Rexroth
Bosch Group

Rexroth BTA20.3

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Purpose of Documentation This documentation serves

- to describe the hardware functions of the BTA20.3,
- to specify the technical data of the BTA20.3,
- to describe the connection and installation of the BTA20.3.

Record of Revisions

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Contents

1 System Presentation

1.1 Brief Description

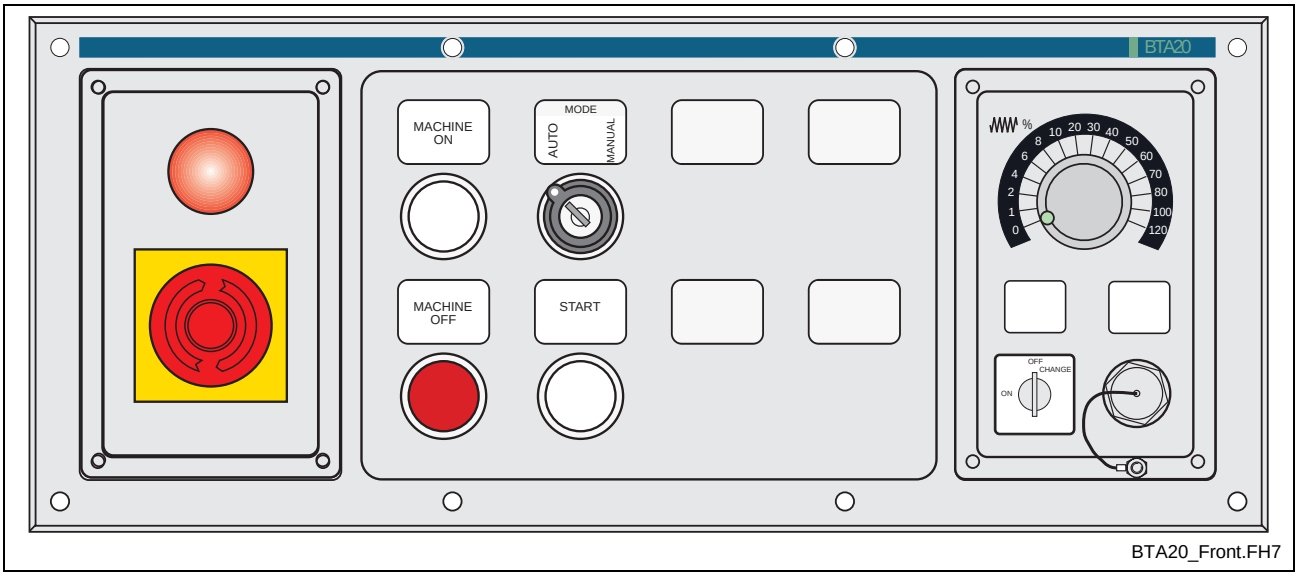


Fig. 1-1: BTA20.3 – Front view

The BTA20.3 was specially designed for use in conjunction with the BTV20.3. Thus, the user is provided with a suitable freely configurable operator panel. The panel consists of three units and can be ordered according to the project requirements.

1.2 Special Features of the BTA20.3

Minimum Wiring Combined with High Flexibilty

As the slots for the 22,5 mm standard built-in components of series ZB2 of Telemecanique can be equipped as required, wiring is reduced to a minimum. Subsequently mounted switching elements are directly connected to the INTERBUS. If required, the right auxilary contact can be potential-free wired by jumpers (see Fig. 4-4).

30-pin Terminal Strip

All contacts for the hard-wired connections are on the 10-pin terminal strip (X1-X3). These are:

- Emergency stop,
- enabeling circuits and
- an isolated contact of each standard built-in element that can be connected from the bus to this terminal strip via jumper.

Freely Configurable Modules

Two emergency stop and three enabeling circuits (for mobile operator terminals) are available on both module slots. Each module can be mounted on the left or right side.

Integrated INTERBUS Connection

The built-in INTERBUS adapter contains the entire, active electronics on a single printed circuit board. The BTA20.3 uses an I/O width of three words. Eight isolated 24 V inputs and outputs are available for external connections (e.g. for signal lamps etc.).

Isolated Interface Converter

The integrated interface converter connects the serial RS232 interface of a control with the RS422 interface of the compact operator terminal BTV05.2 or the mobile operator terminal BTC06.2 without the need to equip this control with an additional interface board.

1.3 Product-Specific Safety Instructions

The information given in this documentation with regard to the use of the delivered components contains only examples of applications and suggestions.

The machine and installation manufacturer must ensure, that

- the delivered components are suited for this individual application and check the information given in this documentation with regard to the used components,
- 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 (according to machine regulation 98/37/EG, appendix II B).

2 Important Directions for Use

2.1 Appropriate Use

Introduction

Products of Bosch Rexroth 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 products of Bosch Rexroth, 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 of Use and Application

The BTA20.3 is a freely configurable operator panel, which can be ordered in product-specific design. The operator panel BTA20.3 produced by Bosch Rexroth is designed for use in the following cases:

- to operate control units at a machine,
- in certain designs, to provide the connections for a mobile operator terminal BTV06.2.

Note: The BTA20.3 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.

For an application-specific use of the operator panel unit types with differing equipment are available.

Typical areas of application of a BTA20.3 are:

- lathes
- milling machines and
- machining centers

The BTA20.3 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 operator panels 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 operator panels 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 Module Layout, Address Assignment

4.1 Basic Module

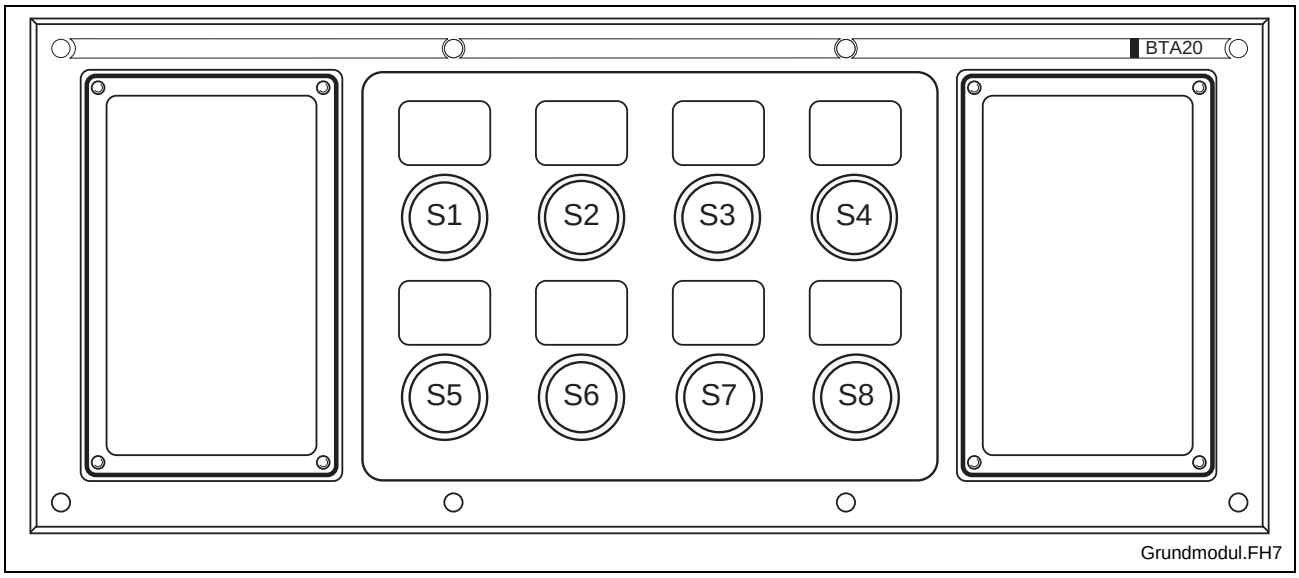


Fig. 4-1: BTA20.3 – Basic module

The basic module of the BTA20.3 permits to insert a maximum of eight standard switching elements of the Telemecanique ZB2 program depending on the special user requirements. Each element features a maximum of two contacts and an indicator lamp. All cutouts in the front panel are pre-milled to 0,5 mm. The next section explains how to create a cutout. The keys are labeled by means of insert strips.

Instruction for Installing Additional Switches

ESD – electrostatic sensitive components!

⇒ Whenever you work with the open unit, your working position and the employed tools must comply with the ESD protective measures.

To insert additional switching elements in the front of the BTA20.3, proceed as follows:

1. Unscrew the electronics enclosure from the unit.
2. Dismantle the electronics unit.
   a) Use a 5,5 mm socket wrench to loosen the six spacing bolts marked by arrows and the letters A or B (see Fig. 4-2).
   b) Remove the electronics block LK-BIB and the main board.

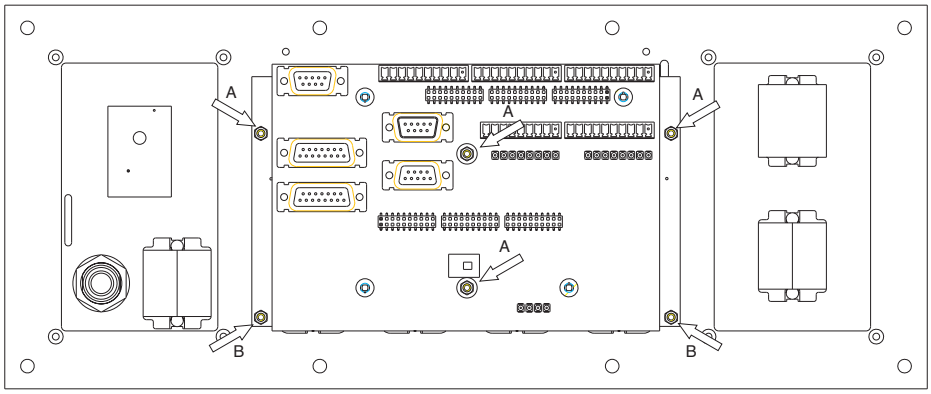


Fig. 4-2: Position of the spacing bolts

Note: It is very important to remove the electronics part, as chips causing malfunctions may be produced while cutting out the front panel.

