Electric Drives and Controls | Hydraulics | Linear Motion and Assembly Technologies | Pneumatics | Service

Rexroth
Bosch Group

Rexroth VSB 40.1

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Project Planning Manual

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Contents

1 System Representation

1.1 Brief Description VSB 40.1

The VSB 40.1 is an industrial PC, that represents in combination with a display VDP 16 or VDP 40 a PC-based operator terminal, and that can – depending on the application and configuration – also perform control functions.

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Fig. 1-1: VSB 40.1

The VSB 40.1 is connected with the operator panel interface G4 display interface of the display VDP 16 or VDP 40 via a cable with a length of up to 30 m. Thus, the VSB 40.1 can be installed in the control cabinet and the display in its door or at the machine. Longer connections are also possible. These are described in the project planning manual for the VDP 16 display and the VDP 40 display.

All components of the VSB including the hard disk and the power supply unit are accommodated in the so-called PC box. The PC box provides six PCI slots at the slots A1 to A6.

The plug board is equipped with the PC standard interfaces. A plug-in card providing the G4 display interface is inserted at slot A0.

Optionally, the VSB 40.1 can be equipped with a DVD-ROM drive or a DVD/CD-RW drive.

1.2 Operating System

For license reasons the VSB 40.1 devices are only delivered with already installed operating system.

1.3 Commissioning

Mount the device properly (for this, see chapter "Dimensions and Installation Notes as of page 5-1). Then, connect the device to the power supply and, if required, to the network.

2 Important Directions for Use

2.1 Appropriate Use

Introduction

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 Rexroth products, make sure that all the pre-requisites 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 and Use of application

The VSB 40.1 by Rexroth is an industrial PC and becomes a PC-based operating terminal when combining it either with a VDP 16 display or VDP 40 display. Depending on the application and configuration, control functionality can be obtained.

Note: The VSB 40.1 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.

The VSB 40.1 has been developed for use in control tasks.

Typical areas of application of the VSB 40.1:

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

The VSB 40.1 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 VSB 40.1 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 VSB 40.1 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 extreme maximum temperatures or if
- Bosch Rexroth has not specifically released them for that intended purpose. Please note the specifications outlined in the general Safety Instructions

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.
  For example, the following areas of use are not permitted: 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 sensitive to high frequency, 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 five (5) 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.

DANGER

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 PC Box

PC box	Type E	
Processor	Celeron with minimum 2 GHz	
Chip set	Integrated graphic controller with maximum 8 MB video memory	
Random access memory (RAM)	512 MB / 1024 MB	
Hard disk	Min. 30 GB	
Optional drives	DVD ROM or DVD RW	
Interfaces	• 1 x G4 display interface (25-pin, D-Sub) • 1 x parallel interface (25-pin, D-Sub) • 1 x VGA connection (15-pin, HD-Sub) • 2 x USB connection (type A) • 1 x Ethernet connection (RJ 45, 10/100 Base-T) • 1 x keyboard connection (PS/2) • 1 x mouse connection (PS/2) • 1 x serial standard interface RS232 (9-pin, D-Sub) [1] •	
Slots	6 x PCI	
Voltage supply	90 ... 264 VAC	19 ... 32 VDC
Max. power consumption	330 W (for 230 VAC)	380 W (for 19 VDC)
Degree of protection	PC box: IP 20	

Fig. 4-1: Technical data: PC box

[1] Depending on the design of the UPS, this interface is required for the optionally available external UPS and might then not be available anymore to connect other devices.

4.2 Power Supply 115 V / 230 V

Nominal input voltage:	115 VAC / 230 VAC		
Input voltage range:	90 ... 264 VAC		
Input current:	2.5 A for nominal voltage 230 VAC 5.0 A for nominal voltage 115 VAC		
Inrush current:	100 A for 264 VAC		
Output voltages:	Current		Tolerances
	Min.	Max.	
+3.3 V	0,5 A	20 A	+/- 5 %
+5 V	0,5 A	25 A	+/- 5 %
+12 V	1,0 A	17 A	+/- 5 %
–12 V	0 A	0.8 A	+/-10 %
+5 V SB	0 A	2.0 A	+/- 5 %
Max. Output power:	250 W*		
Efficiency (under full load):	0.73 for 115 VAC, 0.76 for 230 VAC		

*) Note: During specifying the maximum output currents please observe that the currents separately considered are the maximum possible currents of the respective output voltage. However, it is not possible to create the maximum current from all output voltages, as the maximum total output power (= 250 W) must not be exceeded. In addition, the maximum power at +3.3 V together with +5 V must not exceed 150 W or 33 A.

Fig. 4-2: Technical data of the power supply unit 115 V / 230 V

4.3 Power Supply Unit 24 V

Nominal input voltage:	24 VDC		
Input voltage range:	19 ... 32 VDC		
Input current:	20 A for 19 VDC		
Inrush current:	5 A		
Output voltages:	Current		Tolerances
	Min.	Max.	
+3.3 V	0 A	15 A	+2.93 V ... +3.40 V
+5 V	2 A	30 A	+4.80 V ... +5.20 V
+12 V	0.1 A	15 A	+11.4 V ... +12.6 V
–12 V	0 A	2.0 A	– 11.4 V ... -12.6 V
–5 V	0 A	2.0 A	– 4.75 V ... -5.25 V
+5 V SB	0 A	1.2 A	+4.75 V ... +5.25 V
Max. output power:	300 W*		
Efficiency (under full load):	> 0,65		

*) Note: During specifying the maximum output currents please observe that the currents separately considered are the maximum possible currents of the respective output voltage. However, it is not possible to create the maximum current from all output voltages, as the maximum total output power (= 300 W) must not be exceeded. In addition, the maximum power at +3.3 V together with +5 V must not exceed 150 W.

Fig. 4-3: Technical data of the power supply unit 24 V

4.4 Ambient Conditions

	In operation	Storage / Transport
Maximum ambient temperature Exception: 230 V – UPS (see chapter 8.3)	+5 °C... +45 °C +0 °C ... +40 °C	-20 °C to +60 °C +0 °C ... +40 °C
Max. temperature gradient	Temperature change 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: 0.025 mm for 10 ... 57 Hz Acceleration: 0.25 g for 57 ... 50 Hz According to EN 60068-2-6	Max. shock: 5 g according to DIN IEC 68-2-27, function not disturbed
Degree of pollution	2	2

Fig. 4-4: Ambient conditions

4.5 Used Standards

The system components of the industrial PCs correspond to the following standards:

EN standards

Standard	Meaning
EN 60,204-1	Electrical equipment of machines
EN 50,081-2	Basic technical standard, noise immunity (industrial environment)
EN 50,082-2	Basic technical standard, emitted interference (industrial environment)
EN 60,742	Transformer for 24 V power supply unit, protective separation
EN 60,950	Overvoltage category II
EN 61131	Requirements regarding 24V outputs
EN 61 131-2	Requirements on 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
EN 60 068-2-27	Shock

Fig. 4-5: Used standards

CE Marking

Note: Concerning delivered VSB 40.1 devices all CE requirements are fulfilled. After plugging-in extension cards, however, a new CE test has to be executed.

UL/CSA certification

The devices of the VSB family are basically certified according to

- **UL508** (Industrial Control Equipment) and
- **C22.2 No. 142-M1987** (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, the following conditions have to be fulfilled:

- Use insulated copper wires suitable for at least 60/75 °C.
- Use Class 1 wire only or equivalent.

Note: The UL/CSA marking is only valid for the device in its delivery status. After modifying the device, e.g. after plugging additional extension cards, the UL compliance must be checked.

4.6 Wear Parts

Wear parts without warranty

CMOS battery: 5 to 7 years

- The **hard disk** is an electromechanical wear part, that has to be changed during the operating time. According to the manufacturer's specifications the hard disk has been developed for a service life of 60 months in consideration of the following conditions:

Operating hours / month		Max. 720
Input cycles and output cycles / month		833
Operating conditions	Temperature	< 60 °C
	Rel. humidity	< 90 %
	Height	< 3,000 m
	Accesses	50 % of the operating hours
Storage conditions	Temperature	< 70 °C
	Rel. humidity	< 95 %
	Duration	< 3 months

Fig. 4-6: Typical operating and storage conditions of the hard disk

The operation out of this typical conditions is permissible, whereby, however, the service life of the hard disk may reduce. However, the ambient conditions specified for the overall device in chapter 4.4 have to be absolutely kept. Different values apply for hard disks of some devices with special design.

- **Fans** are mechanical wear parts whose service life depends mainly on the temperature. For the fan integrated in the housing, the following service life is specified by the manufacturer:

Ambient temperature	**Service life**
40 °C	70,000 hours
70 °C	35,000 hours

Fig. 4-7: Service life of the fan

4.7 Compatibility Check

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.

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

5 Dimensions and Installation Notes

To meet the various installation requirements, the VSB 40.1 equipped with an optional drive is available as different variants. Depending on the provided clearance for the opening drive, select the VSB 40.1 as variant NN (see Fig. 5-1) or as variant LS (see Fig. 5-1) with the drive in connector direction (position 12 of type code on page 11-1).

For safe mounting of the VSB 40.1 in variant NN, e. g. in a control cabinet two times four fastening holes are provided at the integrated mounting brackets, so that the VSB 40.1 can be horizontally or vertically mounted. The VSB 40.1 as variant LS with drive in connector direction has four mounting holes.

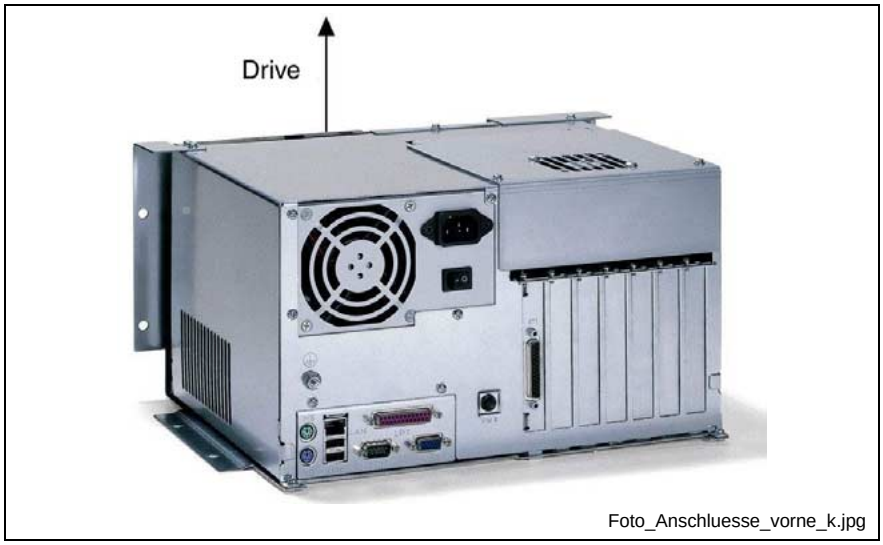

Fig. 5-1: VSB 40.1 as variant NN

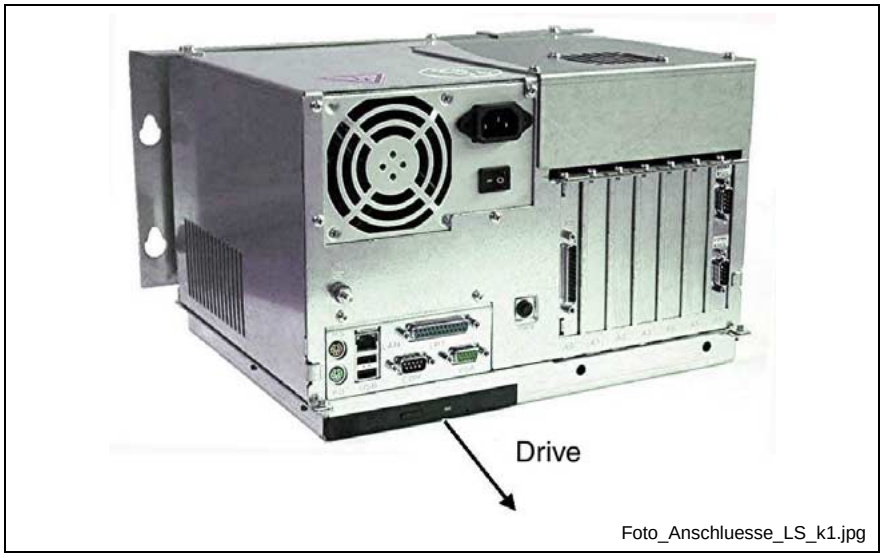

Fig. 5-2: VSB 40.1 as variant LS (drive in connector direction)

Each horizontal and vertical mounting direction is permissible. However, Bosch Rexroth recommends the mounting directions illustrated below.

The space required for all the installation positions of connectors and cables as well as for the opening drive is to be considered at any time. A space of at least 50 mm is required on all sides in order to guarantee a sufficient cooling of the VSB 40.1

5.1 Mounting the VSB 40.1, Variant NN

Horizontal Mounting with Connector Panel in Forward Direction

Fig. 5-3: Connector panel in forward direction, optional drive at the top

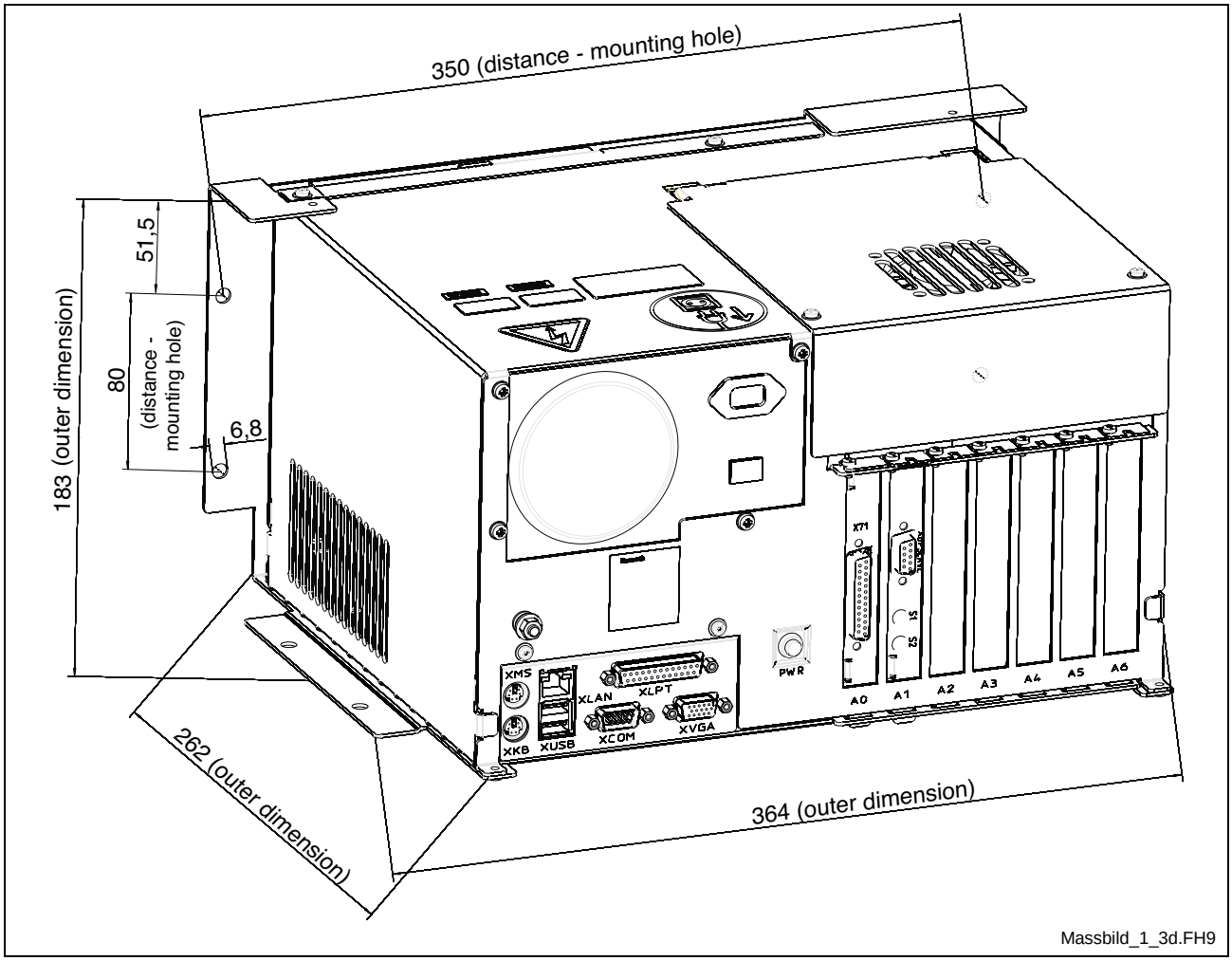

Fig. 5-4: Dimensions for horizontal mounting with connector panel in forward direction

