-5: Connecting cable to the IPC 40.2 10-4
- Fig. 10-6: Storage media for the VDP 16.1, VDP 40.1 and VDP 60.1 10-4

12 Index

A

Accessories 10-4
Addressing of the M-Keys 6-7
Air pressure 4-2
Ambient Conditions 4-2
Appropriate use
 Introduction 2-1
 Uses 2-2

B

Backlight switch-off 6-1

C

CE marking 4-2
Changeover input 7-9
Combined keyboard/mouse interface 7-4
Compatibility test 4-3
Connecting cable to the Y-Repeater 10-4

D

Digital 24 V input 7-9
Dimensions 5-1
 Housing dimensions VDP 16.1 5-1
 Housing dimensions VDP 40.1 5-4
 Housing dimensions VDP 60.1 5-7
 Installation notes 5-10
 Mounting cut-out 5-10
 Mounting dimensions VDP 16.1 5-11
 Mounting dimensions VDP 40.1 5-12
 Mounting dimensions VDP 60.1 5-13
 VDP 16.1AC 5-2
 VDP 16.1BB 5-1
 VDP 40.1BE 5-4
 VDP 40.1BI 5-4
Display and operating components 6-1

E

External keyboard
 VDP 16.1 and VDP 40.1 6-7
 VDP 60.1 6-10

F

Function and operation keys
 Function and operation keys at the VDP 60.1 6-10
 Function and operation keys of the VDP 16.1 and the VDP 40.1 6-7

G

GIGASTAR interface at the VDP 7-4
GIGASTAR interface at the Y-Repeater 7-8

H

Housing dimensions
 VDP 16.1BK 5-1
 VDP 40.1AG 5-5
 VDP 60.1BL 5-7

I

- Inappropriate use 2-2
 - Consequences, Discharge of liability 2-1
- Interface at the VDP
 - GIGASTAR 7-4
- Interfaces 7-1
- Interfaces at the VDP 7-1
 - PROFIBUS DP 7-6
 - PS/2 7-4
 - USB 7-3
- Interfaces at the Y-Repeater 7-7
 - Changeover input 7-9
 - Digital input 7-9
 - GIGASTAR 7-8

K

- Key combinations
 - VDP60.1 6-10
- Keyboard
 - External keyboard for VDP 16.1 and VDP 40.1 6-7
 - External keyboard for VDP 60.1 6-10
 - Keyboard/mouse interface 7-4
- Keypad 6-6
- Keys
 - Keys at the VDP 60.1 6-10
 - Keys of the VDP 16.1 and the VDP 40.1 6-7
 - Position of the keys 6-6

L

- LEDs
 - Displays at the Y-Repeater 6-13
- Light-emitting diodes at the Y-Repeater 6-13

M

- Machine function keys 6-7
- Maintenance 8-1
 - General information 8-1
 - LCD display 8-1
 - Y-Repeater 8-1
- Maximum ambient temperature (surrounding air temperature) 4-2
- Mechanical strength 4-2
- M-Keys
 - M-Keys at the VDP 16.1 and the VDP 40.1 6-7
 - M-Keys at the VDP 60.1 6-11
- Mounting cut-out 5-10
 - VDP 16.1 5-11
 - VDP 40.1 5-12
 - VDP 60.1 5-13
- Mouse interface 7-5

O

- Ordering information 10-1

P

- Positions of the keys 6-6
- Power Supply – 24V 7-2
- PROFIBUS DP interface 7-6
- PS/2 interface 7-4
- PS/2 keyboard connection 7-4
- PS/2 mouse connection 7-5

R

Relative humidity 4-2
Rotary switch 7-1

S

Safety Instructions for Electric Drives and Controls 3-1
Software
 Touch Screen 9-1
Standards 4-2
Storage media 10-4
System presentation 1-1
 Brief description 1-1
 Commissioning 1-7
 Variants 1-1

T

Technical data
 Wear parts 4-3
Technical data
 Ambient conditions 4-2
 Front panel 4-1
 Power supply 4-1
 Used standards 4-2
Technical Data 4-1
Temperature gradient 4-2
Touch screen 6-12
Touch Screen Software 9-1
Type code 10-1

U

UL/CSA Certification 4-3
USB interfaces 7-3
USB Interfaces 7-3
Use *See appropriate use and inappropriate use*