3. Use a knife (scalpel) to cut the front film along the pre-milled cutout contour (see Fig. 4-3).

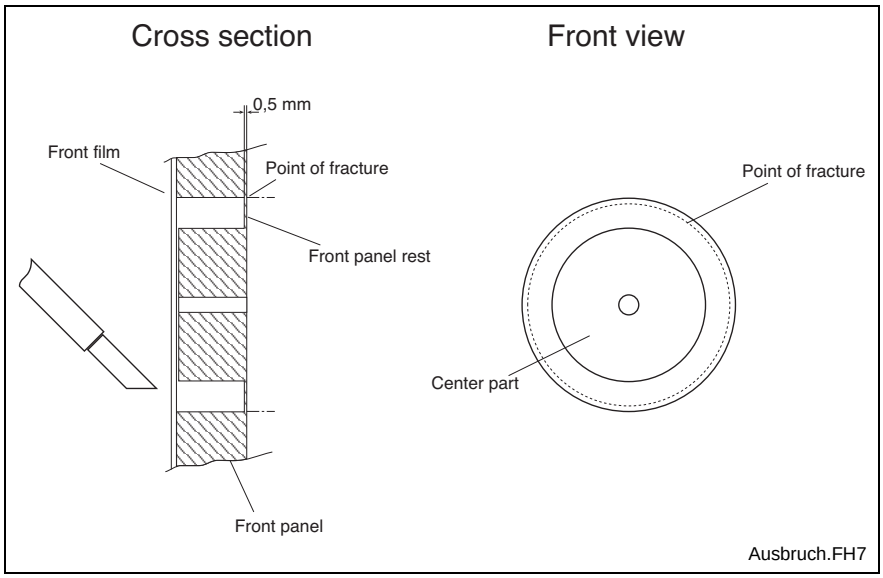


Fig. 4-3: Front panel cross section

4. Use a knife and slightly scratch along the front panel contour pre-milled to 0,5 mm.
5. Break out the center part.
6. Remove the resulting burr and the chips from the front panel.
7. Insert the required front panel element (pushbutton, lamp, key switch, etc.) and screw it tight.
8. Plug the required switching elements (NC/NO contacts) onto the main board and preselect the jumper positions of the right switching element for internal or external operation.
9. Position the board block onto the switching elements.
10. Tighten the spacing bolts.
11. Position the electronics enclosure and tighten the retaining screws.

Main Board Configuration

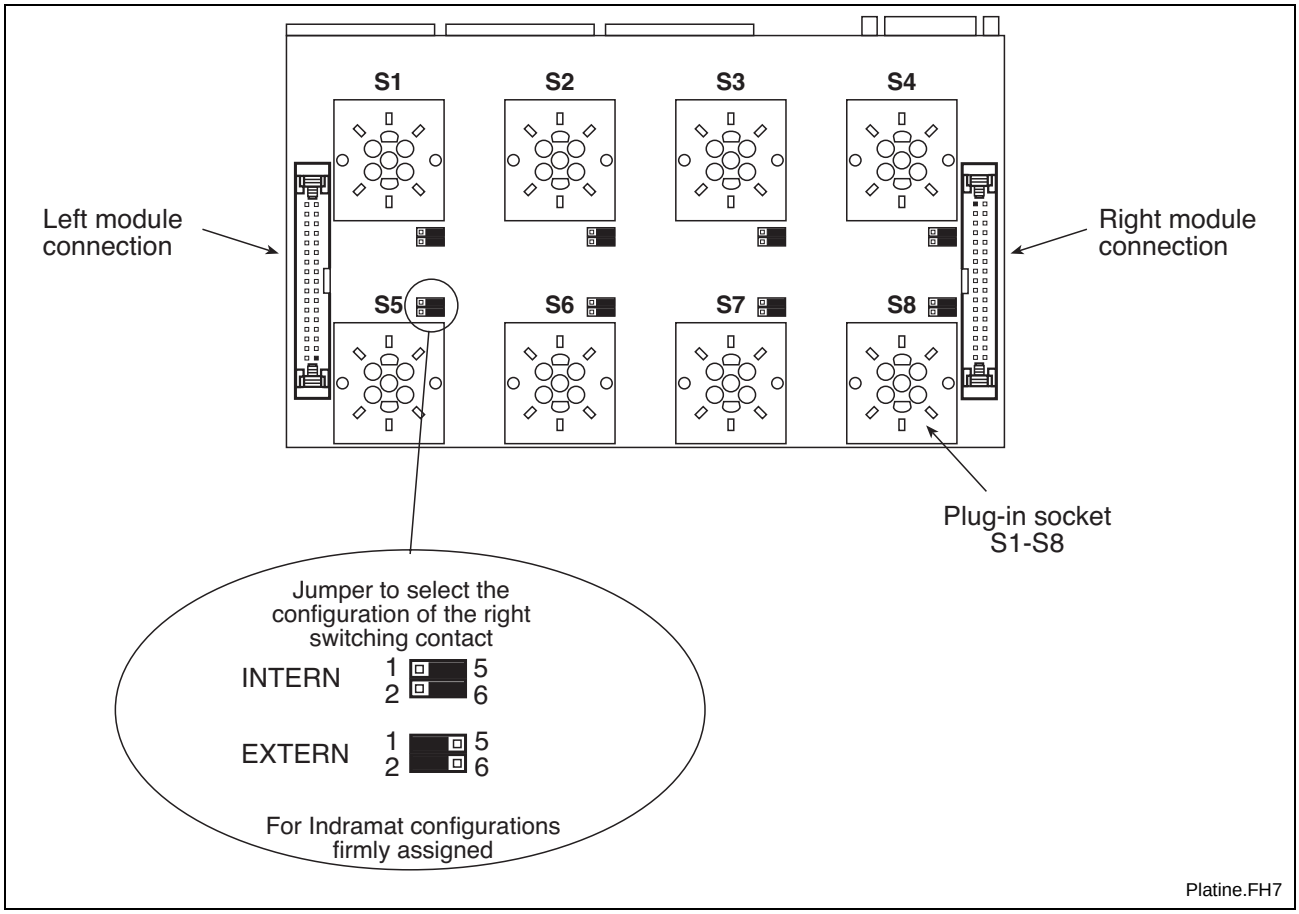


Fig. 4-4: Main board

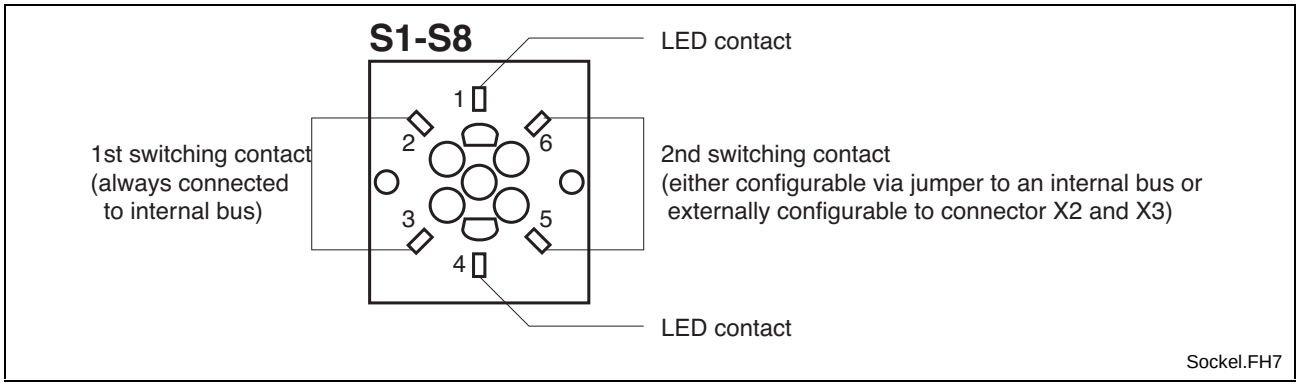


Fig. 4-5: Plug-in socket

The main board is equipped with eight plug-in sockets (see Fig. 4-5). Such a socket has two slots for switching contacts (NC/NO contact) or a LED contact. The first contact is used for internal bus operation. To support external wiring, jumpers permit the right auxilary contact of each switch to be set to either bus interface (internal) or to terminal strip X2 and X3 (external).

Address Assignment

Outputs

Position	Address
LED S1	O *.0.0
LED S2	O *.0.1
LED S3	O *.0.2
LED S4	O *.0.3
LED S5	O *.0.4
LED S6	O *.0.5
LED S7	O *.0.6
LED S8	O *.0.7

Fig. 4-6: LED addresses within the basic module

Inputs

Switching element / position	Address
S 1 – left auxilary contact	I *.6.0
S 1 – right auxilary contact	I *.6.1
S 2 – left auxilary contact	I *.6.2
S 2 – right auxilary contact	I *.6.3
S 3 – left auxilary contact	I *.6.4
S 3 – right auxilary contact	I *.6.5
S 4 – left auxilary contact	I *.6.6
S 4 – right auxilary contact	I *.6.7
S 5 – left auxilary contact	I *.7.0
S 5 – right auxilary contact	I *.7.1
S 6 – left auxilary contact	I *.7.2
S 6 – right auxilary contact	I *.7.3
S 7 – left auxilary contact	I *.7.4
S 7 – right auxilary contact	I *.7.5
S 8 – left auxilary contact	I *.7.6
S 8 – right auxilary contact	I *.7.7

Fig. 4-7: Addresses of the switching elements within the basic module

Interface Converter

In the normal mode the BTA20.3 provides RS422 communication via the connectors X8A and X9. The interface converter permits to organize data exchange with the mobile operator terminal BTC06.2 or a PLC.