Vertical Mounting with Connector Panel in Forward Direction

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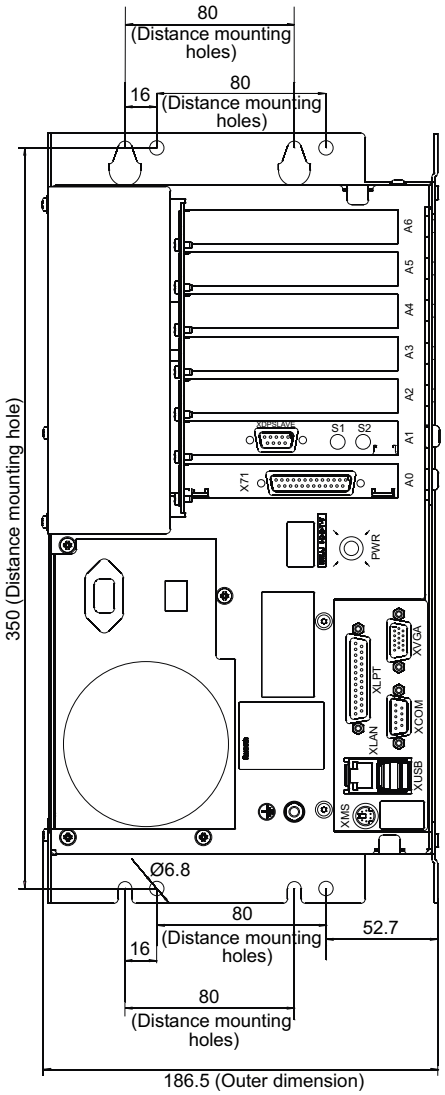
Fig. 5-5: Vertical Mounting with Connector Panel in Forward Direction



massbild_4_3d.FH11

Fig. 5-6: Mounting specifications for vertical mounting with connector panel in forward direction

Mounting with Connector Panel on the Top Side

Fig. 5-7: Connector panel on the top side, optional drive in forward direction

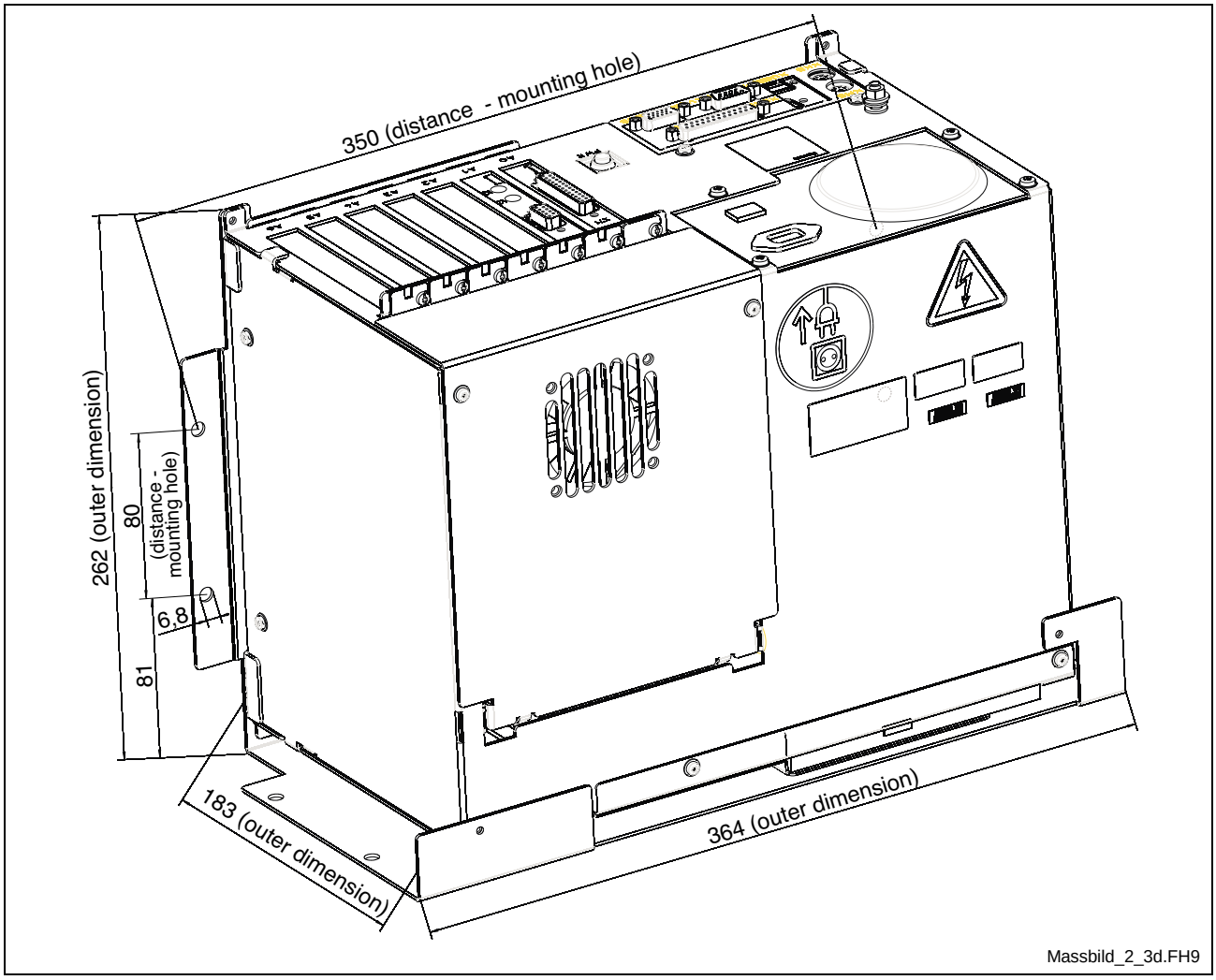


Fig. 5-8: Dimensions when mounting the connector panel on the top side

5.2 Mounting the VSB 40.1, Variant LS

Mounting with Connector Panel in Forward Direction

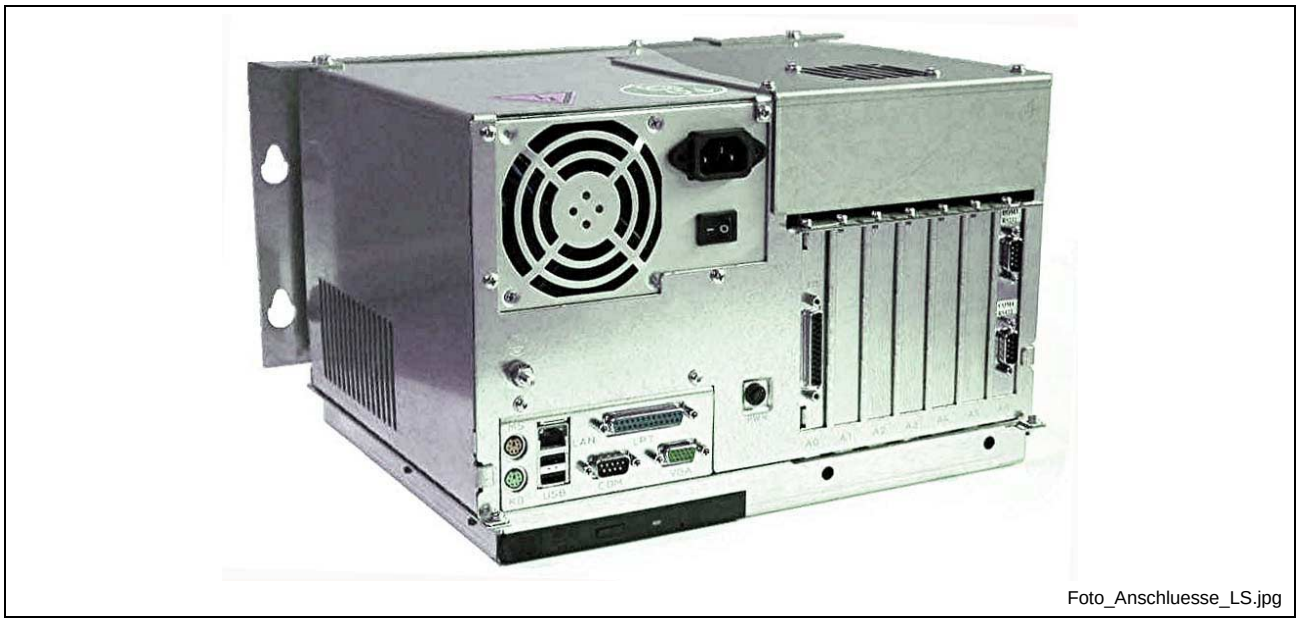


Fig. 5-9: Mounting with connector panel in forward direction

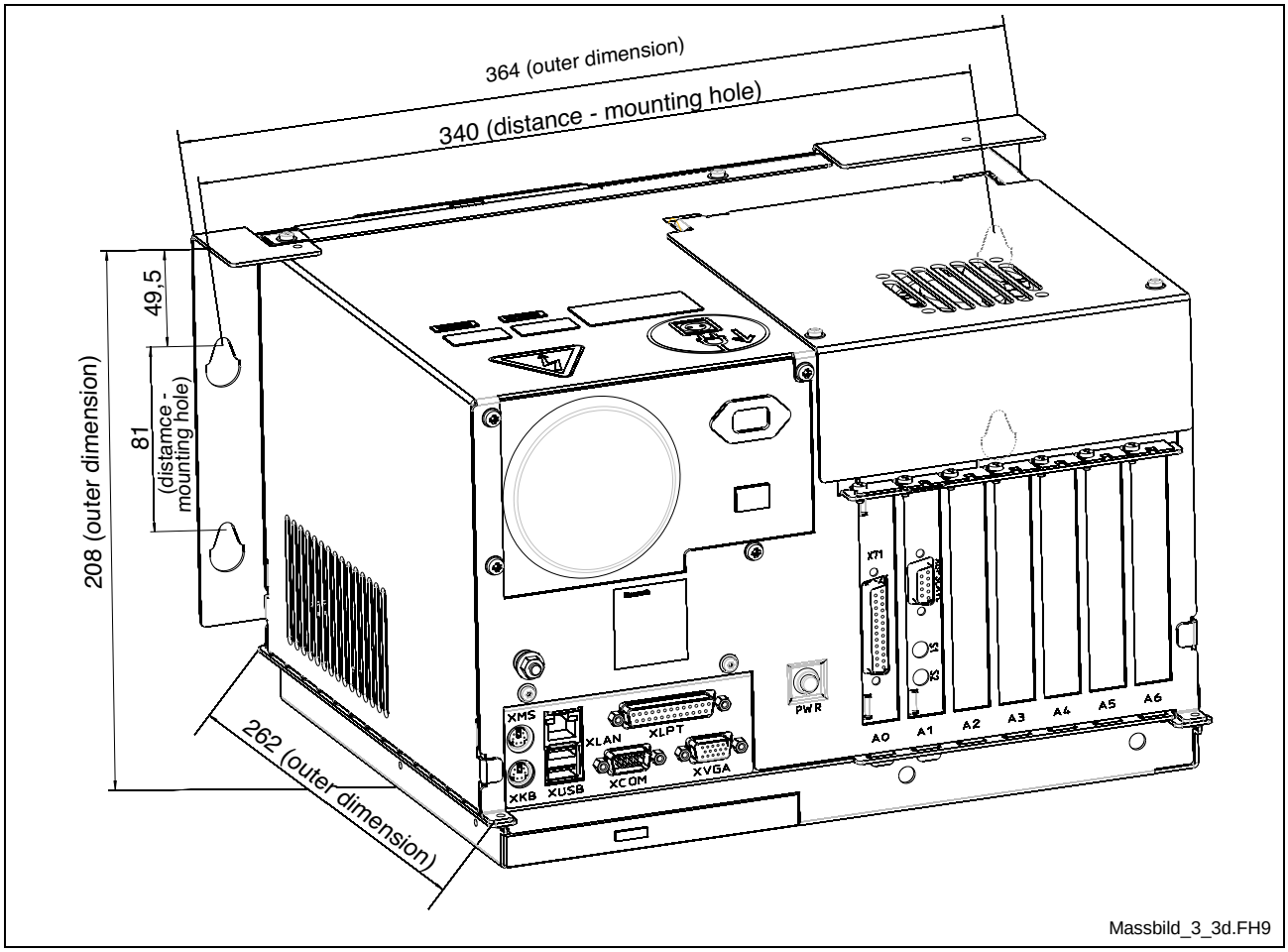


Fig. 5-10: Dimensions when mounting the connector panel on the front

5.3 Installation Notes

- Avoid installation locations exposed to direct sunlight, as additional heat development can occur.
- When determining installation location and mounting position observe, that the optionally available drive can be opened unobstructed.
- Install the VSB in a manner ensuring easy access to the connector panel.
- Provide a sufficient clearance of 50 mm (on all sides) for cooling and cable routing behind the device.
- Lay all connecting cables in loops and use strain reliefs for all cables.
- Keep as much distance as possible to noise sources.
- Fasten the VSB with four screws M6 at the integrated mounting brackets.

6 Display and Operating Components

6.1 Power Button

Besides the connector panel (see Fig. 7-1) a button labeled with "PWR" is provided.

Usually, this power button has no function, as the VSB 40.1 is started by applying the supply voltage. This is preset in BIOS. If the BIOS setting has been modified by accident, the VSB 40.1 can be started by pressing this button.

To reset the original status, in which the VSB 40.1 also starts without pressing the power button immediately after applying the supply voltage, activate the BIOS setup during the booting process with the <Entf> or <DEL> key. There, activate menu "Power Management Setup". Select in this menu under item "PWRON After PWR-Fail" the setting "[Former-Sts]".

6.2 Display, Monitor and Keyboard

Display

To display and operate the VSB 40.1 we recommend the displays VDP 16 and VDP 40 especially designed by Bosch Rexroth for industrial applications. The displays are connected with the VSB 40.1 via the G4 display interface. Hence, you can install the display 30 meters away or more from the PC. The VDP-type displays are equipped either with a keypad or with a touch screen.

Note: Detailed information can be found in the corresponding documentation of the VDP 16 device and the VDP 40.

You can also connect mouse and keyboard to this displays.

VGA Monitor

You can connect a standard monitor (female connector XVGA), a PS2 keyboard (female connector XKB) and a PS2 mouse (female connector XMS) with the VSB 40.1.

Note: If a VDP is used, keyboard and mouse can be connected to it only. The interface for keyboard and mouse must remain free.

Selection of the Graphic Driver

When the VSB device is delivered, the settings allow to trigger both a connected monitor and a connected VDP.