V

VDP 16.1 - Variants 1-3
VDP 16.1AC with Touch Screen, Suitable for the Food Industry 1-3
VDP 16.1BB – Bottom view 5-3
VDP 16.1BB Touch Screen 1-3
VDP 16.1BK – Bottom view 5-3
VDP 16.1BK with keypad, Standard variant 1-4
VDP 40.1 - Variants 1-5
VDP 40.1AG with touch screen, suitable for the food industry 1-5
VDP 40.1BE – Bottom view 5-6
VDP 40.1BE with touch screen 1-5
VDP 40.1BI – Bottom view 5-6
VDP 40.1BI – Bottom view 5-6
VDP 40.1BI with keypad, Standard variant 1-6
VDP 60.1 1-7
VDP 60.1BL – Bottom view 5-8

Y

Y-Repeater 10-4
 Housing dimensions 5-9
 Interfaces 7-7

13 Service & Support

13.1 Helpdesk

Unser Kundendienst-Helpdesk im Hauptwerk Lohr am Main steht Ihnen mit Rat und Tat zur Seite. Sie erreichen uns

Our service helpdesk at our headquarters in Lohr am Main, Germany can assist you in all kinds of inquiries. Contact us

- telefonisch - by phone:
über Service Call Entry Center
- via Service Call Entry Center
- per Fax - by fax:
- per e-Mail - by e-mail: service.svc@boschrexroth.de

+49 (0) 9352 40 50 60

Mo-Fr 07:00-18:00
Mo-Fr 7:00 am - 6:00 pm

+49 (0) 9352 40 49 41

13.2 Service-Hotline

Außerhalb der Helpdesk-Zeiten ist der Service direkt ansprechbar unter

After helpdesk hours, contact our service department directly at

+49 (0) 171 333 88 26

oder - or

+49 (0) 172 660 04 06

13.3 Internet

Unter www.boschrexroth.com finden Sie ergänzende Hinweise zu Service, Reparatur und Training sowie die **aktuellen** Adressen *) unserer auf den folgenden Seiten aufgeführten Vertriebs- und Servicebüros.

At www.boschrexroth.com you may find additional notes about service, repairs and training in the Internet, as well as the **actual** addresses *) of our sales- and service facilities figuring on the following pages.



Verkaufsniederlassungen



Niederlassungen mit Kundendienst

Außerhalb Deutschlands nehmen Sie bitte zuerst Kontakt mit unserem für Sie nächstgelegenen Ansprechpartner auf.



sales agencies



offices providing service

Please contact our sales / service office in your area first.

*) Die Angaben in der vorliegenden Dokumentation können seit Drucklegung überholt sein.

*) Data in the present documentation may have become obsolete since printing.

13.4 Vor der Kontaktaufnahme... - Before contacting us...

Wir können Ihnen schnell und effizient helfen wenn Sie folgende Informationen bereithalten:

For quick and efficient help, please have the following information ready:

1. detaillierte Beschreibung der Störung und der Umstände.
2. Angaben auf dem Typenschild der betreffenden Produkte, insbesondere Typenschlüssel und Seriennummern.
3. Tel./Faxnummern und e-Mail-Adresse, unter denen Sie für Rückfragen zu erreichen sind.

1. Detailed description of the failure and circumstances.
2. Information on the type plate of the affected products, especially type codes and serial numbers.
3. Your phone/fax numbers and e-mail address, so we can contact you in case of questions.

13.5 Kundenbetreuungsstellen - Sales & Service Facilities

Deutschland – Germany

vom Ausland:

(0) nach Landeskennziffer weglassen!

from abroad:

don't dial (0) after country code!

Vertriebsgebiet Mitte Germany Centre	SERVICE AUTOMATION	SERVICE AUTOMATION	SERVICE AUTOMATION
<p>Rexroth Indramat GmbH Bgm.-Dr.-Nebel-Str. 2 / Postf. 1357 97816 Lohr am Main / 97803 Lohr</p> <p>Kompetenz-Zentrum Europa</p> <p>Tel.: +49 (0)9352 40-0 Fax: +49 (0)9352 40-4885</p>	<p>CALL ENTRY CENTER Helpdesk MO – FR</p> <p>von 07:00 - 18:00 Uhr from 7 am – 6 pm</p> <p>Tel. +49 (0) 9352 40 50 60 Fax +49 (0) 9352 40 49 41 service.svc@boschrexroth.de</p>	<p>HOTLINE 24 / 7 / 365</p> <p>außerhalb der Helpdesk-Zeit out of helpdesk hours</p> <p>Tel.: +49 (0)172 660 04 06 oder / or Tel.: +49 (0)171 333 88 26</p>	<p>ERSATZTEILE / SPARES verlängerte Ansprechzeit - extended office time -</p> <ul style="list-style-type: none"> ◆ nur an Werktagen - only on working days - ◆ von 07:00 - 18:00 Uhr - from 7 am - 6 pm - <p>Tel. +49 (0) 9352 40 42 22</p>
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