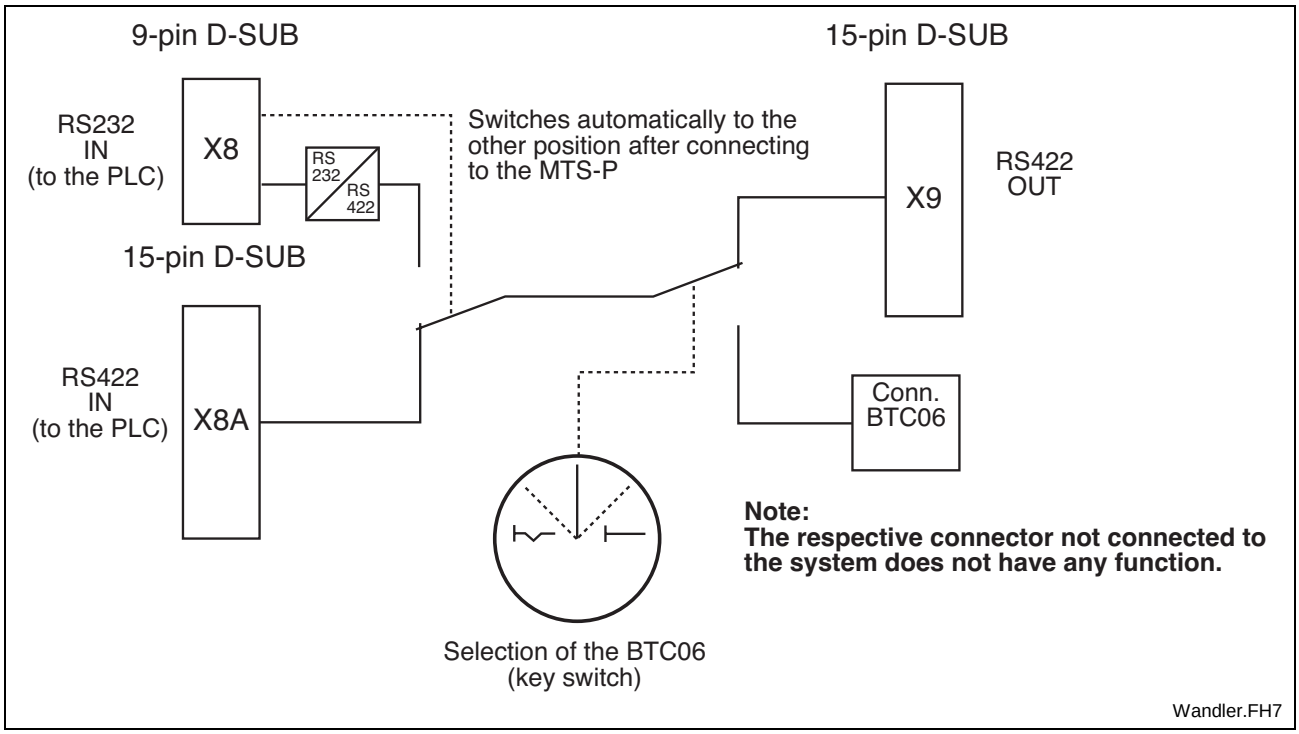


Fig. 4-8: Switching concept of the interface converter

As shown in the figure above, the converter has a switching function. In its neutral position, there's a connection between the RS422 IN and the RS422 OUT, i.e. data can be received and transmitted using the RS422 protocol. The converter becomes active, if RS232 communication has to be connected with RS422 communication. If, for example, a MTS-P module (PLC plug-in board in the BTV20.3) is connected to a BTA20.3, the converter switches automatically over to connection X8 (RS232 IN). Precondition for this is the correct initialization of the MTS-P. Devices connected to X9 may exchange data with the PLC.

Note: In this case, connector X8A (RS422 IN) has no function.

To operate a BTC06.2, the key switch of the ND/NE or VE module is necessary. If the key switch is in left-hand position, the mobile operator terminal is connected to the PLC.

Note: In this case, connector X9 has no function.

It is not possible to use a BTC06.2 and, at the same time, maintain the communication with other RS422 devices.

4.2 Emergency Stop Module, Type NA

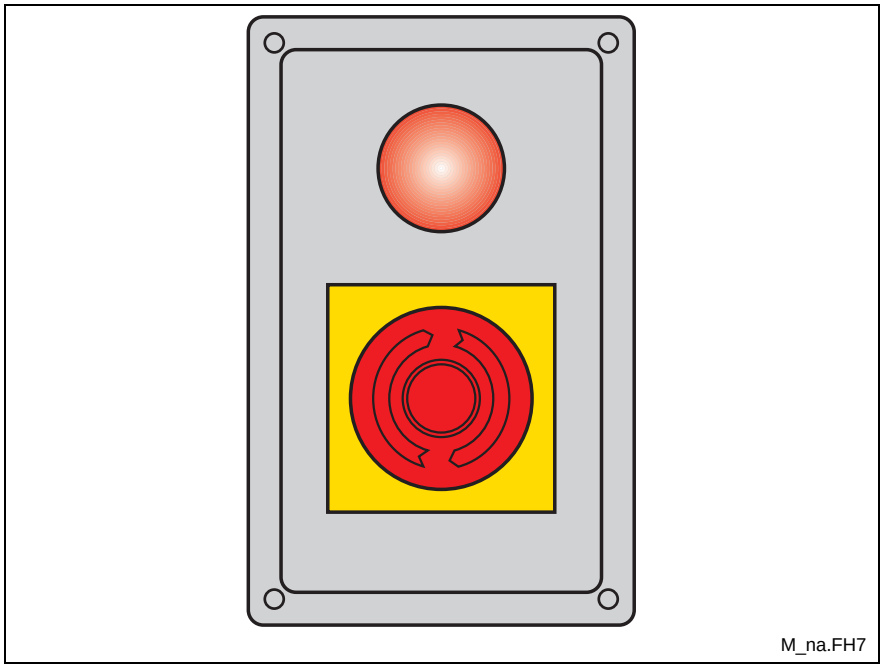


Fig. 4-9: Emergency stop module, type NA

The emergency stop module NA provides an emergency stop pushbutton and an indicator lamp that can be connected via INTERBUS.

From the emergency stop pushbutton a NC contact is looped into each of the two emergency stop circuits. Another NC contact, as well as the indicator lamp, is connected to the INTERBUS as auxilary contact.

Address Assignment when Installing on the Left Module Slot

Outputs

Position	Address
Indicator lamp	O *.1.0

Fig. 4-10: Address of the indicator lamp in the E-STOP module

Inputs

Switching element / position	Address
Auxilary contact: E-STOP	I *.8.0

Fig. 4-11: Address of the auxilary contact in the E-STOP module

Address Assignment when Installing on the Right Module Slot

Outputs

Position	Address
Indicator lamp	O *.1.4

Fig. 4-12: Address of the indicator lamp in the E-STOP module

Inputs

Switching element / position	Address
Auxilary contact: E-STOP	I *.9.0

Fig. 4-13: Address of the auxilary contact in the E-STOP module

4.3 Emergency Stop Module, Type NC

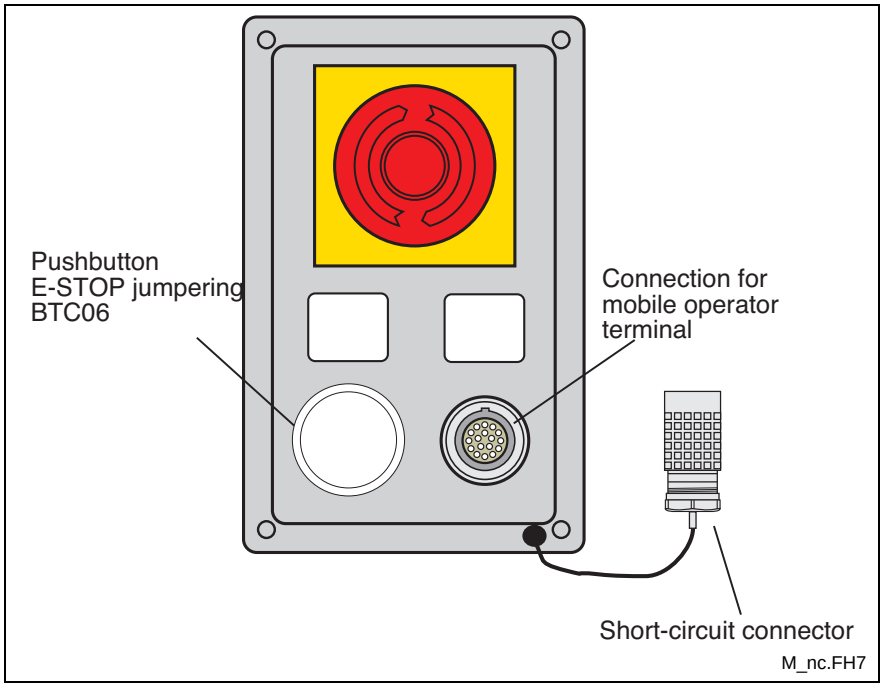


Fig. 4-14: Emergency stop module, type NC

The NC module has in addition to the emergency stop pushbutton a connection for a BTC06.2. The pushbutton serves to jumper the two emergency stop circuits at the BTA20.3 during the plug-in and plug-off time of the mobile operator terminal. The interface of the BTC06.2 is immediately active after plugging it in. Here, the switching activation of the interface block corresponding to the modules with key switch is not possible (compare chapter 4.4).

Note: The emergency stop jumper function does not provide forced-guided contacts and is not protected against non-authorized activation.

This module may only be used in conjunction with a mobile operator terminal in areas, in which, when the module is used in an appropriate manner, may result no material damage or bodily harm or this is ensured by additional measures.

Functional Restrictions

The pushbutton to jumper the emergency stop restricts the functionality of the BTA20.3.

- Only **one** BTA20.3 can be used. It is not possible to loop the RS422 interface signals to other BTAs.
- The third enabeling circuit is only looped in this module. Thus, it is not possible to switch the third enabeling circuit. Therefore, it can't be used.