Activation of the VDP or the external monitor

If required, you can select, if the VDP connected with the G4 display interface, the external monitor operated at the VGA connection or both can be addressed:

1. Select "Intel(R) Extreme Graphics" in the task bar.

Fig. 6-1: Intel Extreme Graphics

2. Chose "Graphics Options" -> "Graphics Properties".

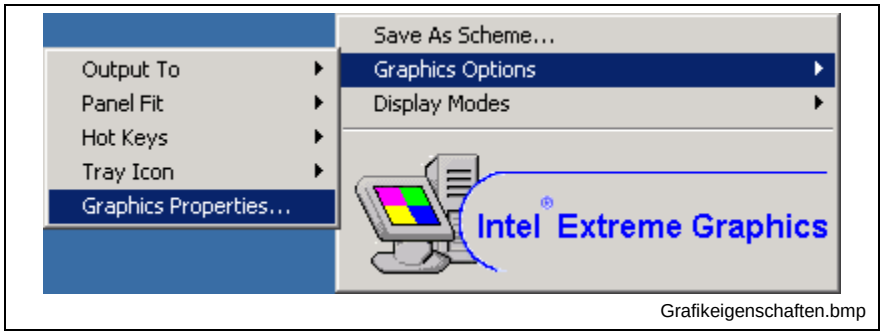


Fig. 6-2: Graphics Properties

3. The "Intel ... Graphics Controller Properties" window opens. Select "Devices".

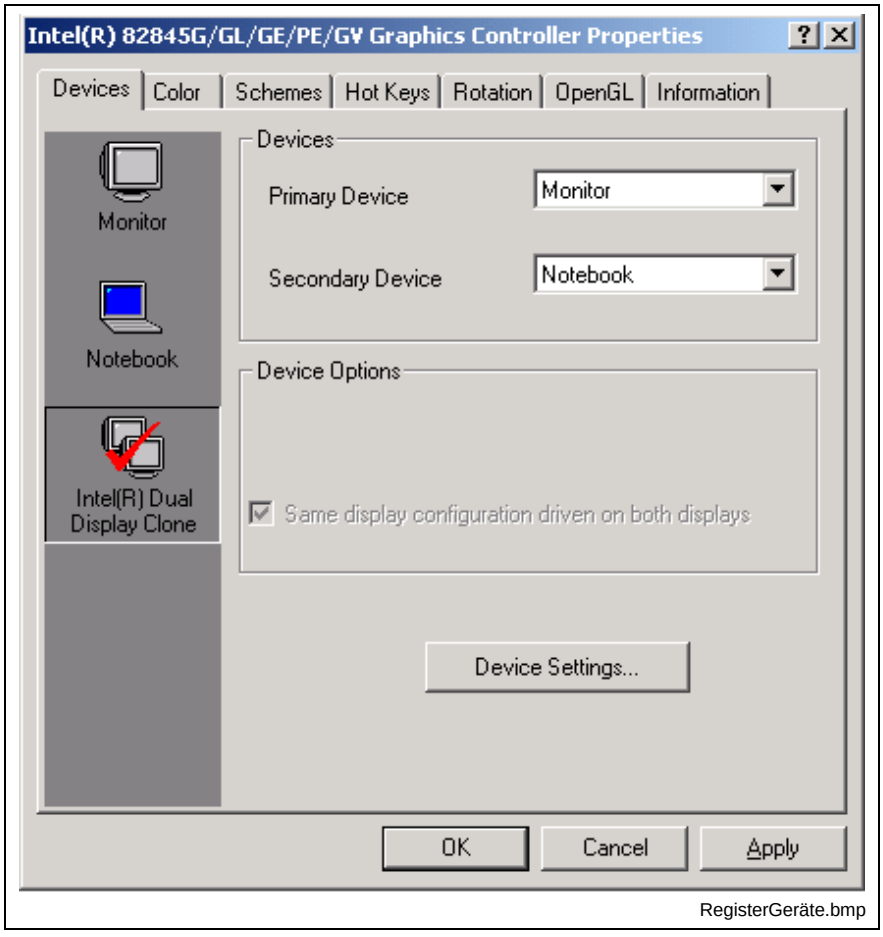
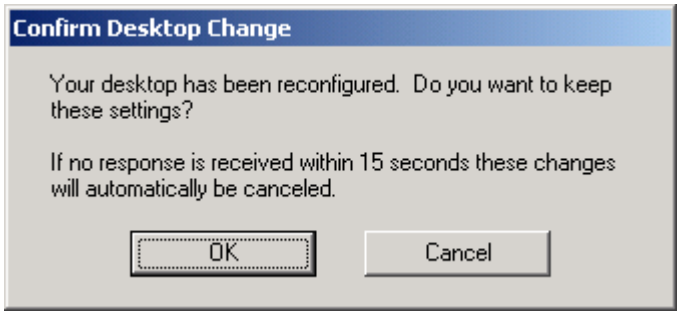


Fig. 6-3: "Devices"

4. If an external monitor is connected, you can select on the left side by clicking on the corresponding icons, if you want to address only the external monitor (select "Monitor"), only the screen of the connected VDPs (select "Notebook") or both screens (select "Intel(R) Dual Display Clone").
5. After confirming using <OK>, another window opens where the selection is to be reconfirmed by pressing <OK>. Otherwise, the monitor selection is not applied.



Bestätigen.bmp

Fig. 6-4: Confirm Desktop Change

Note: If the connected external monitor or the connected VDP is black, as the corresponding graphic driver is not activated, you can also select the desired action blindly by using the key combinations illustrated in the figure on the next page in the "Hot Keys" tab.

Thereby, "Monitor" corresponds to the external monitor and "Notebook" to the VDP.

The key combinations can only be activated, if a user is logged in.

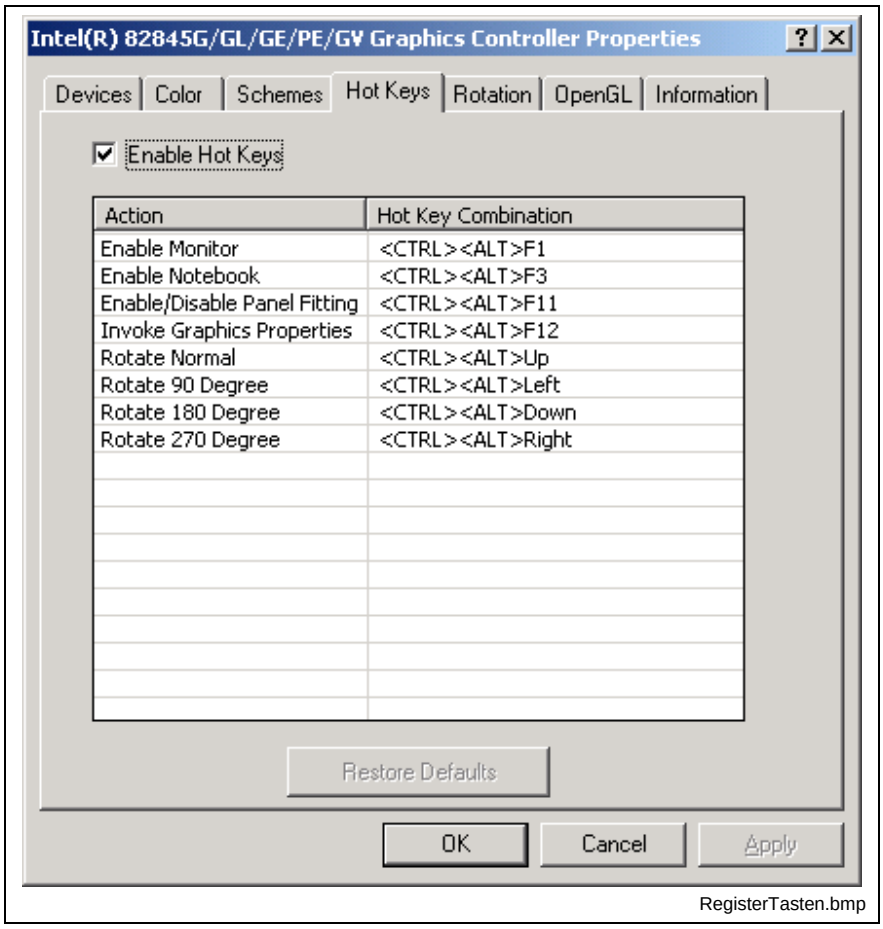


Fig. 6-5: “Hot Keys“

7 PC Box

7.1 View on the Connector Panel

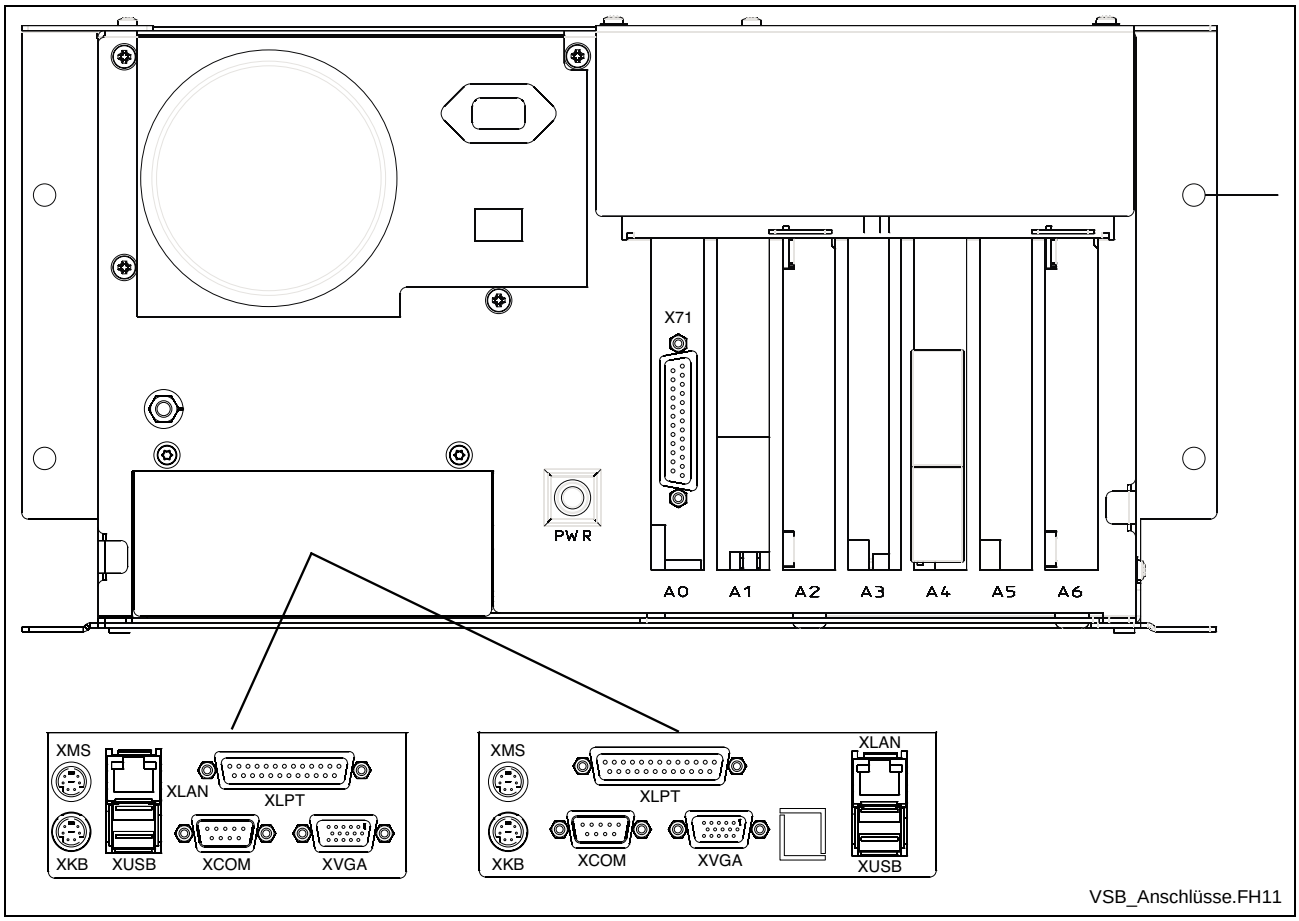


Fig. 7-1: Position of connections of both the different designs

7.2 Interfaces

Note: Malfunctions caused by insufficient shielding! Use only shielded cables and metallic/conductive connector or coupling covers with large-area screen contact.

Overview

	Des. on the housing	Connection type	Connector type (integrated)	Mating connector or cable (from outside)
o	XCOM	Serial interface: RS232 (UART 16550), not assigned	D-Sub male connector, 9-pin	D-Sub female connector, 9-pin
o	XLPT	Parallel interface: supports standard SPP-, EPP-, ECP-mode	D-Sub female connector, 25-pin	D-Sub male connector, 25-pin (e. g. printer cable)
o	XUSB	2 USB interfaces	USB female connector, 4-pin, type A	USB male connector, 4-pin
o	XLAN	Network connection: Ethernet 10Base T / 100Base X	RJ45 female connector, 8-pin	RJ45 connector (twisted pair, 8-core)
o	XVGA	VGA connection of an external CRT monitor	VGA HD female connector, 15-pin	VGA HD male connector, 15-pin
o	XKB	PS/2 keyboard	Mini-DIN PS/2 female connector, 6-pin	Mini-DIN PS/2 male connector, 6-pin
o	XMS	PS/2 mouse	Mini-DIN PS/2 female connector, 6-pin	Mini-DIN PS/2 male connector, 6-pin
A 0	X71	G4 display interface (for VDP 16 or VDP 40)	D-Sub female connector, 25-pin	D-Sub male connector, 25-pin
		Alternative power supply:		
o		PC power supply: 24 VDC	Screw terminal	
o		PC power supply: 230/115 VAC	AC male connector	AC female connector

Connection point: o= Top side of the housing, A0= Plug-in card on slot A0

Fig. 7-2: Connector types VSB 40.1

Serial Interface XCOM

XCOM - Serial interface

A serial standard interface is provided at connection XCOM.

D-Sub male connector, 9-pin	
Type:	RS232
Cable length:	15 m max.
Cable type:	Shielded, cross section min. 0.14 mm²
Transmission rate:	Max. 115200 bits/s
Handshake:	Hardware and software handshake (XON, XOFF)
Interrupt (IRQ):	4
I/O address:	AUTO (or 3F8H)
BIOS presettings:	Enabled

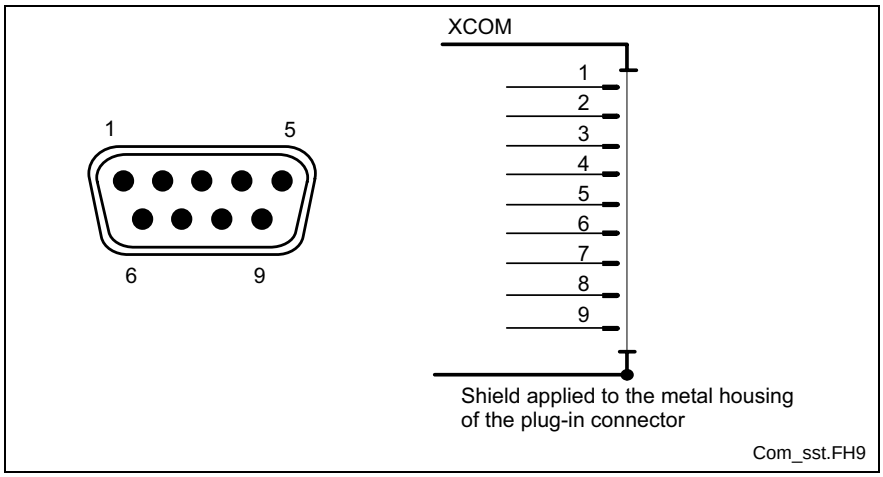


Fig. 7-3: Pin assignment COM

Note: Depending on the design, the UPS available as accessory this interface might be needed for the communication with the UPS.

Settings of the Serial Interface

Control Panel

To find out settings of the transfer parameters for the serial interfaces, please refer to the description of the installed operating system (for Windows under Settings/Control Panel, ...").

BIOS

The standard BIOS setting of COM (Serial Port A) is **AUTO** (automatic parameter assignment). Apply the following settings if the parameter should be assigned directly:

- COM = 3F8H

Note: Interrupt (IRQ) and I/O address must coincide with the settings made in BIOS.

Parallel Interface XLPT

XLPT – Parallel Interface for Printer, Scanner, etc.