Address Assignment when Installing on the Left Module Slot

Inputs

Switching element / position	Address
Auxilary contact: E-STOP	I *.8.0

Fig. 4-15: Address of the auxilary contact in the E-STOP module NC

Address Assignment when Installing on the Right Module Slot

Inputs

Switching element / position	Address
Auxilary contact: E-STOP	I *.9.0

Fig. 4-16: Address of the auxilary contact in the E-STOP module NC

4.4 Emergency Stop Module, Type ND/NE

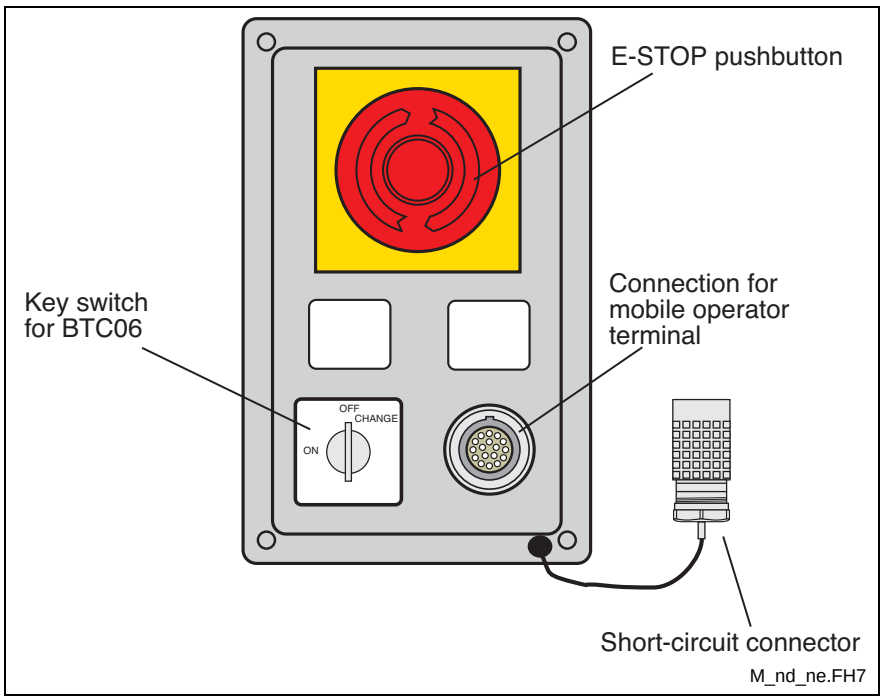


Fig. 4-17: Emergency stop module, type ND/NE

The module ND/NE has in addition to the emergency stop pushbutton a BTC06.2 connection as well as a key switch to connect a mobile operator terminal (explanation of the key switch position see Fig. 4-18) if required.

From the emergency stop pushbutton a NC contact is looped into each of the two emergency stop circuits. Another NC contact is connected to the INTERBUS as auxilary contact.

The connection for the mobile operator terminal is provided with two emergency stop circuits, which are jumpered via the short-circuit connector in the normal operating mode. To connect a mobile operator terminal, the emergency stop contacts of the female connector are jumpered during the plug-in process with the key switch located besides the female connector in position right (spring return). For this version, only two enabeling circuits are used, the third is guided via the key switch.

Switching Positions of the Key Switch

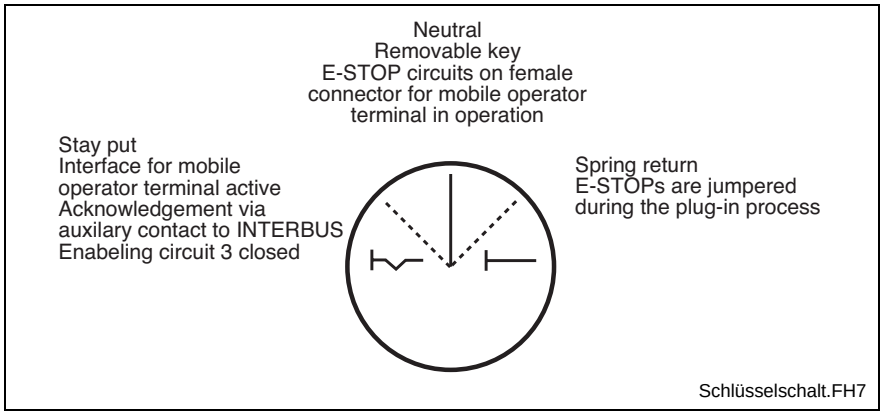


Fig. 4-18: Switching positions of the key switch

Switching Position in the Center:

- Function: Neutral
- Removable key, no contact closed, interface for BTC06.2 not activated and switched in loop through mode to the subsequently connected BTA.

Switching Position on the Right (Spring Return)

- Function: During plugging-in the mobile operator terminal BTC06.2 the two emergency stop circuits are jumpered.
- Non-removable key, contacts closed to jumper the two emergency stop circuits, interface for BTC06.2 not activated and switched in loop through mode to the subsequently connected BTA. In this position the short-circuit connector at the connection for the mobile operator terminal can be removed and replaced by the BTC06.2 connector without interrupting the two emergency stop circuits.

Switching Position on the Left (Stay Put):

- Function: Mobile operator terminal active
- Removable key, interface for the BTC06.2 activated, no loop through mode to the subsequently connected BTA, INTERBUS input "Auxilary contact for key switch" on log. 1, enabeling circuit 3 closed on BTA connector X1.

Address Assignment when Installing on the Left Module Slot

Inputs

Switching element / position	Address
Auxilary contact: E-STOP	I *.8.0
Acknowledgment contact for key switch	I *.8.4

Fig. 4-19: Address of the auxilary contact in the E-STOP module

Address Assignment when Installing on the Right Module Slot

Inputs

Switching element / position	Address
Auxilary contact: E-STOP	I *.9.0
Acknowledgment contact for key switch	I *.9.4

Fig. 4-20: Address of the auxilary contact in the E-STOP module

4.5 Feed / Spindle Module, Type VB

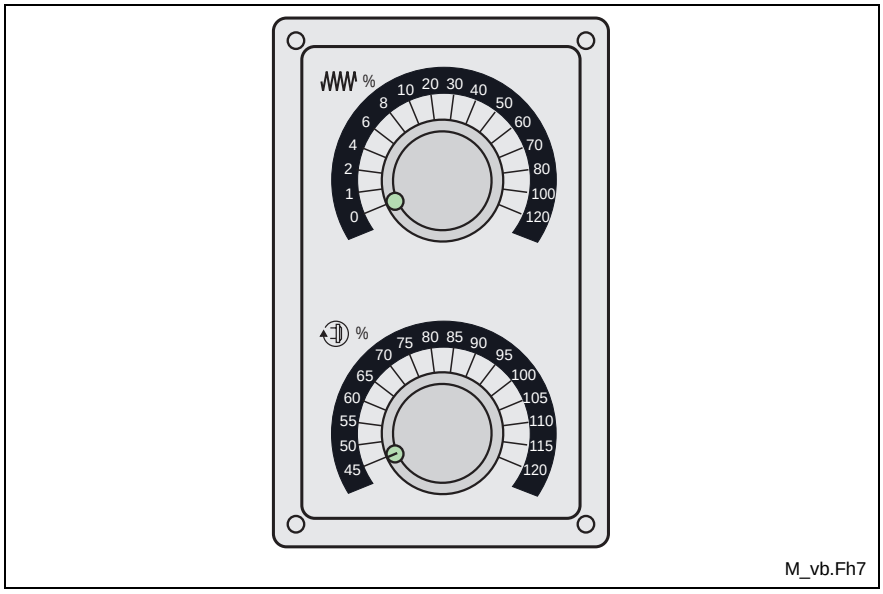


Fig. 4-21: Feed / spindle module, type VB

This module for special machines provides two Gray code override switches for feed and spindle.

Address Assignment when Installing on the Left Module Slot

Inputs

Switching element / position	Address
Feedrate override bit 0	I *.8.0
Feedrate override bit 1	I *.8.1
Feedrate override bit 2	I *.8.2
Feedrate override bit 3	I *.8.3
Override spindle bit 4	I *.8.4
Override spindle bit 5	I *.8.5
Override spindle bit 6	I *.8.6
Override spindle bit 7	I *.8.7

Fig. 4-22: Addresses of the override switches

Address Assignment when Installing on the Right Module Slot

Inputs

Switching element / position	Address
Feedrate override bit 0	I *.9.0
Feedrate override bit 1	I *.9.1
Feedrate override bit 2	I *.9.2
Feedrate override bit 3	I *.9.3
Override spindle bit 4	I *.9.4
Override spindle bit 5	I *.9.5
Override spindle bit 6	I *.9.6
Override spindle bit 7	I *.9.7

Fig. 4-23: Addresses of the override switches

Gray Code Table

The output signals of the two override switches are delivered by a 4 bit Gray code switch with the following assignment:

Scale value Feed (Bit 0-3)	Scale value Spindle (Bit 4-7)	Bit 0 / 4	Bit 1 / 5	Bit 2 / 6	Bit 3 / 7
0 %	45 %				
1 %	50 %	X			
2 %	55 %	X	X		
4 %	60 %		X		
6 %	65 %		X	X	
8 %	70 %	X	X	X	
10 %	75 %	X		X	
20 %	80 %			X	
30 %	85 %			X	X
40 %	90 %	X		X	X
50 %	95 %	X	X	X	X
60 %	100 %		X	X	X
70 %	105 %		X		X
80 %	110 %	X	X		X
100 %	115 %	X			X
120 %	120 %				X

Fig. 4-24: Gray code table of the VB module

4.6 Feed Module, Type VD

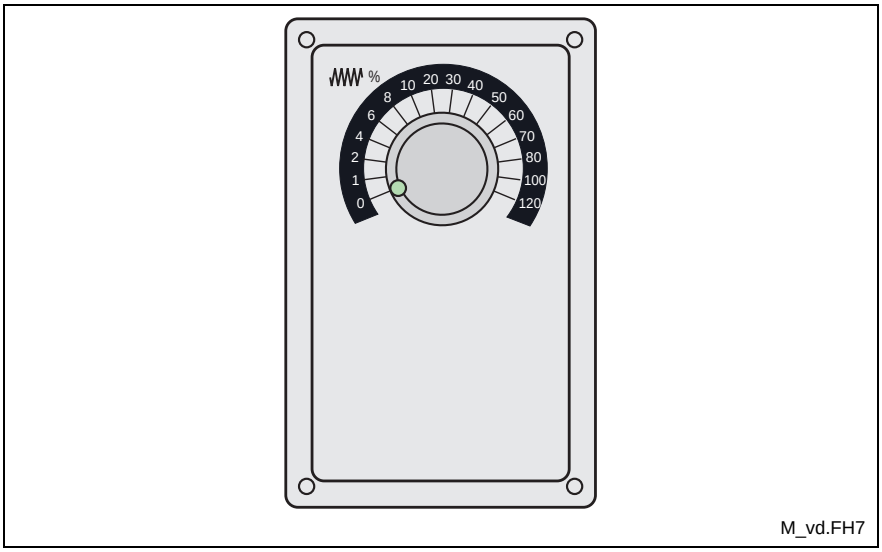


Fig. 4-25: Feed module, type VD

This module for special machines provides one Gray code override switch for feed and spindle.

Address Assignment when Installing on the Left Module Slot

Inputs

Switching element / position	Address
Override bit 0	I *.8.0
Override bit 1	I *.8.1
Override bit 2	I *.8.2
Override bit 3	I *.8.3

Fig. 4-26: Address of the override switch

Address Assignment when Installing on the Right Module Slot

Inputs

Switching element / position	Address
Override bit 0	I *.9.0
Override bit 1	I *.9.1
Override bit 2	I *.9.2
Override bit 3	I *.9.3

Fig. 4-27: Address of the override switch

Gray Code Table

The output signals of the override switch are delivered by a 4 bit Gray code switch with the following assignment:

Scale value	Bit 0	Bit 1	Bit 2	Bit 3
0 %				
1 %	X			
2 %	X	X		
4 %		X		
6 %		X	X	
8 %	X	X	X	
10 %	X		X	
20 %			X	
30 %			X	X
40 %	X		X	X
50 %	X	X	X	X
60 %		X	X	X
70 %		X		X
80 %	X	X		X
100 %	X			X
120 %				X

Fig. 4-28: Gray code table of the VD module

4.7 Feed Module, Type VE

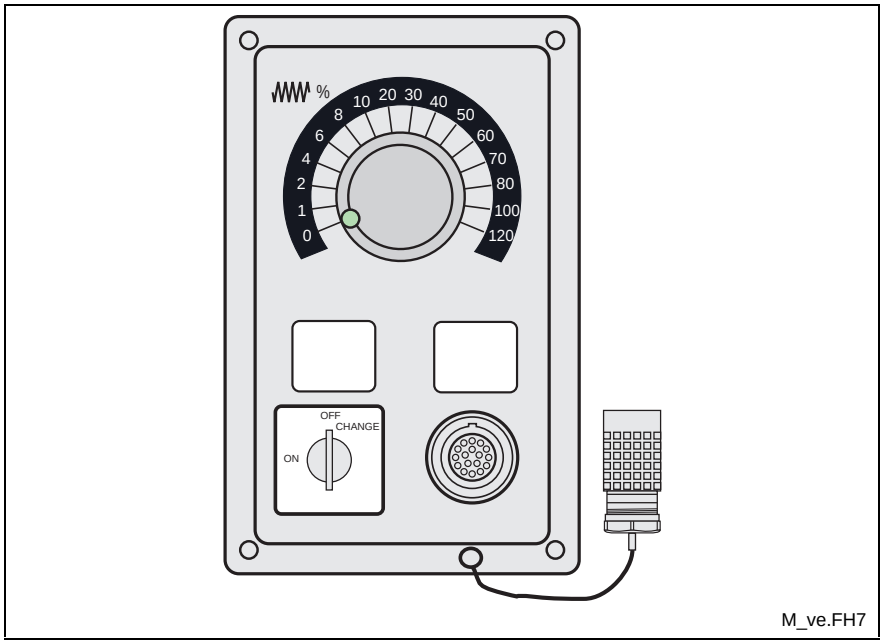


Fig. 4-29: Feed module, type VE

This module provides a Gray code override switch, a key switch as well as a connection for a mobile operator terminal BTC06.2.

The connection for the mobile operator terminal is provided with two emergency stop circuits, which are jumpered via the short-circuit connector in the normal operating mode. To connect a mobile operator terminal, the emergency stop contacts of the female connector are jumpered during the plug-in process with the key switch located besides the female connector in position right (spring return). For this version, only two enabeling circuits are used, the third is guided via the key switch.

Switching Positions of the Key Switch

See chapter 4.4 Emergency stop module, type ND/NE.

Address Assignment when Installing on the Left Module Slot

Inputs

Switching element / position	Address
Override bit 0	I *.8.0
Override bit 1	I *.8.1
Override bit 2	I *.8.2
Override bit 3	I *.8.3
Auxilary contact for key switch	I *.8.4

Fig. 4-30: Address of the override switch

Address Assignment when Installing on the Right Module Slot

Inputs

Switching element / position	Address
Override bit 0	I *.9.0
Override bit 1	I *.9.1
Override bit 2	I *.9.2
Override bit 3	I *.9.3
Auxilary contact for key switch	I *.9.4

Fig. 4-31: Address of the override switch

Gray Code Table

The output signals of the override switch are delivered by a 4 bit Gray code switch with the following assignment:

Scale value	Bit 0	Bit 1	Bit 2	Bit 3
0 %				
1 %	X			
2 %	X	X		
4 %		X		
6 %		X	X	
8 %	X	X	X	
10 %	X		X	
20 %			X	
30 %			X	X
40 %	X		X	X
50 %	X	X	X	X
60 %		X	X	X
70 %		X		X
80 %	X	X		X
100 %	X			X
120 %				X

Fig. 4-32: Gray code table of the VE module

4.8 Module, Type KB

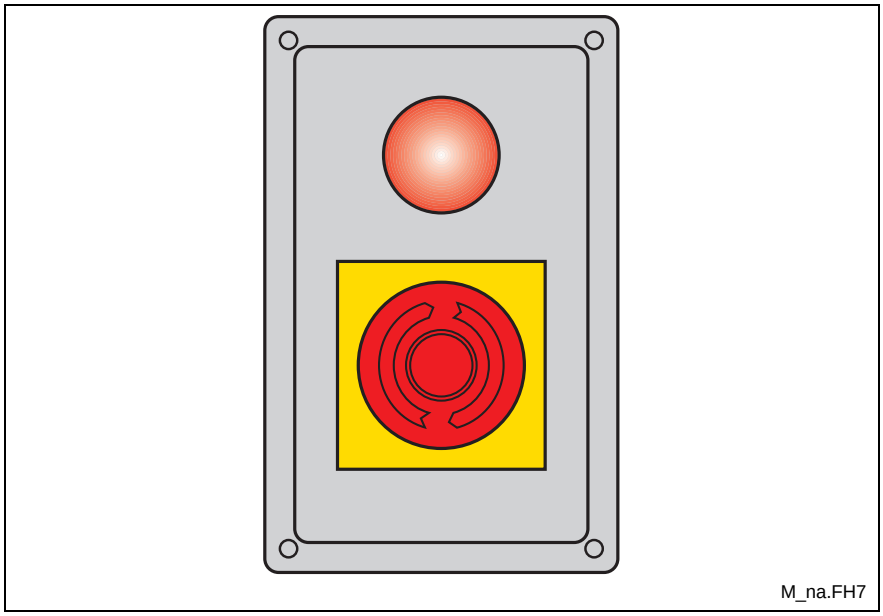


Fig. 4-33: Module type KB

Module KB provides a key switch with two switching positions. The key switch contacts (two NC contacts, two NO contacts) are unwired and can therefore only be used for external wiring. The contacts have to be connected by the user. To be able to move the strands towards the outside, there are half-round cutouts at the bottom side of the housing.

The key switch positions can be labeled by an insert strip.

4.9 Emergency Stop Module, Type NB

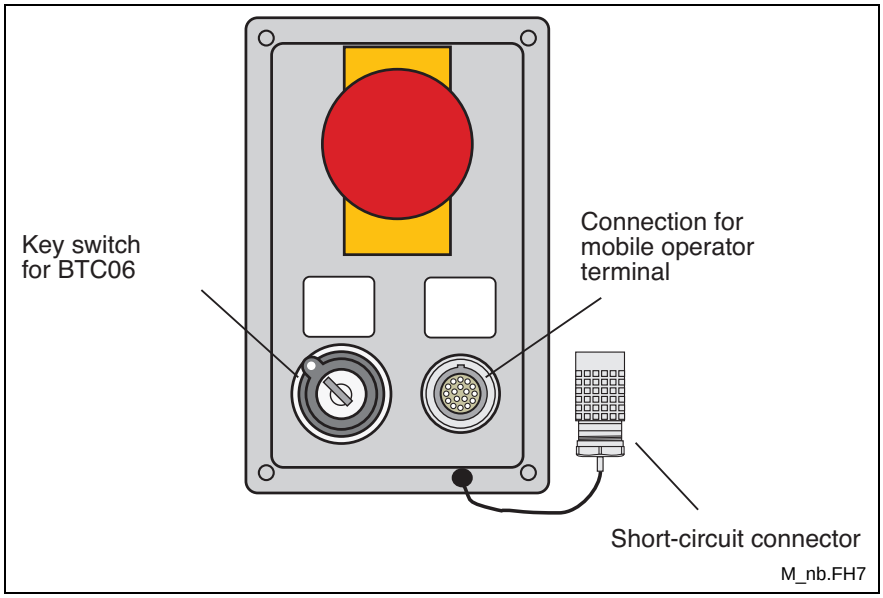


Fig. 4-34: Emergency stop module, type NB

The module NB has in addition to the emergency stop pushbutton a BTC06.2 connection as well as a key switch to connect a mobile operator terminal (explanation of the key switch position see Fig. 4-18) if required.

From the emergency stop pushbutton a NC contact is looped into each of the two emergency stop circuits. Another NC contact is connected to the INTERBUS as auxilary contact.

The connection for the mobile operator terminal is provided with two emergency stop circuits, which are jumpered via the short-circuit connector in the normal operating mode. To connect a mobile operator terminal, the emergency stop contacts of the female connector are jumpered during the plug-in process with the key switch located besides the female connector in position right (spring return). For this version, only two enabeling circuits are used, the third is guided via the key switch.