D-Sub female connector, 25-pin	
Type:	SPP (ex works), EPP, ECP
Cable length:	3 m max.
Cable type:	Shielded, cross section min. 0.14 mm²
Interrupt (IRQ):	7
I/O address:	AUTO or 378H (recommended)

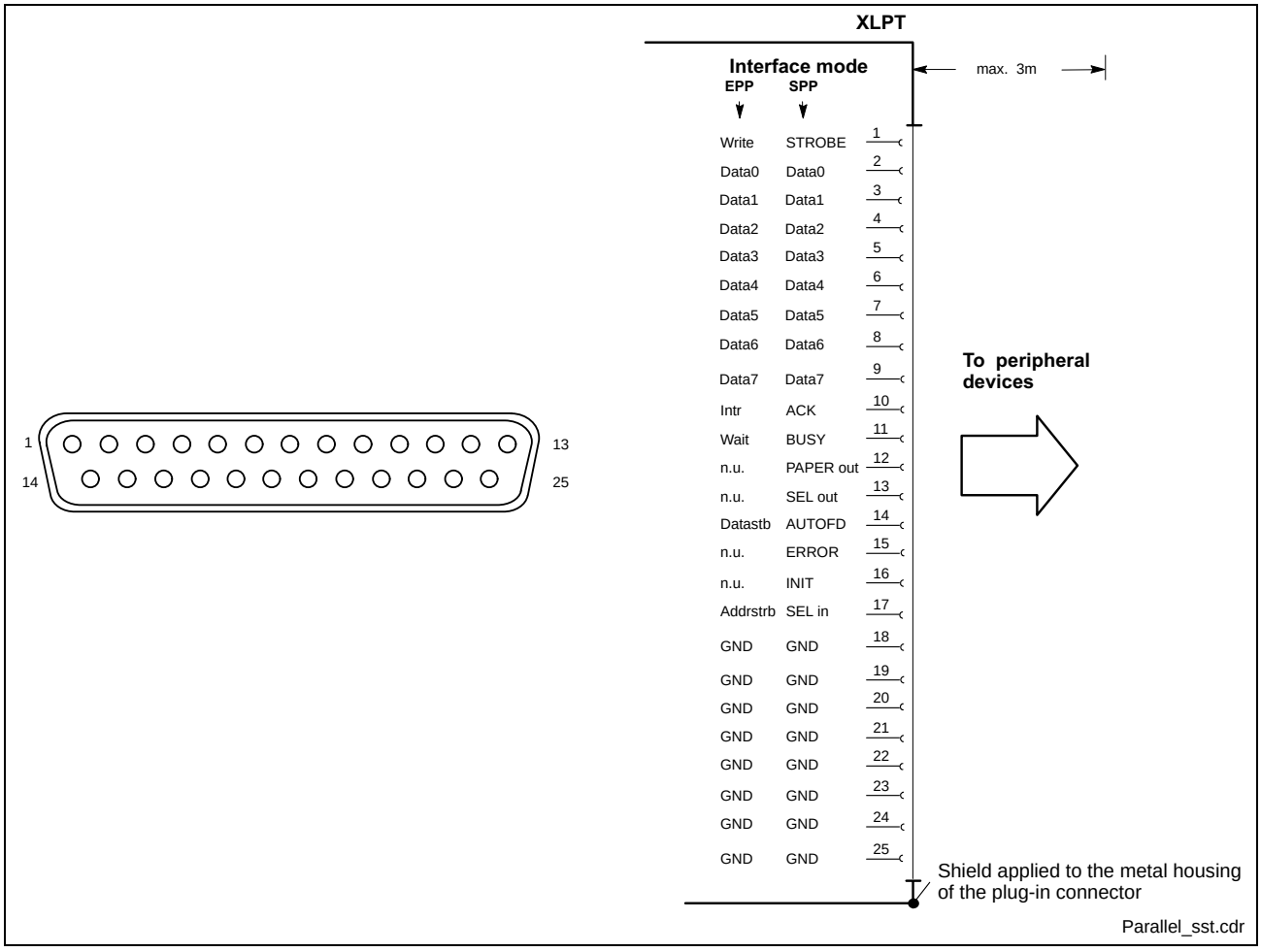


Fig. 7-4: LPT interface

The parallel interface normally runs in the standard mode SPP. Furthermore, it can be operated in the EPP mode (Enhanced Parallel Port) or in the ECP mode (Extended Capabilities Port), if the suitable peripheral equipment is available. The mode can be changed in the BIOS settings.

XUSB Interfaces

XUSB – serial interfaces for printer, scanner, CD-ROM drive

The devices feature two USB interfaces on the connector panel (XUSB). These interfaces are compatible to USB 1.1 and USB 2.0.

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

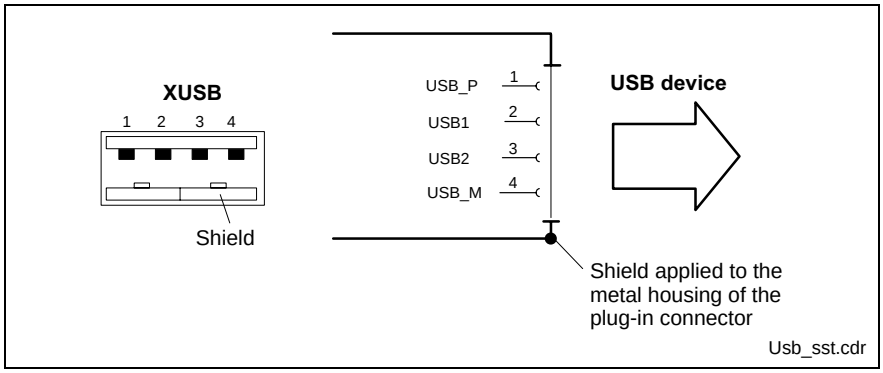


Fig. 7-5: USB Interfaces

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

Ethernet Interface XLAN

XLAN – Network Connection

The industrial PC can be connected with an Ethernet network via an Ethernet interface XLAN.

RJ45 female connector, 8-pin	
Type:	Ethernet 10Base T / 100Base X
Cable length:	100 m max.
Cable type:	Shielded, twisted pair
Transmission rate:	10 or 100 Mbits/s

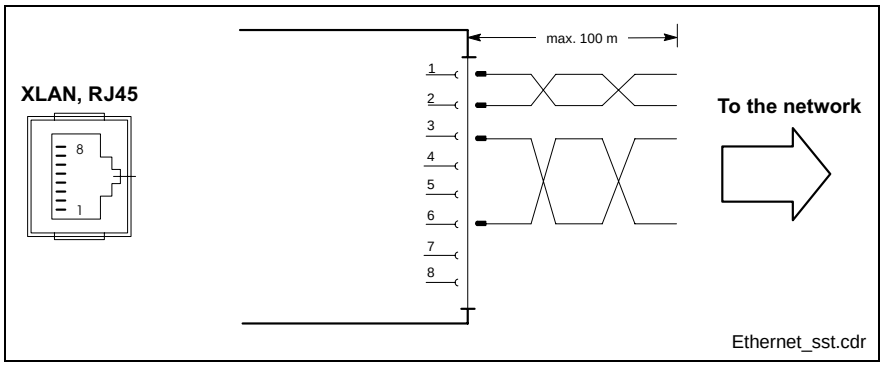


Fig. 7-6: Ethernet interface XLAN

The driver configuration of the network connection can be called up in the task bar or in the "Control Panel" with icon "Network Board". Here you can set among other values, if the data transmission shall occur with 10 Mbits/s and/or with 100 Mbits/s.

Note: Please observe that the network board of the outstation has to be able to process the same data transmission rate.

XVGA Interface

XVGA – Connection for external monitor

An external monitor (CRT) can be connected to the VGA connection (XVGA) and can be operated as an alternative or parallel to a VDP connected via the G4 display interface.

- Video RAM: 8 MB max.

Note: Before plugging-in a graphics card the video adapter integrated in BIOS has to be switched off.

HD female connector, 15-pin	
Cable length:	1.5 m max.
Cable type:	Shielded, cross section min. 0.14 mm²
Max. resolution:	1600 x 1200 pixels, max. 4294 mill. colors

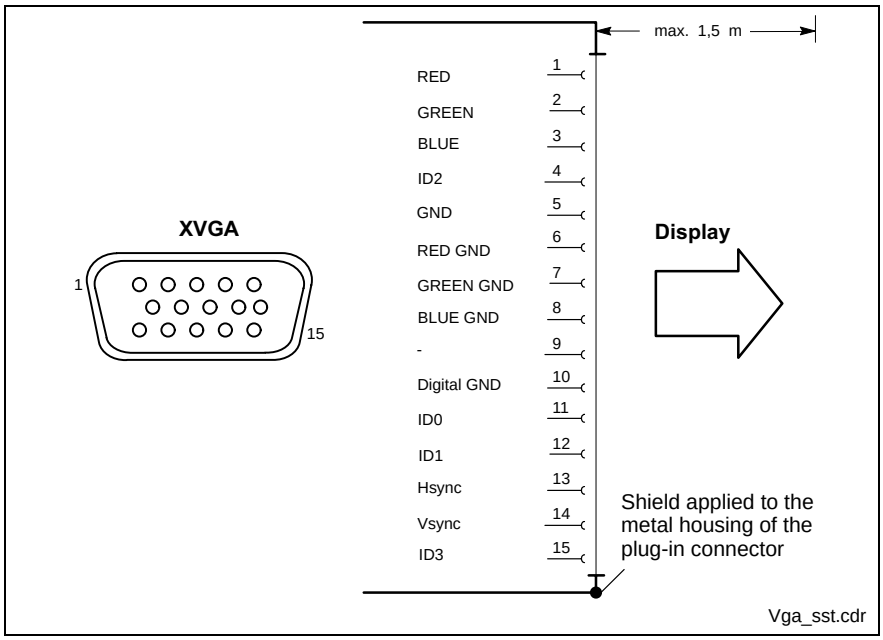


Fig. 7-7: VGA interface

CAUTION!

Setting incorrect resolutions and colors may destroy your monitor!

⇒ Please observe the technical data of your monitor and adapt the operating system parameters accordingly.

Recommended monitors for external use are low-radiation models according to TCO95. In addition, you should achieve the desired display resolution with a refresh rate of at least 72 Hz.

Note: When the VSB device is delivered, the settings allow to trigger both a connected monitor and a connected VDP.

How to change this selection, if required, is described in section "Selection of the Graphic Driver" on page 6-1.

Keyboard Interface XKB

XKB – PS/2 Mini DIN Keyboard / Mouse Interface

PS/2 Mini DIN female connector, 6-pin	
Cable length:	1.5 m max.
Cable type:	Shielded, cross section min. 0.14 mm²

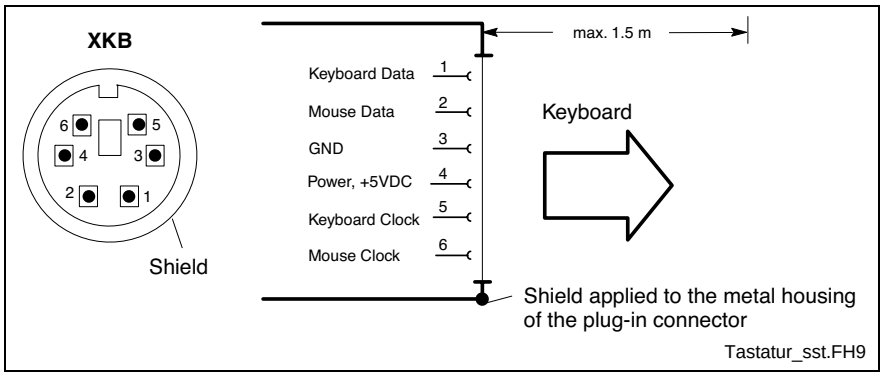


Fig. 7-8: Keyboard interface

Note: If a VDP display is connected to a VSB 40, the keyboard can only be connected to this one. The keyboard interface XKB at the VSB 40.1 has to remain free.

Mouse Interface XMouse

XMouse – PS/2 Mouse Interface

PS/2 Mini DIN female connector, 6-pin	
Cable length:	1.5 m max.
Cable type:	Shielded, cross section min. 0.14 mm²
Interrupt (IRQ):	12
BIOS presettings:	PS/2 mouse support: Enabled PS/2 mouse: Auto detect

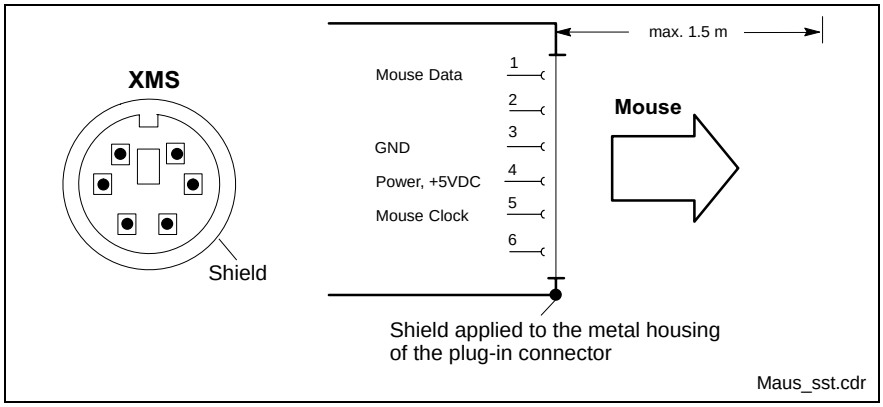


Fig. 7-9: Mouse interface XMS

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 used by another PC extension card, you should change the IRQ of this extension card to another IRQ, that is still not-assigned.

Note: If a VDP display is connected to a VSB 40, the mouse can only be connected to this one. The mouse interface XMS at the VSB 40.1 has to remain free.

G4 Display Interface X71

X71 – G4 display interface

The G4 display interface is assigned to the 25-pin D-Sub female connector X71. To this female connector you connect via a ready-made cable available as accessory (see page 11-2) a display VDP 16 or VDP 40.

Note: When the VSB device is delivered, the settings allow to trigger both a connected monitor and a connected VDP.

How to change this selection, if required, is described in section "Selection of the Graphic Driver" on page 6-1.

PC Power Supply

24 VDC Power Supply

This screw connection is used for device variants for 24 VDC. All internally required voltages are generated from the 24 VDC supply.

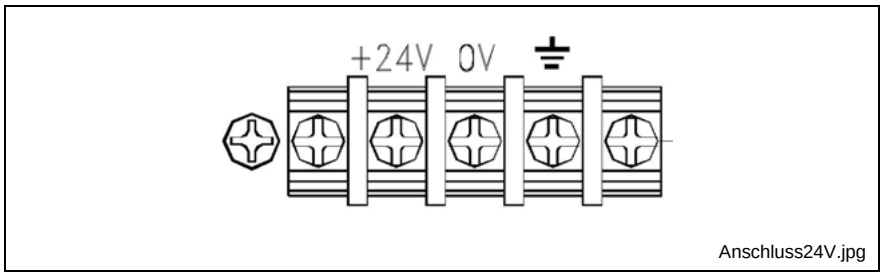


Fig. 7-10: Connection terminal for the 24 VDC supply

Note: Only copper wire is to be used to connect these terminals. Tighten the screws of the screw terminals with a torque of 0.4 Nm (1.81 kg in).

Parameters	Value
Input voltage U_N	24 VDC ; (19 ... 32 VDC)
Residual ripple for U_N	See figure on the following page
Power consumption for 19 VDC	20 A max.
Overload protection	Deactivation with automatic restart
Short-circuit protection	Deactivation with automatic restart

Fig. 7-11: Technical data 24 VDC connection

DANGER

Danger without protective separation!

⇒ The 24 VDC input voltage must comply with the requirements of the "Protective separation".

⇒ Plug and unplug the connector only in no-voltage condition!