Switching Positions of the Key Switch

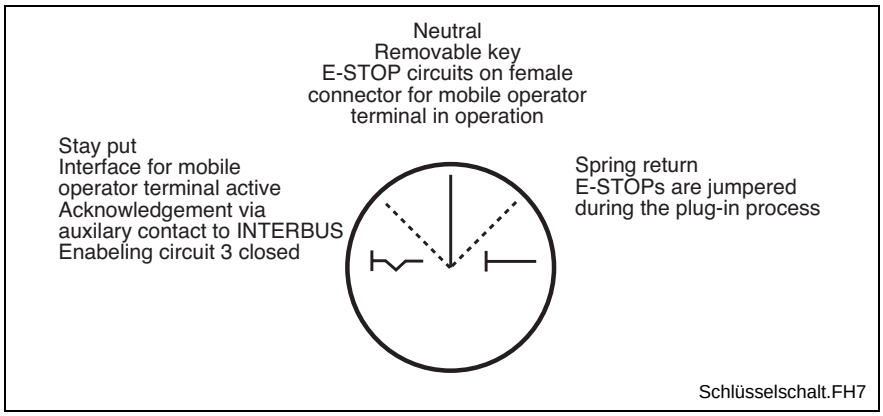


Fig. 4-35: Switching positions of the key switch

Switching Position in the Center:

- Function: Neutral
- Removable key, no contact closed, interface for BTC06.2 not activated and switched in loop through mode to the subsequently connected BTA.

Switching Position on the Right (Spring Return)

- Function: During plugging-in the mobile operator terminal BTC06.2 the two emergency stop circuits are jumpered.
- Non-removable key, contacts closed to jumper the two emergency stop circuits, interface for BTC06.2 not activated and switched in loop through mode to the subsequently connected BTA. In this position the short-circuit connector at the connection for the mobile operator terminal can be removed and replaced by the BTC06.2 connector without interrupting the two emergency stop circuits.

Switching Position on the Left (Stay Put):

- Function: Mobile operator terminal active
- Non-removable key, interface for the BTC06.2 activated, no loop through mode to the subsequently connected BTA, INTERBUS input "Auxilary contact for key switch" on log. 1, enabeling circuit 3 closed on BTA connector X1.

Address Assignment when Installing on the Left Module Slot

Inputs

Switching element / position	Address
Auxilary contact: E-STOP	I *.8.0
Acknowledgment contact for key switch	I *.8.4

Fig. 4-36: Address of the auxilary contact in the E-STOP module

Address Assignment when Installing on the Right Module Slot

Inputs

Switching element / position	Address
Auxilary contact: E-STOP	I *.9.0
Acknowledgment contact for key switch	I *.9.4

Fig. 4-37: Address of the auxilary contact in the E-STOP module

4.10 Feed Module, Type VA

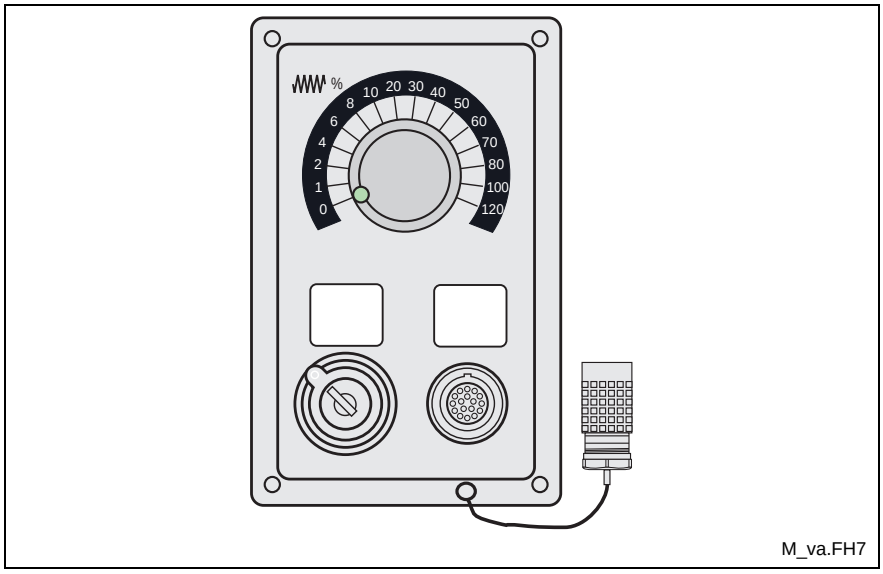


Fig. 4-38: Feed module, type VA

This module provides a Gray code override switch, a key switch as well as a connection for a mobile operator terminal BTC06.2.

The connection for the mobile operator terminal is provided with two emergency stop circuits, which are jumpered via the short-circuit connector in the normal operating mode. To connect a mobile operator terminal, the emergency stop contacts of the female connector are jumpered during the plug-in process with the key switch located besides the female connector in position right (spring return). For this version, only two enabeling circuits are used, the third is guided via the key switch.

Switching Positions of the Key Switch

See chapter 4.9 Emergency stop module, type NB.

Address Assignment when Installing on the Left Module Slot

Inputs

Switching element / position	Address
Override bit 0	I *.8.0
Override bit 1	I *.8.1
Override bit 2	I *.8.2
Override bit 3	I *.8.3
Auxilary contact for key switch	I *.8.4

Fig. 4-39: Address of the override switch

Address Assignment when Installing on the Right Module Slot

Inputs

Switching element / position	Address
Override bit 0	I *.9.0
Override bit 1	I *.9.1
Override bit 2	I *.9.2
Override bit 3	I *.9.3
Auxilary contact for key switch	I *.9.4

Fig. 4-40: Address of the override switch

Gray Code Table

The output signals of the override switch are delivered by a 4 bit Gray code switch with the following assignment:

Scale value	Bit 0	Bit 1	Bit 2	Bit 3
0 %				
1 %	X			
2 %	X	X		
4 %		X		
6 %		X	X	
8 %	X	X	X	
10 %	X		X	
20 %			X	
30 %			X	X
40 %	X		X	X
50 %	X	X	X	X
60 %		X	X	X
70 %		X		X
80 %	X	X		X
100 %	X			X
120 %				X

Fig. 4-41: Gray code table of the VA module

4.11 Interface Switch-over for the Left / Right Module Slot

In addition, for all BTA20 modules with connection for a mobile operator terminal BTC06.2 it is necessary to adjust the switch on the rear side of the device (see Fig. 4-42) in the right way. The switching position depends on the module slot, on which the module with the connection for a mobile operator terminal was mounted. If the switch was not adjusted in the right way, i.e. corresponding to the module slot, a connected BTC06 is not able to operate. The switch provides the enabling of the interface block.

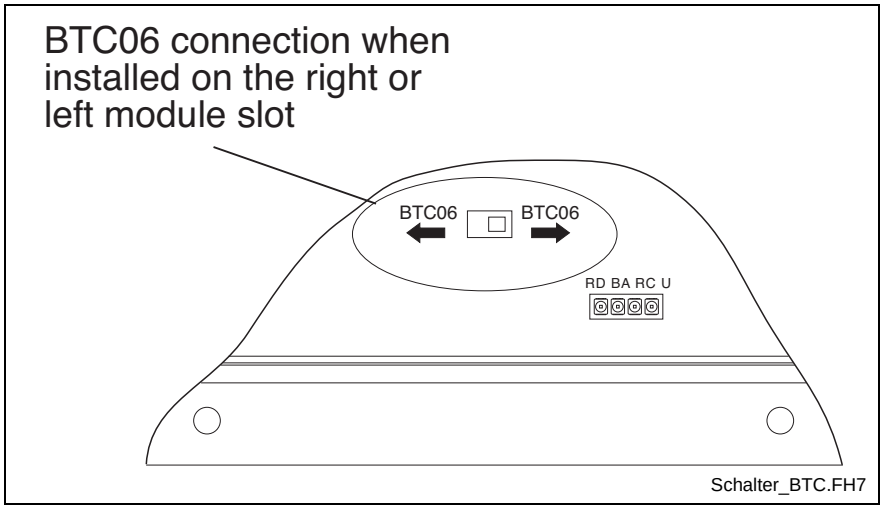


Fig. 4-42: Position of the switch for the BTC06.2 connection on the right-hand / left-hand side

5 Bus Systems

5.1 Overview

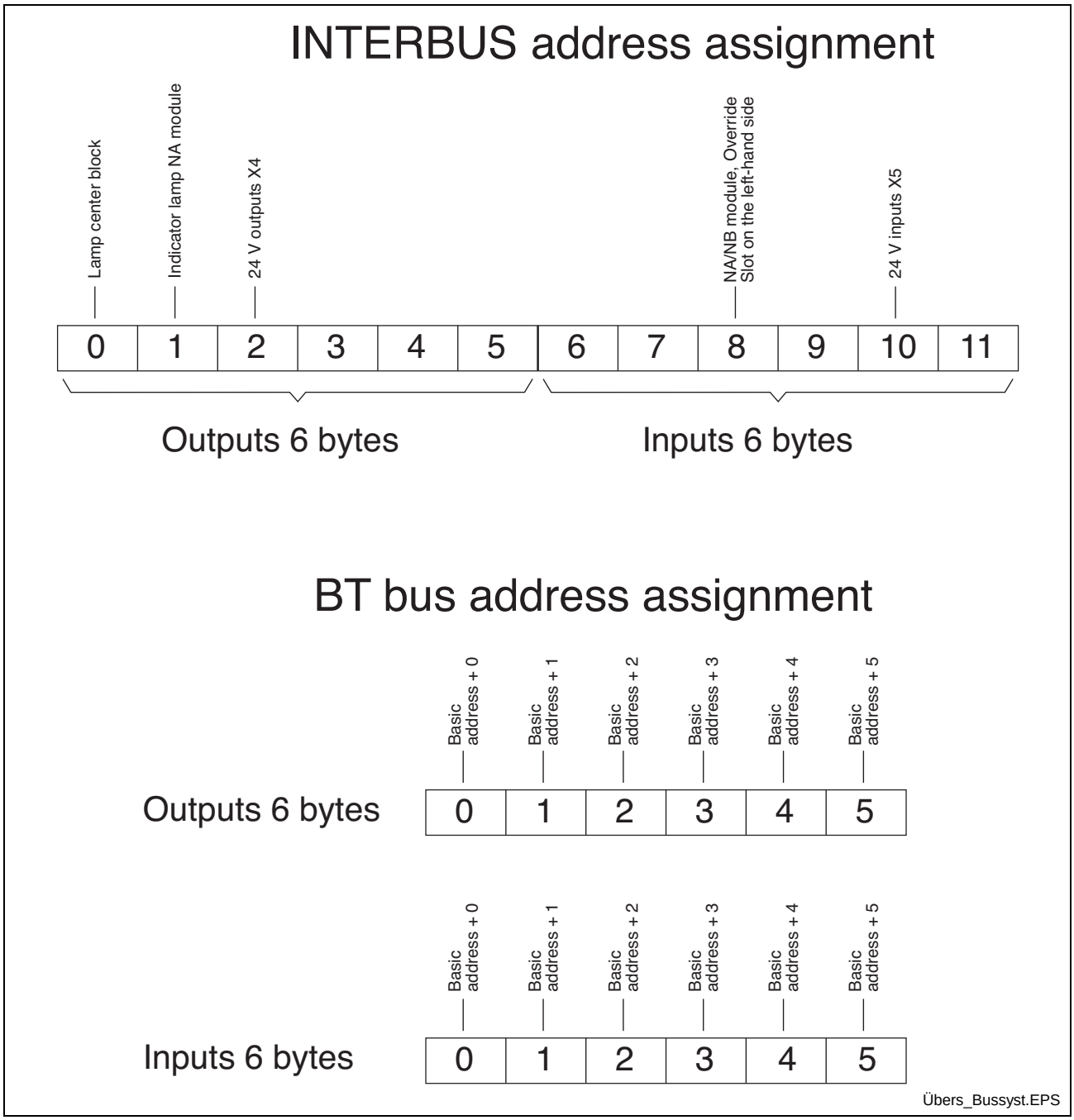


Fig. 5-1: Overview of the address assignments of the used bus systems

5.2 INTERBUS

Special Features of the INTERBUS

- INTERBUS ID code 3 (digital devices with inputs and outputs)
- Remote bus, 500 kbaud with 2 conductors
- Data width of the unit is 3 words, i. e. 48 bits.
  24 outputs, 40 inputs
- All inputs for 24 volt level,
  32 inputs for internal module and switching elements without electrical isolation ,
  further eight inputs (input byte 4) on a 9-pin terminal strip of the INTERBUS unit (X5) with electrical isolation.
- All 24 outputs with 24 volt level,
  16 outputs for internal indicator lamps and modules,
  the remaining 8 as external outputs with electircal isolation on a 10-pin terminal strip of the INTERBUS unit (X4).

Status Indicators

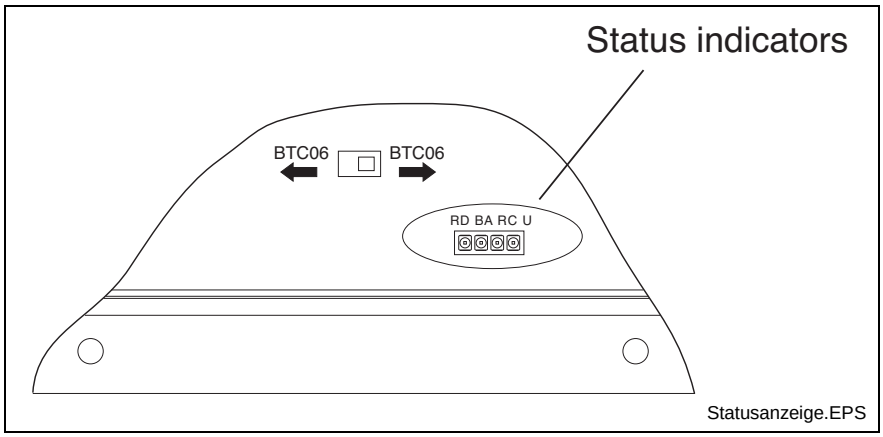


Fig. 5-2: Position of the status indicators

LED	Meaning
RD, red	Remote bus disable flashes, if the remote bus is switched off.
BA, green	Bus active flashes, if an INTERBUS transmission occurs.
RC, green	Remote bus check, monitoring of the incoming INTERBUS cable (X6). RC flashes, if the connection is all right. RC does not flash, when resetting the INTERBUS of the control.
U, green	Power supply is applied.

Fig. 5-3: INTERBUS status LEDs

5.3 BT Bus

With the BT bus up to 4 operator panels of type BTM15/16 or BTA15/16/20 can be connected. The maximum length of a BT bus is **50 m**. This applies not only, if one device is connected, but also if maximum the four reliable devices are connected. A quick access on the I/O data of the operator panels from the PLC (e. g. %IBP*.*) is **not** possible.

The address assignments required for programming can be found in the documents accompanying the devices to be connected.

Addressing

The BT bus is addressed by assigning a logic user number in the I/O editor of the PLC programming interface. Both for the input image memory as well as for the output image memory a separate logic address is assigned.

The two image memories have respectively a seize of 128 bytes, which are provided for the connected operator panels. Depending on the operator panel a certain number of bytes is assigned in the image memory (see Fig. 5-4).

Device type	Memory assignment in the input/output image
BTM15	Depending on the configuration 2 bytes for digital I/Os (always assigned) 2 additional bytes for each module (except handwheel) 4 additional bytes for handwheel module
BTM16	14 bytes
BTA15/16/20	6 bytes

Fig. 5-4: Memory requirements of operator panels

Depending on the physical order of the operator panels connected to the BT bus, the addresses of the devices in the input and output image memory are continuously arranged corresponding to the memory requirements of the operator panels. According to the example in Fig. 5-5 the concept of the memory assignment is demonstrated.

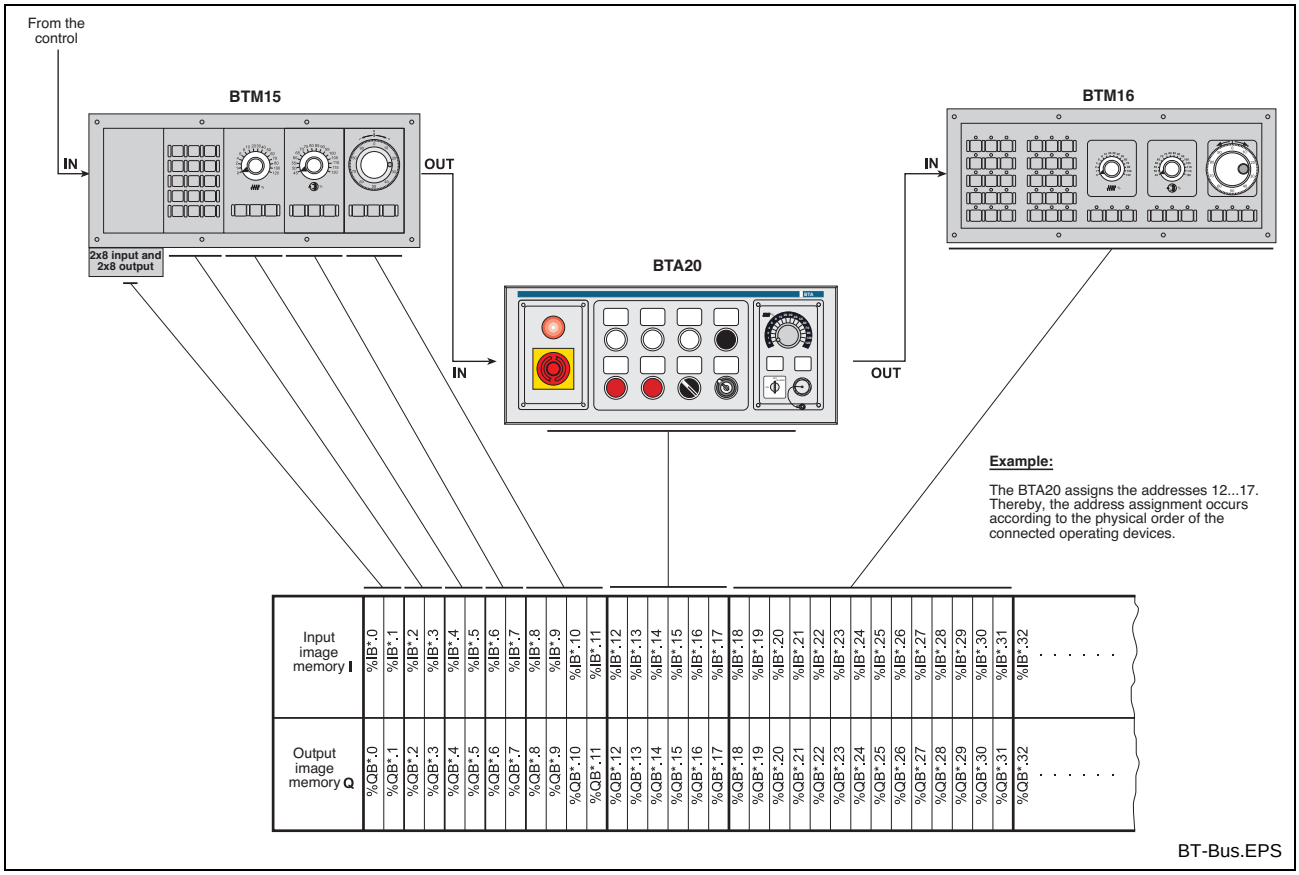


Fig. 5-5: Memory assignment of the BT Bus

6 Technical Data

6.1 General Technical Data

Power Supply	18 - 30 V	
Max. Current Consumption	Approx. 1.0 A	
Max. Power Consumption	Approx. 18 W	
Dimensions (W x H x D)	407 mm x 169 mm x 119 mm	
Mounting Dimensions (W x H x D)	375 mm x 138 mm x 119 mm	
Weight	Approx. 2.1 kg	
Degree of Protection	IP 65 (front panel)	
Color	Light gray (RAL 7035)	
Front Panel Material	Varnished aluminium front panel with holohedrally let in chemical resistant polyester foil	
Maximum ambient temperature (operation)	+5 °C to +45 °C	
Storage temperature	-20 °C to +60 °C	
Air Pressure	860 to 1060 hPa, 1500 m	
Interfaces	1 x RS232 IN	
	1 x RS422 IN	
	1 x RS422 OUT	
	1 x INTERBUS IN	
	1 x INTERBUS OUT	
Data 24 V Inputs	Low level: 0-10 V	
	High level: 18-30 V	
	Input current: < 10 mA	
Data 24 V outputs	Output current per output: 200 mA	
E-STOP	Switching voltage U_{max}	24 V DC / 42 V AC
	Switching current I_{max}	2 A DC / 3 A AC
Enabeling Circuit	Switching voltage U_{max}	24 V DC / 42 V AC
	Switching current I_{max}	2 A DC / 3 A AC