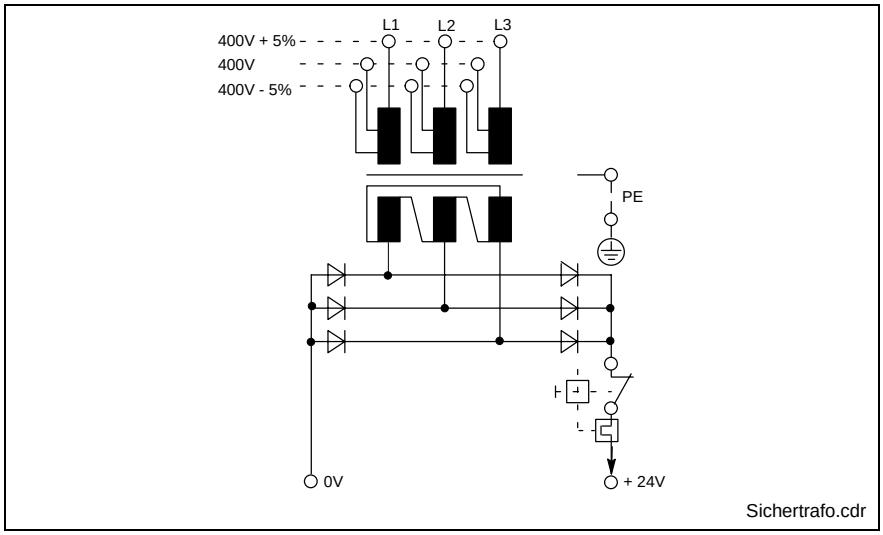


Fig. 7-12: Safety transformer according to EN 60742

Interfering AC voltage components such as resulting from an uncontrolled 3-phase current bridge connection without smoothing with a ripple factor (see DIN 40110/10.75, section 1.2) of 5 % are permissible.

It follows from the above that as upper voltage limit the greatest absolute value is 30.2 V and as lower voltage limit the lowest absolute value is 18.5 V.

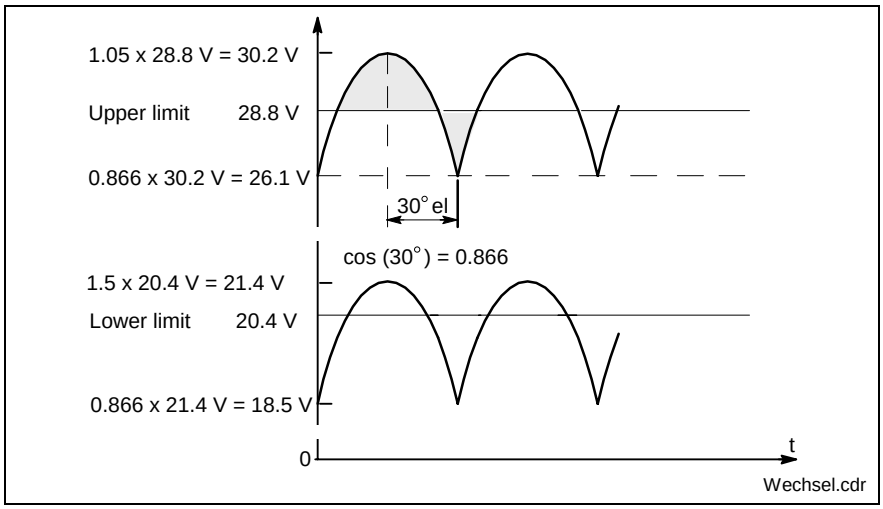


Fig. 7-13: Illustration of the limit values for the 24 VDC voltage

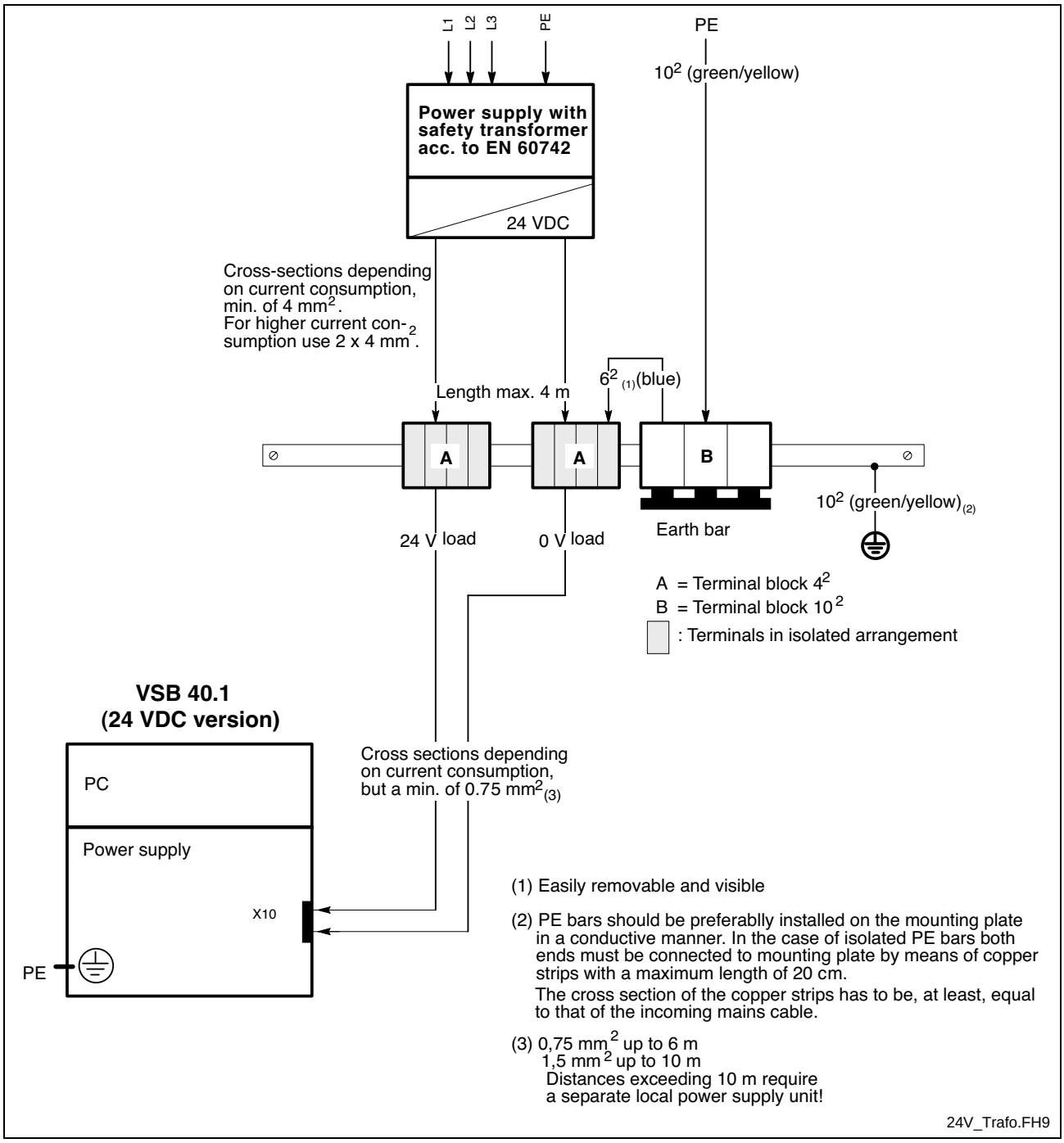


Fig. 7-14: Wiring of the power connection 24 VDC to the VSB 40.1

230/115 VAC Power Supply

This connection is used for device variants for 230/115 VAC.

All internally required voltages are generated by the 230/115 VAC power supply unit.

CAUTION

The supply voltage must comply with overvoltage category II! Otherwise the integrated power supply unit might be destructed.

⇒ Use an isolating transformer to generate the 230/115 VAC (see following page).

The 230/115 VAC connection occurs via a 3-pin inlet connector for AC connectors on the connector panel. The maximum cable cross section for the connected cables is 1.5 mm^2.

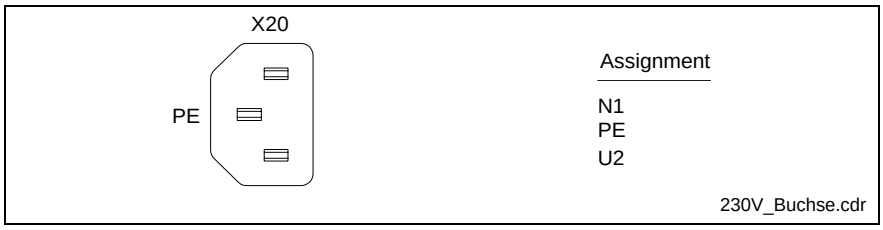


Fig. 7-15: Pin assignment of the 230/115 VAC connection X20

Parameters	Value
Rated voltage	85 VAC ... 264 VAC auto range
Power consumption for U_N = 230 VAC	2.5 A
Power consumption for U_N = 115 VAC	5 A
Inrush current for 264 VAC	100 A
Overload protection	As of 135 %, deactivation
Short-circuit protection	At all outputs, deactivation

Fig. 7-16: Technical data 115/230 VAC connection

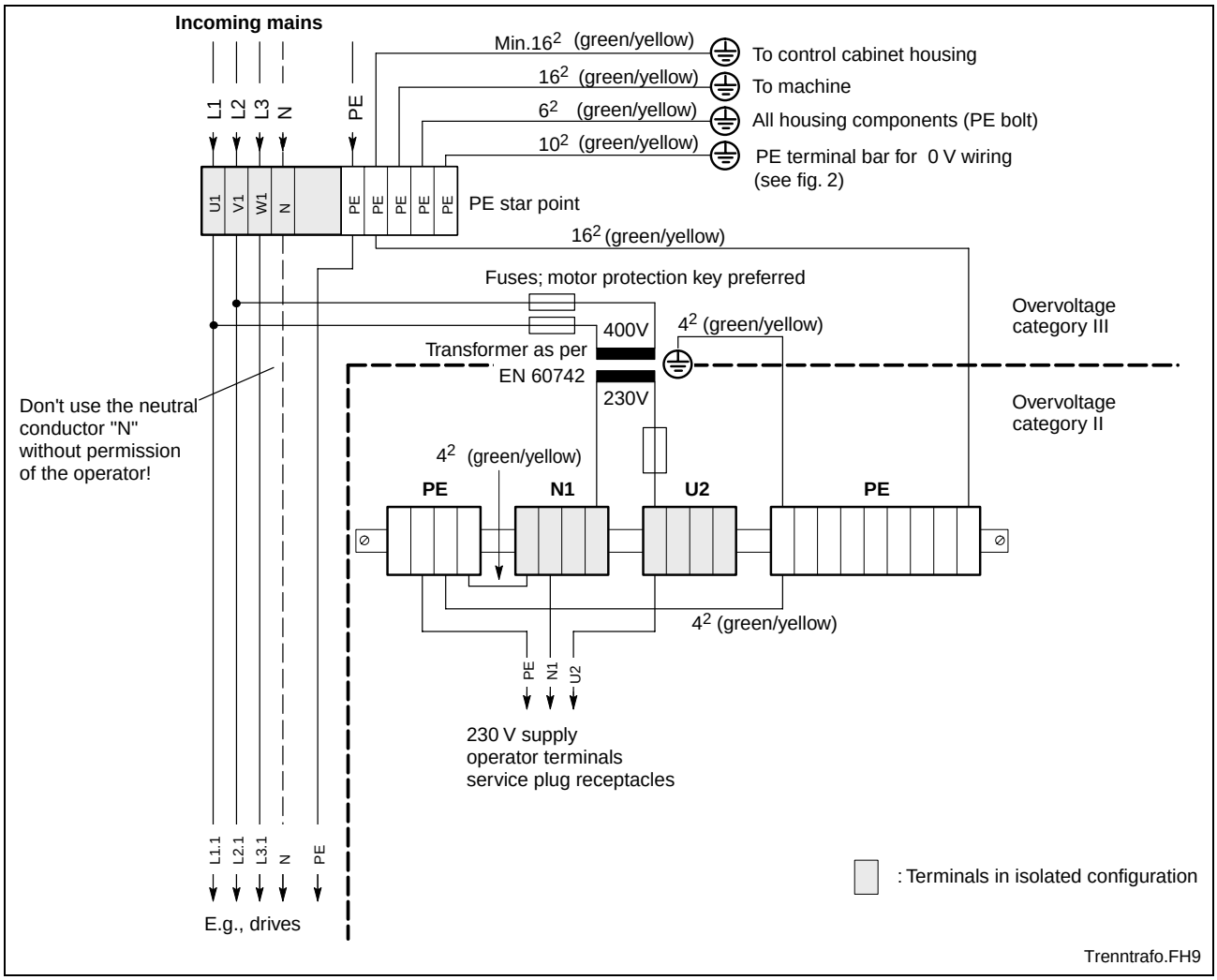


Fig. 7-17: Voltage connection 230 VAC via isolating transformer

7.3 Optional Serial Interfaces

According to the configuration, serial interfaces are available for the extension cards A5 and A6 on the slots.

The interfaces have different pin assignments and signal assignments. Before using the interfaces, identify the type assignment or pin assignment, see the configuration sticker on the device (CFG-VSN01E1-xx-xx-xx-xx-xx-xx).

CFG-VSN01E1-NN-NN-NN-NN-NN-S3 Serial Interface RS232

XCOM4 on Slot for Extension Card A6

Pin	Assignment
1	DCD (Data Carrier Detect)
2	RX (Receive Data)
3	TX (Transmit Data)
4	DTR (Data Terminal Ready)
5	Signal Ground
6	DSR (Data Set Ready)
7	RTS (Request to Send)
8	CTS (Clear to Send)
9	RI (Ring Indicator)

Fig. 7-18: Pin assignment RS232, D-sub male connector, 9-pin

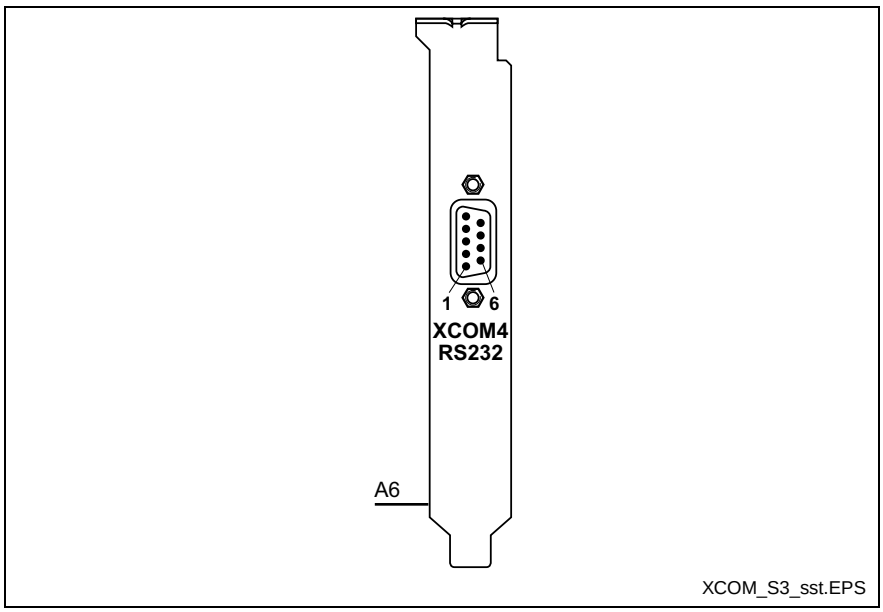


Fig. 7-19: Serial interface adapter XCOM4 on slot for extension card A6

CFG-VSN01E1-NN-NN-NN-NN-S3-S3
Serial Interface RS232

XCOM3 on Slot for Extension Card A5

Pin	Assignment
1	DCD (Data Carrier Detect)
2	RX (Receive Data)
3	TX (Transmit Data)
4	DTR (Data Terminal Ready)
5	Signal Ground
6	DSR (Data Set Ready)
7	RTS (Request to Send)
8	CTS (Clear to Send)
9	RI (Ring Indicator)

Fig. 7-20: Pin assignment RS232, D-sub male connector, 9-pin

XCOM4 on Slot for Extension Card A6

Pin	Assignment
1	DCD (Data Carrier Detect)
2	RX (Receive Data)
3	TX (Transmit Data)
4	DTR (Data Terminal Ready)
5	Signal Ground
6	DSR (Data Set Ready)
7	RTS (Request to Send)
8	CTS (Clear to Send)
9	RI (Ring Indicator)

Fig. 7-21: Pin assignment RS232, D-sub male connector, 9-pin

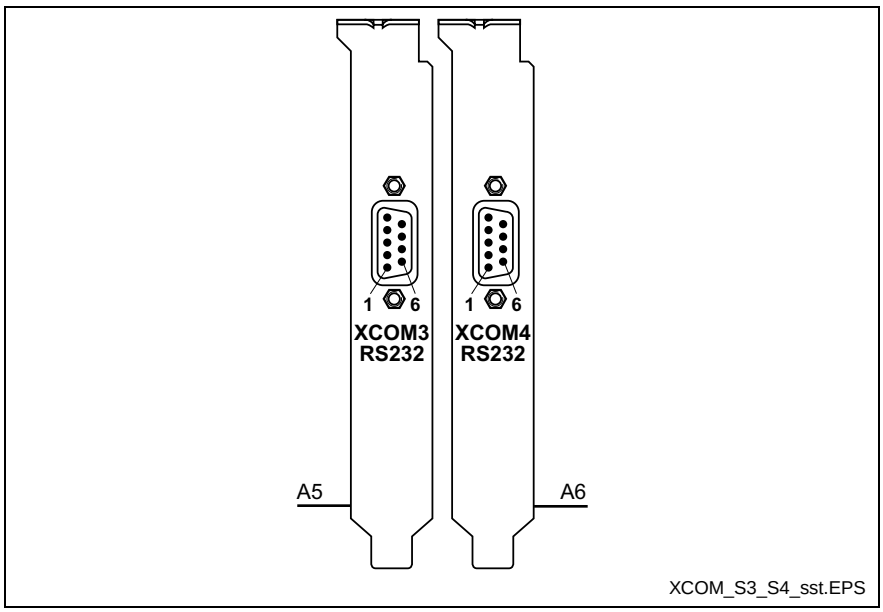


Fig. 7-22: Serial interface adapters XCOM3 and XCOM4 on the slots for the extension cards A5 and A6

CFG-VSN01E1-NN-NN-NN-NN-NN-S2
Serial Interfaces RS232 and RS422

XCOM4 on Slot for Extension Card A6

Pin	Assignment
1	DCD (Data Carrier Detect)
2	RX (Receive Data)
3	TX (Transmit Data)
4	DTR (Data Terminal Ready)
5	Signal Ground
6	DSR (Data Set Ready)
7	RTS (Request to Send)
8	CTS (Clear to Send)
9	RI (Ring Indicator)

Fig. 7-23: Pin assignment RS232, D-sub male connector, 9-pin

XCOM4 on Slot for Extension Card A6

Pin	Assignment
1	TXD- (Transmit Data-)
2	TXD+ (Transmit Data+)
3	RXD- (Receive Data-)
4	RXD+ (Receive Data+)
5	Ground

Fig. 7-24: Pin assignment RS 422, D-sub male connector, 9-pin

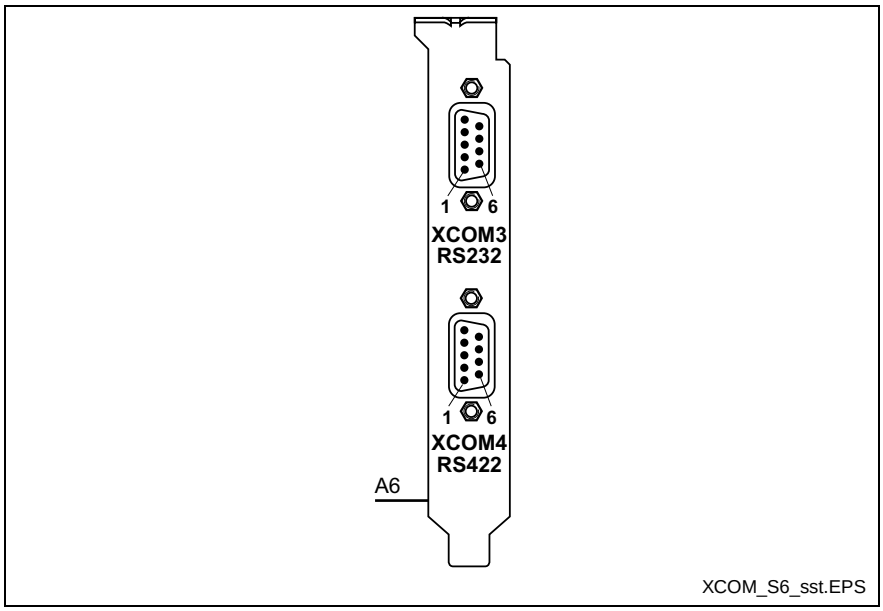


Fig. 7-25: Serial interface adapters XCOM3 and XCOM4 on slot for extension card A6

Note: There is no uniform and standard pin assignment for RS422. When connecting RS422 devices, the pinout in the documentation is to be considered.

Jumper Setting on Motherboard

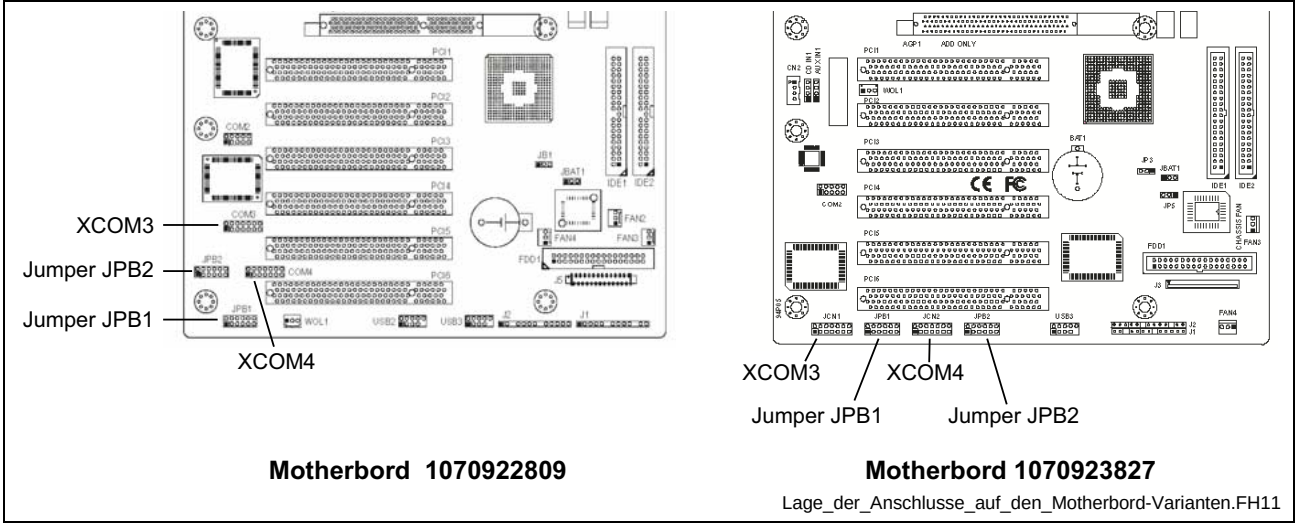


Fig. 7-26: Position of the connections and the jumper on the motherboard variants

XCOM3	Motherboard 1070922809 = Jumper JPB2 Motherboard 1070923827 = Jumper JPB1					
	1-2	3-4	5-6	7-8	9-10	11-12
RS232	OFF	OFF	OFF	OFF	OFF	ON

XCOM4	Motherboard 1070922809 = Jumper JPB1 Motherboard 1070923827 = Jumper JPB2					
	1-2	3-4	5-6	7-8	9-10	11-12
RS422	OFF ON (Term.)	OFF ON (Term.)	OFF	ON	ON	OFF

Jumper 1-2 ON = Termination 120 ohm between RXD+ and RXD-
Jumper 2-3 ON = Termination 120 ohm between TXD+ and TXD-

Fig. 7-27: Jumper positions for termination settings

CFG-VSN01E1-NN-NN-NN-NN-NN-S6
Serial Interfaces RS232 and RS422 (Rexroth Standard)

XCOM4 on Slot for Extension Card A6

Pin	Assignment
1	DCD (Data Carrier Detect)
2	RX (Receive Data)
3	TX (Transmit Data)
4	DTR (Data Terminal Ready)
5	Signal Ground
6	DSR (Data Set Ready)
7	RTS (Request to Send)
8	CTS (Clear to Send)
9	RI (Ring Indicator)

Fig. 7-28: Pin assignment RS232, D-sub male connector, 9-pin

XCOM4 on Slot for Extension Card A6

Pin	Assignment
2	RXD- (Receive Data-)
3	TXD- (Transmit Data-)
5	Ground
7	RXD+ (Receive Data+)
8	TXD+ (Transmit Data+)

Fig. 7-29: Pin assignment RS422 (here the Rexroth standard assignment), D-sub connector, 9-pin

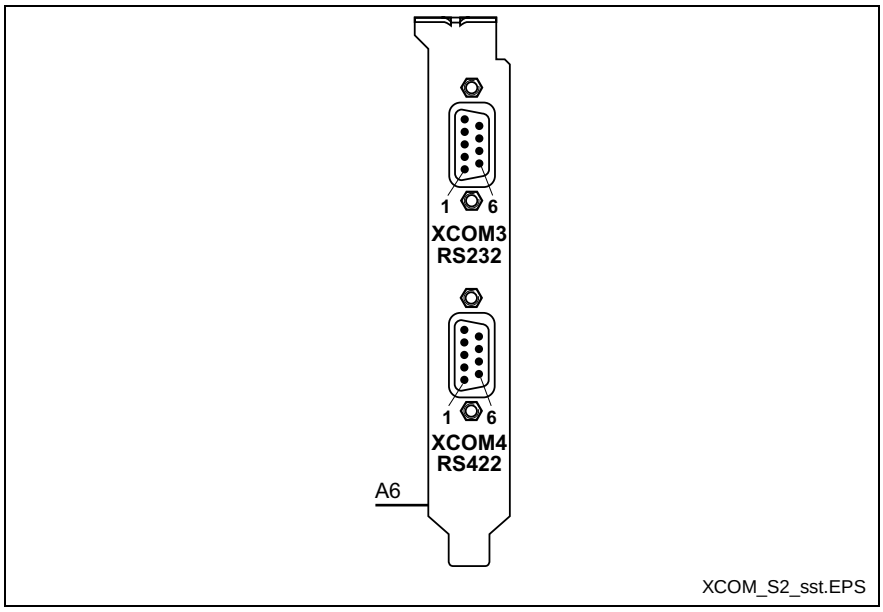


Fig. 7-30: Serial interface adapters XCOM3 and XCOM4 on slot for extension card A6

Note: There is no uniform and standard pin assignment for RS422. When connecting RS422 devices, the pinout in the documentation is always to be considered.

Jumper Setting on Motherboard

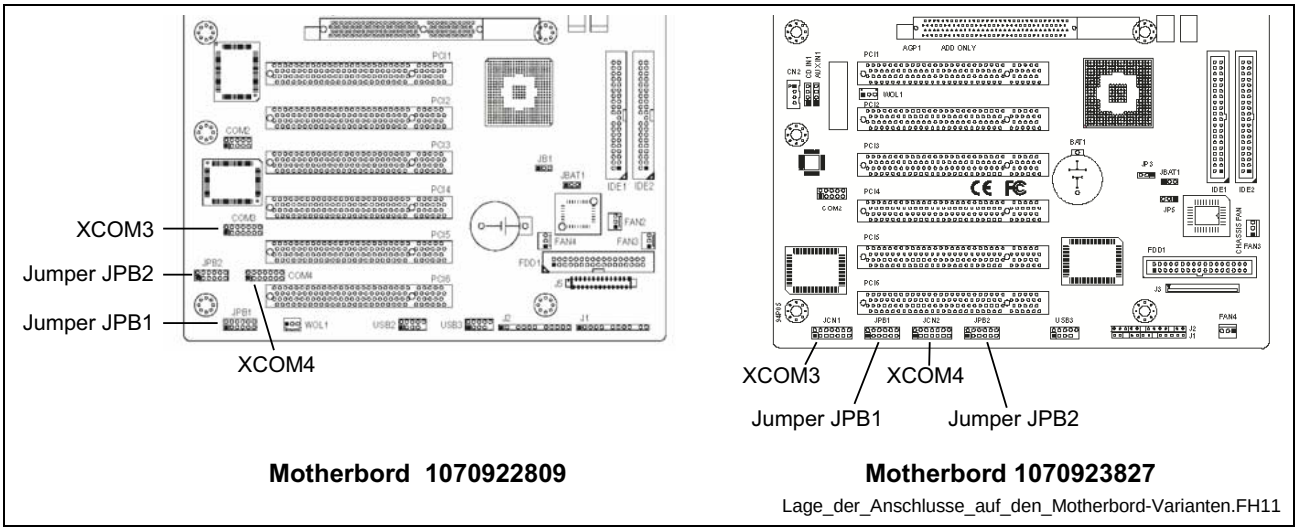


Fig. 7-31: Position of the connections and the jumper on the motherboard variants

XCOM3	Motherboard 1070922809 = Jumper JPB2 Motherboard 1070923827 = Jumper JPB1					
	1-2	3-4	5-6	7-8	9-10	11-12
RS232	OFF	OFF	OFF	OFF	OFF	ON

XCOM4	Motherboard 1070922809 = Jumper JPB1 Motherboard 1070923827 = Jumper JPB2					
	1-2	3-4	5-6	7-8	9-10	11-12
RS422	OFF ON (Term.)	OFF ON (Term.)	OFF	ON	ON	OFF

Jumper 1-2 ON = Termination 120 ohm between RXD+ and RXD-
Jumper 2-3 ON = Termination 120 ohm between TXD+ and TXD-

Fig. 7-32: Jumper positions for termination settings

8 Maintenance and Installation

8.1 General Information

VSB-type industrial PCs are maintenance-free. However, some components are subject to wear and must be replaced (see chapter "Wear parts" on page 4-4).

Maintenance

Include the following measures in the maintenance schedule:

- 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 fan at least once a year.

DANGER

Risk of injury through rotating fan impeller!

⇒ Do not touch the fan impeller with your hands or other objects.

- Ensure that the VSB 40.1 is connected to a working uninterruptible power supply unit.

Note: The accessories of Bosch Rexroth include uninterruptibe power supplies for the 230 V supply as well as for the 24 V supply (see chapter "Connection of the Uninterruptibe Power Supply" from page 8-2 onwards).

8.2 CMOS Battery

The battery, with which RAM, BIOS and clock are buffered, has a limited service life (see chapter "Wear parts" on page 4-4).

This lithium battery may not be changed by the user. The battery may only be exchanged by the Bosch Rexroth Service (see chapter 14v "Service und Support") or by personnel especially trained and authorized by the Service.

WARNING

Batteries might cause fire, explosions or chemical burn!

⇒ Do not load, remove, destroy, burn or heat batteries over 100 C.

⇒ Dispose old batteries immediately and properly.

⇒ Keep away from children.

8.3 Connection of the Uninterruptibe Power Supply

The accessories of Bosch Rexroth include uninterruptible power supplies (UPS) for the 230 V supply as well as for the 24 V supply (see section "Accessories" on page 11-2).

These USP devices bridge short voltage dips. Longer voltage dips cause and allow a normal shutdown of the operating system. Therefore, Bosch Rexroth recommends to use an UPS.

The uninterruptible power system is connected to the voltage supply line. According to the design, the USP communicates via the XUSB interface or the XCOM interface with the VSB 40.

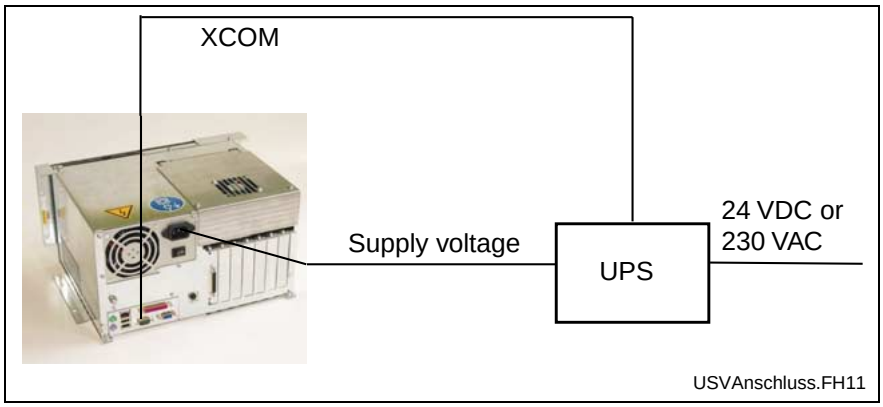


Fig. 8-1: Connection of the UPS

Mounting the UPS

The UPS for 24 V can directly be engaged on the top-hat rail (refer to the project planning manual of the UPS used). To mount the UPS for 230 V, a holder is available as accessories. This holder can be engaged in a top-hat rail or can be fastened to a rear panel with two M6 screws.

After mounting the holder, lift the angle bracket and insert the UPS. Now, close the angle bracket and fix it with the enclosed nut.

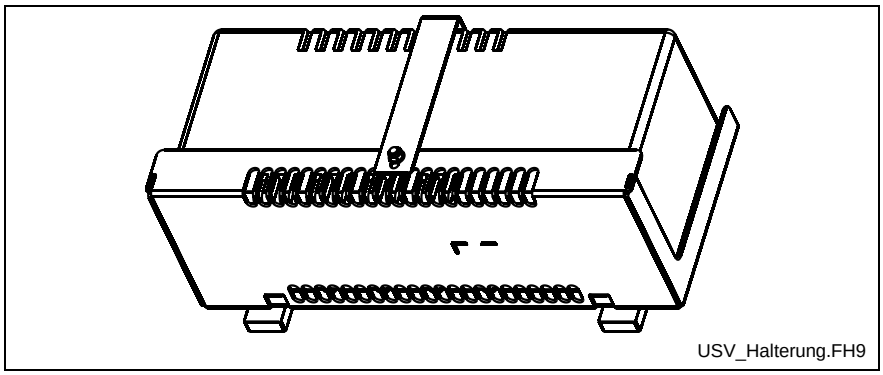


Fig. 8-2: View of the UPS inserted in the holder

Dimensions of the UPS

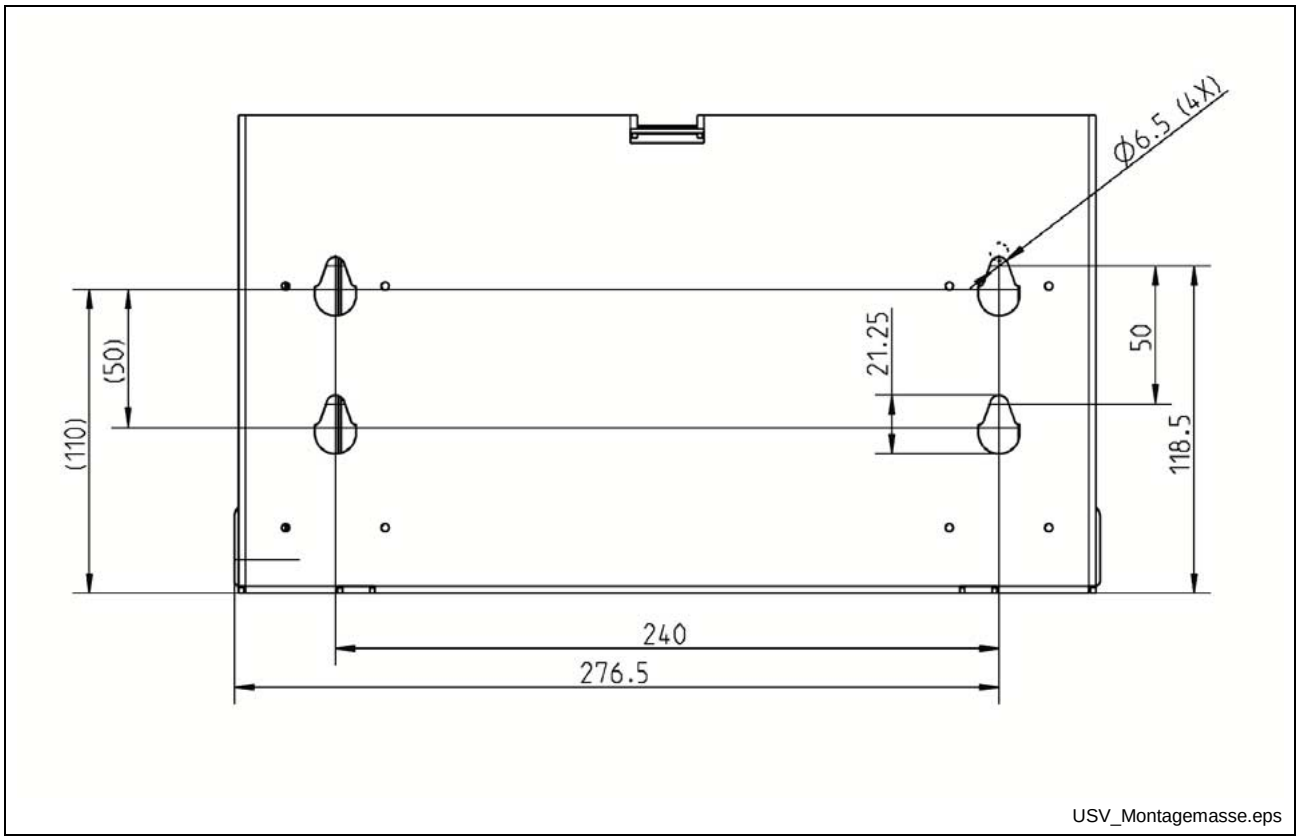


Fig. 8-3: Installation dimensions UPS holder

The depth of the UPS holder without mounting rail adapter is 117.5 mm and with mounting rail adapter 127 mm.

8.4 Hard disk

The installation frame of the hard disk can be accessed from the rear side of the VSB 40.1 or for variant LS from the bottom side of VSB 40.1.

CAUTION!

Loss of data!

⇒ Backup all required application data as well as operating system settings to an external storage medium!

CAUTION!

Risk to damage the VSB 40.1 by electrostatic discharges!

⇒ Comply with all ESD-protection measures during working with modules and components! Avoid electrostatic discharges!

Note: To store user data and to avoid the reinstallation of the operating system and application programs after a hard disk exchange, you should backup the well-working hard disk at regular intervals.

Note: The hard disk to be inserted must already have an installed operating system, if no external boot medium is connected to the industrial PC. In any case, it is recommended to have a completely installed operating system on the hard disk, to shorten the installation time!

The change of the hard disk for the two variants is not identic, as the hard disk is located at different positions.

Changing the Hard Disk of the VSB 40.1, Variant NN

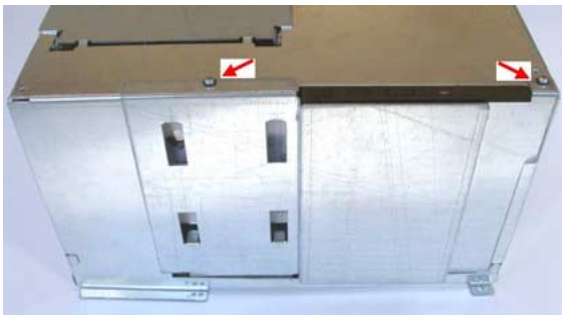
1. Save all required user data as well as the operating system settings of your system on an external storage medium or via the network connection!
2. Shutdown the operating system.
3. Wait until the power supply unit switches off and then, switch off the supply voltage. If required, unplug all connectors.
4. Put the VSB 40.1 on a solid mat, so that the connector panel looks in your direction.
5. Loosen the four screws with which the hard disk frame is fixed at the VSB 40.1:

83_Gehäuse.JPG

Fig. 8-4: Loosen the fastening screws at the mounting frame

6. Remove the VSB 40.1 from the mounting plate (mounting frame), so that it is turned away from you.

7. Loosen the fastening screws of the hard disk frame. The hard disk and (depending on the device design) the CD DVD drive are mounted on this plate:



83_Laufwerk2.JPG

Fig. 8-5: Fastening screws of the hard disk frame

8. Lift the hard disk frame:

83_offen.JPG

Fig. 8-6: Lifted hard disk frame

9. Loosen the two cables (IDE and power supply) from the hard disk.
10. Now, remove the old and insert the new hard disk.
11. Connect the two cables. Observe that you don't bend the connection pins.

Note: Check the cable connections leading to the hard disk for tightness.

12. After having re-connected the cables, put the hard disk frame into the housing by using the claws provided at its bottom. While closing the housing, observe not to squeeze any cables.
13. Fasten the hard disk frame with the two screws.
14. Put the VSB 40.1 in the mounting plate (mounting frame) and fix it with the four screws.
15. The new hard disk parameters are automatically recognized by the system. If the operating system does not boot automatically after switching on the VPB, interrupt the power supply for at least 10 seconds and restart.

16. After a regular booting of the PC, the user data as well as the operating system settings for the normal operating mode are to be restored.

Changing the Hard Disk of the VSB 40.1, Variant LS

1. Save all required user data as well as the operating system settings of your system on an external storage medium or via the network connection!
2. Shutdown the operating system.
3. Wait until the power supply unit switches off and then, switch off the supply voltage. If required, unplug all connectors.
4. Put the VSB 40.1 on a solid mat, so that the connector panel looks in your direction.
5. Loosen the four screws with which the hard disk frame is fixed at the VSB 40.1:

83_LS_Gehäuse.JPG

Fig. 8-7: Loosen the fastening screws at the mounting frame

6. Remove the VSB 40.1 carefully from the mounting plate (mounting frame), because the hard disk drive is fastened in the mounting frame.

83_LS_oeffnen.JPG

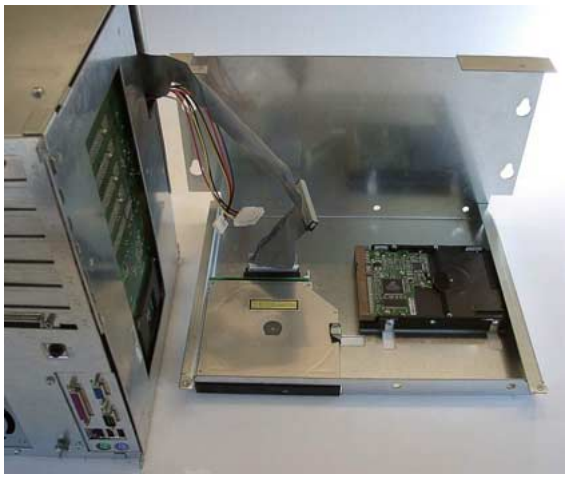
Fig. 8-8: Loosen the VSB 40.1 from the mounting plate

7. Tip the VSB 40.1 to the left side.

83_LS_gekippt.JPG

Fig. 8-9: Tip the VSB 40.1 to the left and remove it from the mounting plate

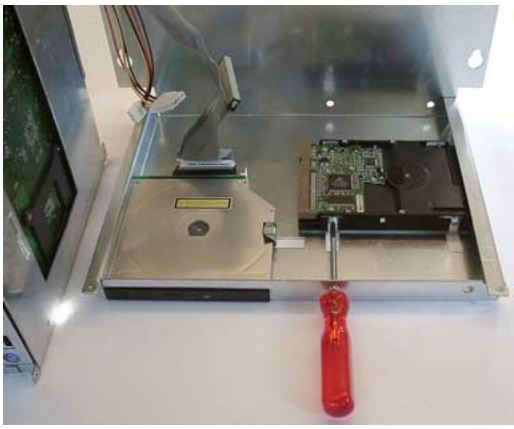
8. Now, you can loosen the cables (IDE and power supply) from the hard disk and put the VSB 40.1 on its left side. If necessary, you must loosen the cables from the CD-DVD drive to be able to position the VSB 40.1.



83_LS_offen2.JPG

Fig. 8-10: Loosen the cable from the hard disk

9. Loosen the screws, with which the hard disk is mounted, with a Philips screwdriver by inserting it through the holes in the mounting frame.



83_LS_Schrauber.JPG

Fig. 8-11: Loosen the fastening screws of the hard disk

10. Remove the old and insert the new hard disk.
11. Plug-in the cables at the hard disk and, if necessary, at the CD/DVD drive. Observe that you don't bend the connection pins.

Note: Check the cable connections leading to the hard disk for tightness.

12. After having plugged-in the cables, put the VSB 40.1 in the mounting plate (mounting frame). Observe not to squeeze any cables.
13. Connect the mounting plate (mounting frame) and VSB 40.1 with the four screws.
14. The new hard disk parameters are automatically recognized by the system. If the operating system does not boot automatically after switching on the VPB, interrupt the power supply for at least 10 seconds and restart.
15. After a regular booting of the PC, the user data as well as the operating system settings for the normal operating mode are to be restored.

Exchanging Hard Disk with Damper

In case of VSB devices containing hard disks with damper, the hard disk is located below the device, refer to Fig. 8-12.

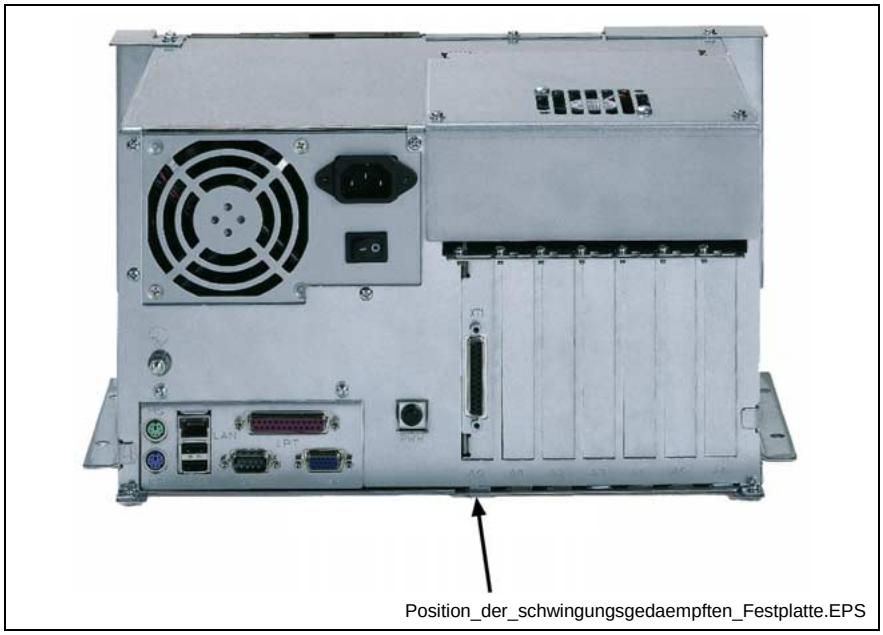


Fig. 8-12: Location of the hard disk with damper

In order to exchange the hard disk, remove the fastening screw of the hard disk installation frame on the bottom side of the VSB 40.1 (refer to Fig. 8-13). Lift the hard disk frame and after releasing the retaining spring unplug the ribbon cable, with which the hard disk is connected to the main board. Now, the installation frame with hard disk can be removed and can be exchanged as whole unit.

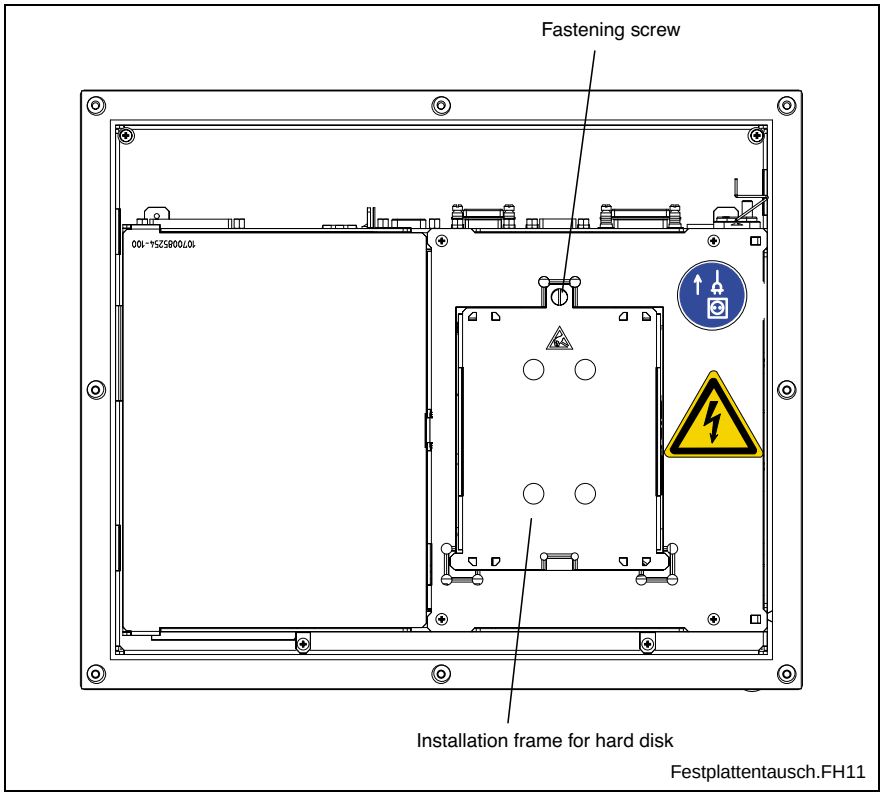


Fig. 8-13: Position of the hard disk's installation frame and the fastening screw

8.5 Extension Cards

To plug extension cards slots for the PCI bus are available.

CAUTION!

Risk of damage to the operator terminal or the extension cards by electrostatic discharges!

⇒ Comply with all ESD-protection measures during working with modules and components! Avoid electrostatic discharges!

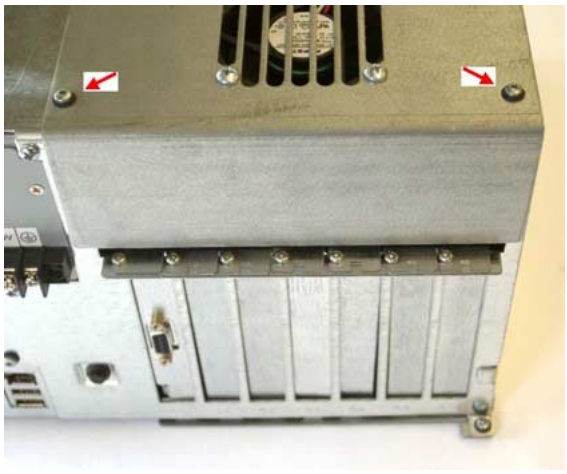
CAUTION!

Risk of damage to the operator terminal or corruption of application software by integrating non-released extension cards!

⇒ Install only released extension cards, and have them installed by skilled employees.

Insert an Extension Card

1. Shutdown the operating system.
2. Wait until the power supply unit switches off automatically and then, switch off the supply voltage. If required, unplug all connectors from the VSB 40.1.
3. Put the VSB 40.1 on a solid mat, so that the connector panel looks in your direction.
4. Loosen and remove the two fastening screws of the cover:



84_Deckel.JPG

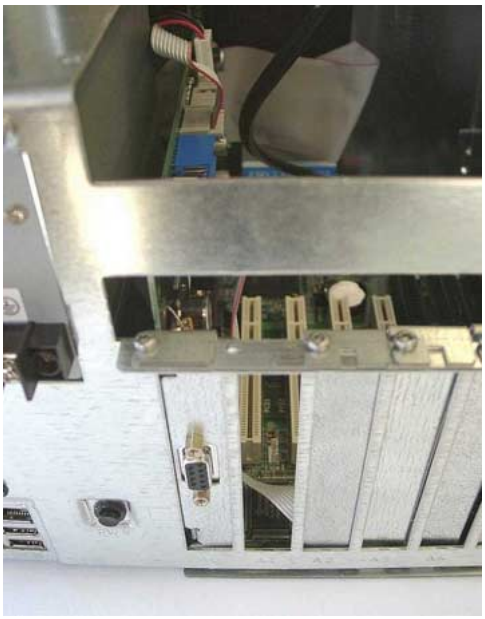
Fig. 8-14: Loosen the fastening screws of the cover

5. Lift up the cover with the fan.

84_Deckeloffen.JPG

Fig. 8-15: Lift the cover with fan

6. Loosen the fastening screw of the corresponding extension card and remove it:

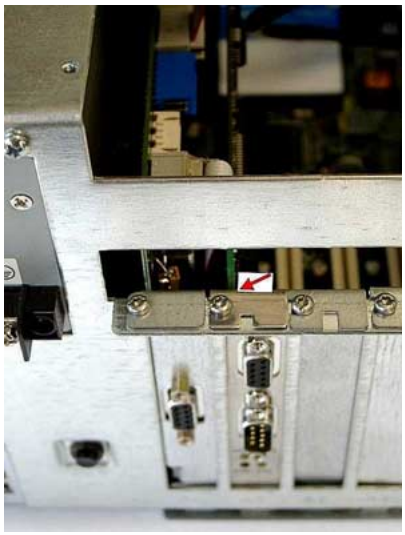


84_Slotblech2.JPG

Fig. 8-16: Remove extension card

7. Insert the plug-in assembly from the top. Don't use force. The connections are to be inserted in the plug on the main board.

8. Fasten the plug-in assembly with the screw, with which the extension card was fixed.



84_neueKarte2.JPG

Fig. 8-17: Fix the new PCI card with the screw

9. Close the top cover and fasten it with the two screws.

If the card is equipped with a Plug and Play (PnP) function, it is automatically recognized by the operating system and integrated in the system, provided that no hardware conflicts (IRQ etc.) with other extension cards or connected devices occur.

In the event that after a system reboot the functions based on the new card are not available, there may be several reasons:

- The card is not properly seated in the PCI slot.
- The driver software of the card has not been installed or its installation is faulty.
- IRQ (Interrupt) conflict with other PC hardware components.
- The software of the card has not been installed.

CAUTION!

Risk of destruction of the main board or the extension cards because of address conflicts (IRQ, memory access, I/O address)!

⇒ Consider the specifications of the card manufacturer. It might be required to set new configurations in the BIOS and in the operating system (e.g. Windows XP Control Panel).

BIOS Settings

If the BIOS settings have to be changed, you will find the required information in the manual about the used motherboard delivered with the VSB 40.1 and, if necessary, in the documents about the PCI card mounted by yourself.

9 Software

9.1 UPS Software

The software required for the optionally available UPS (see chapter 8.3 "Connection of the Uninterruptible Power Supply" on page 8-2 and section chapter "Uninterruptible Power Supply" on page 11-2) is stored on the hard disk of the VSB 40.1. Before being able to use this software, you have to install it. Install this software using the installation softaware BRCVInstall saved on the desktop.

9.2 Touch Screen Software

For certain VDP-type displays a touch screen is integrated, that allows the operation via the touch-sensitive surface of the display.

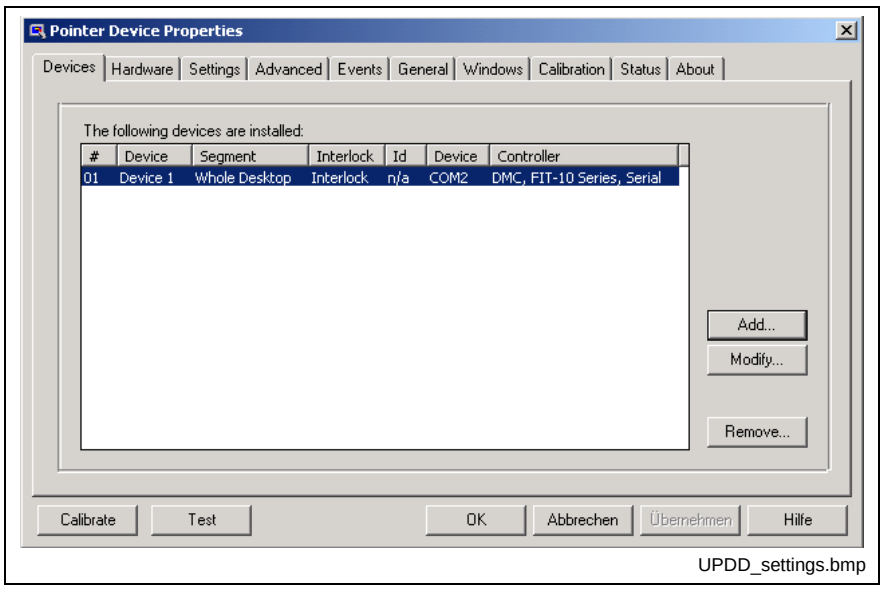
The device-internal serial interface COM2 is used for the communication between the touch screen controller and the PC.

You have to install the required driver software by means of the installation software BRCVInstall archived on the desktop.

After the installation settings and changes in the application "Pointer Devices" in the Windows Control Panel are possible. You can reach this setup program via "Start -> Programs -> UPDD -> Settings.

Fig. 9-1: UPDD setup programs for the touch screen

The following dialog window appears for the different settings:



UPDD_settings.bmp

Fig. 9-2: Dialog window to set the touch screen

For more detailled information, please select the **Help** button on the respective tab.

Via "Start -> Programs -> UPDD" you reach further useful programs, if required.

The program “Calibrate” might be of special interest. If required, you can calibrate the touch mouse with the help of this program. For this, touch, one after the other, the middle of the four crosses displayed on the screen.

For further information on this programs refer to the online help, which you can start directly as file GENER-EN.CHM in folder C:\ProgramFiles\UPDD\.

10 Disposal and Environmental Protection

10.1 Disposal

Products

Our products can be returned to us free of charge for disposal. However, it is a precondition that the products are free of oil, grease or other dirt.

Furthermore, the products returned for disposal must not contain any undue foreign matter or foreign component.

Please send the products free domicile to the following address:

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

Packaging Materials

The packaging materials consist of cardboard, wood and polystyrene. These materials can be easily recycled. For ecological reasons, please refrain from returning the empty packages to us.

10.2 Environmental Protection

No Release of Hazardous Substances

Our products do not contain any hazardous substances, which may be released in the case of appropriate use. Accordingly, our products will normally not have any negative effect on the environment.

Materials Contained in the Products

Electronic Devices

Electronic devices mainly contain:

- steel
- aluminum
- copper
- synthetic materials
- electronic components and modules

Motors

Motors mainly contain:

- steel
- aluminum
- copper
- brass
- magnetic materials
- electronic components and modules

Recycling

Due to their high content of metal most of the product components can be recycled. In order to recycle the metal in the best possible way, the products must be disassembled into individual modules.

Metals contained in electric and electronic modules can also be recycled by means of special separation processes. The synthetic materials remaining after these processes can be thermally recycled.

If the products contain batteries or rechargeable batteries, these batteries are to be removed and disposed before they are recycled.

11 Ordering Information

11.1 Type Code Designation VSB40.1

According to the following type code designation, the IPC VSB 40.1 is available in different variants.

Abbrev. column →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Example:	V	S	B	4	0	.	1	G	4	E	-	5	1	2	N	N	-	C	1	C	-	A	D	-	N	N	-	F	W					

Product
VSB . . . . . = VSB

Line
40 . . . . . = 40

Design
1 . . . . . = 1

Control panel interface
GIGASTAR . . . . . = G4

PC box
6 slots, PCI . . . . . = E

Memory capacity (RAM)
512 MB . . . . . = 512
1024 MB . . . . . = 1G0

Interface
Without special interface . . . . . = NN

System configuration
Celeron, min. 2GHz . . . . . = C1

Connecting voltage
AC 115 to 230 V, 50 to 60 Hz . . . . . = C
DC 24 V . . . . . = D

Hard disc (HD)
3.5", mind. 20 GB . . . . . = A
2.5", mind. 20 GB, with vibration-resistant suspension . . . . . = B
2.5", mind. 8 GB, Solid State Disk (SSD) . . . . . = C

Disc drive
Without . . . . . = N
DVD-ROM. . . . . = D
DVD±RW . . . . . = E

Other design
Without . . . . . = NN
Disc drive in connector direction . . . . . = LS

Firmware and software
Denotes that firmware and software must be ordered as separate subposition = FW

Typenschuessel_VSB.FH11

Fig. 11-1: Type code designation VSB 40.1

11.2 Accessories

Network Connection

Ordering designation	Part number	Description
B-AC STECKER NETZ 230V	1070 912881	Mains connector 230 V, male inlet connector for non-heating apparatus, angular, for self-mounting
BKS-U-N-NTZKAB-IPCRHO-002,5-P	1070 048937	Mains cable 230 V with female inlet connector for non-heating apparatus, angular, cable length 2.5 m

Fig. 11-2: Connectors and cables for VSB 40.1

Connecting Cables to the VDP 16 and VDP 40 (G4 Display Interface)

Ordering designation	Part number	Description
BKS-U-H-G4****-IPCVDP-001,0-P	R911307684	Connecting cable flexible, 1 m
BKS-U-H-G4****-IPCVDP-002,0-P	R911170723	Connecting cable flexible, 2 m
BKS-U-H-G4****-IPCVDP-005,0-P	R911306043	Connecting cable flexible, 5 m
BKS-U-H-G4****-IPCVDP-010,0-P	R911306046	Connecting cable flexible, 10 m
BKS-U-H-G4****-IPCVDP-015,0-P	R911308482	Connecting cable flexible, 15 m
BKS-U-H-G4****-IPCVDP-020,0-P	R911306047	Connecting cable flexible, 20 m
BKS-U-H-G4A***-IPCVDP-025,0-P	R911170286	Connecting cable flexible, 25 m
BKS-U-H-G4A***-IPCVDP-030,0-P	R911170287	Connecting cable flexible, 30 m
BKS-U-H-G4A***-IPCVDP-035,0-P	R911170288	Connecting cable flexible, 35 m
BKS-U-N-G4A***-IPCVDP-035,0-P	R911170777	Connecting cable flexible, 35 m
BKS-U-N-G4A***-IPCVDP-040,0-P	R911170289	Connecting cable flexible, 40 m
BKS-U-N-G4A***-IPCVDP-045,0-P	R911170290	Connecting cable flexible, 45 m
BKS-U-N-G4A***-IPCVDP-050,0-P	R911170291	Connecting cable flexible, 50 m
BKS-U-N-G4A***-IPCVDP-055,0-P	R911170292	Connecting cable flexible, 55 m

Fig. 11-3: Connecting cables to the VDP 16.1, VDP 40.1 and VDP 60.1

Uninterruptible Power Supply

Ordering designation	Part number	Description
VAU01.1S-024-024-240-NN	R911307090	UPS 24 VDC, 240 W
VAU01.1S-230-230-300-NN	R911170724	USV 230 VAC, 300 W
SUP-M02-VAU01.1S-230	R911170725	Holder for top-hat rail mounting of the USP 230 VAC
SUP-M03-VAU01.1S-230	R911170819	Holder for screw mounting of the USP 230 VAC

Fig. 11-4: Uninterruptible power supply

12 List of Figures

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14 Service and Support

14.1 Helpdesk

Our service helpdesk at our headquarters in Lohr, Germany, will assist you with all kinds of inquiries.

Contact us:

- By phone through the Service Call Entry Center
  Monday to Friday: 7:00 am – 6:00 pm CET
  +49 (0) 9352 40 50 60
- By fax
  +49 (0) 9352 40 49 41
- By E-mail: service.svc@boschrexroth.de

14.2 Service Hotline

Out of helpdesk ours please contact our German service department directly:

+49 (0) 171 333 88 26

or

+49 (0) 172 660 04 06

Hotline numbers for other countries can be found in the addresses of each region on the Internet (see below).

14.3 Internet

Additional notes regarding service, maintenance and training, as well as the current addresses of our sales and service offices can be found on

http://www.boschrexroth.com/

Outside Germany please contact our sales/service office in your area first.

14.4 Helpful Information

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

- detailed description of the fault and the circumstances
- Information on the name plate of the affected products, especially type codes and serial numbers
- Your phone and fax numbers and E-mail address, so we can contact you in case of questions

Rexroth
Bosch Group

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