6.2 Interface Converter

Baud Rate	0 to 38400 bauds
Input Voltage RS232	± 5 to ± 12 V
Output Voltage RS422	0/5 V, 5 V diff., max. 60 mA
+5 V Output for Bus Connection	Max. 50 mA

7 Connections

7.1 Position of the Plug-in Connector

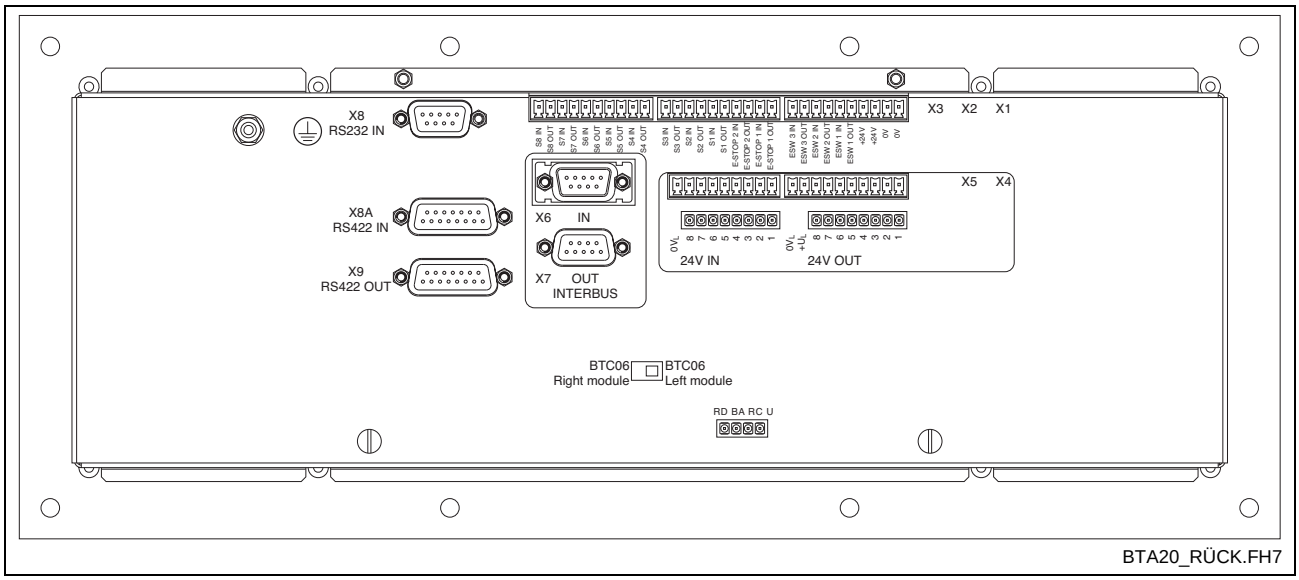


Fig. 7-1: Position of the plug-in connector

7.2 24 V Outputs X4 (Isolated)

Address Assignment

Terminal	Address
X4 - 1	O *.2.0
X4 - 2	O *.2.1
X4 - 3	O *.2.2
X4 - 4	O *.2.3
X4 - 5	O *.2.4
X4 - 6	O *.2.5
X4 - 7	O *.2.6
X4 - 8	O *.2.7

Fig. 7-2: Addresses of the 24 V outputs (X4)

7.3 24 V Inputs X5 (Isolated)

Address Assignment

Terminal	Address
X5 - 1	I *.10.0
X5 - 2	I *.10.1
X5 - 3	I *.10.2
X5 - 4	I *.10.3
X5 - 5	I *.10.4
X5 - 6	I *.10.5
X5 - 7	I *.10.6
X5 - 8	I *.10.7

Fig. 7-3: Addresses of the 24 V inputs (X5)

7.4 INTERBUS Interface IN (X6)

Pin	Signal	Pin	Signal
1	DO1 Data Out 1	2	DI1 Data In 1
3	GnD	4	N. C.
5	N. C.	6	/DO1 Data Out 1
7	/DI1 Data In 1	8	N. C.
9	N. C.		

Fig. 7-4: INTERBUS IN (X6)

7.5 INTERBUS Interface OUT (X7)

Pin	Signal	Pin	Signal
1	DO2 Data Out 2	2	DI2 Data In 2
3	GnD	4	N. C.
5	+ 5 V out	6	DO2 Data Out 2
7	/DI2 Data In 2	8	N. C.
9	RBST		

Fig. 7-5: INTERBUS OUT (X7)

7.6 Interface RS232 IN (X8)

Pin	Signal	Pin	Signal
1	Shield	2	/TxD
3	/RxD	4	DTR
5	GND	6	
7	RTS	8	
9			

Fig. 7-6: RS232 assignment X8

The RS232 input of the interface converter is connected by a line 1:1 switched through (female and male connector) with the serial interface MTS-P.

7.7 Interface RS422 IN (X8A)

Pin	Signal	Pin	Signal
1	Shield	2	N. C.
3	N. C.	4	RS422 RxD+
5	RS422 RxD-	6	N. C.
7	Signal Ground	8	N. C.
9	RS422 TxD+	10	Ground
11	RS422 TxD-	12	+5 V out
13	N. C.	14	N. C.
15	N. C.		

Fig. 7-7: RS422 assignment X8A

7.8 Interface RS422 OUT (X9)

Pin	Signal	Pin	Signal
1	Shield	2	N. C.
3	N. C.	4	RS422 RxD+
5	RS422 RxD-	6	N. C.
7	Signal Ground	8	N. C.
9	RS422 TxD+	10	Ground
11	RS422 TxD-	12	+5 V out
13	N. C.	14	N. C.
15	N. C.		

Fig. 7-8: RS422 assignment X9

7.9 Terminal Strips X1...X3

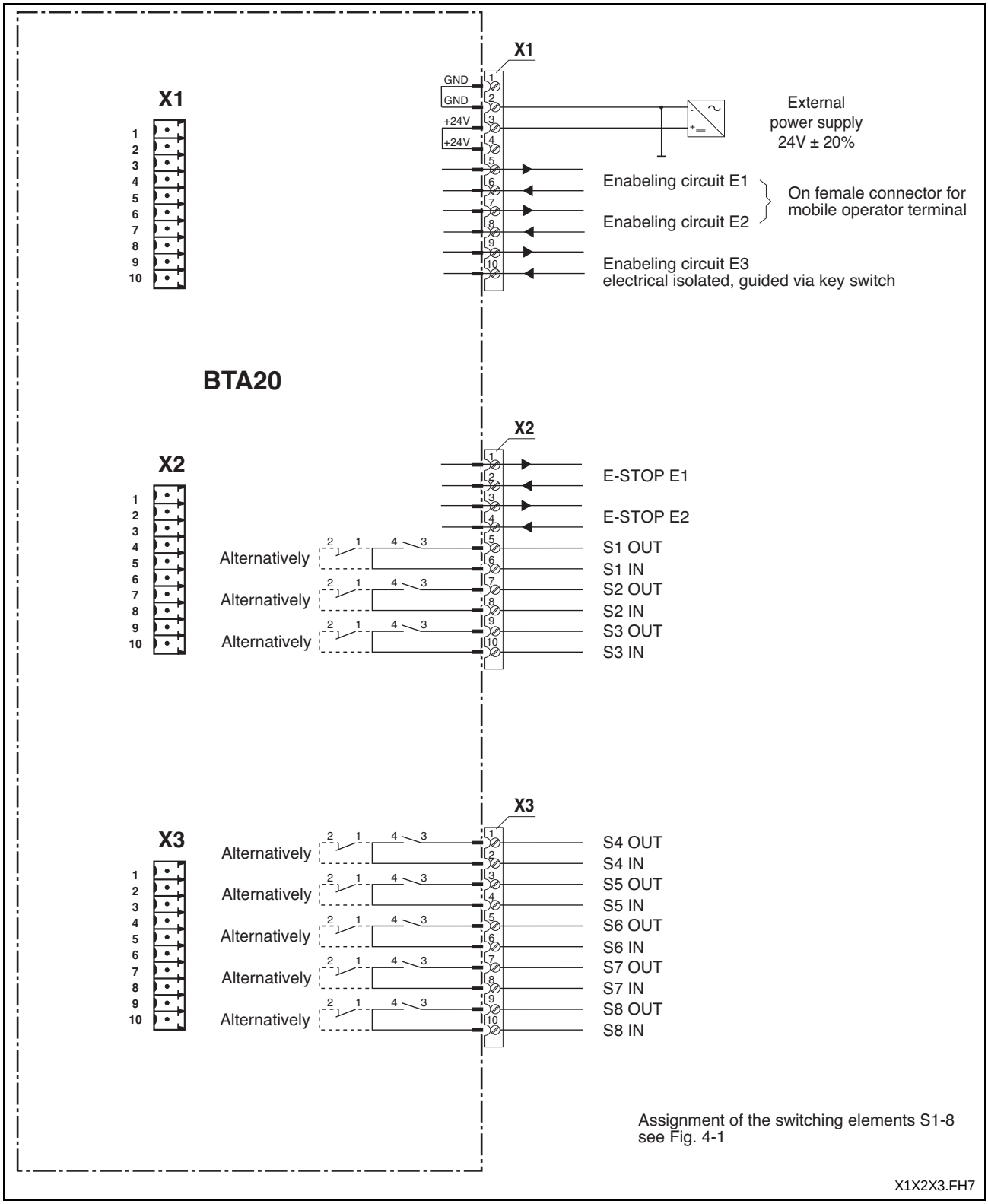


Fig. 7-9: Terminal strips X1...3

7.10 Terminal Strips X4 and X5

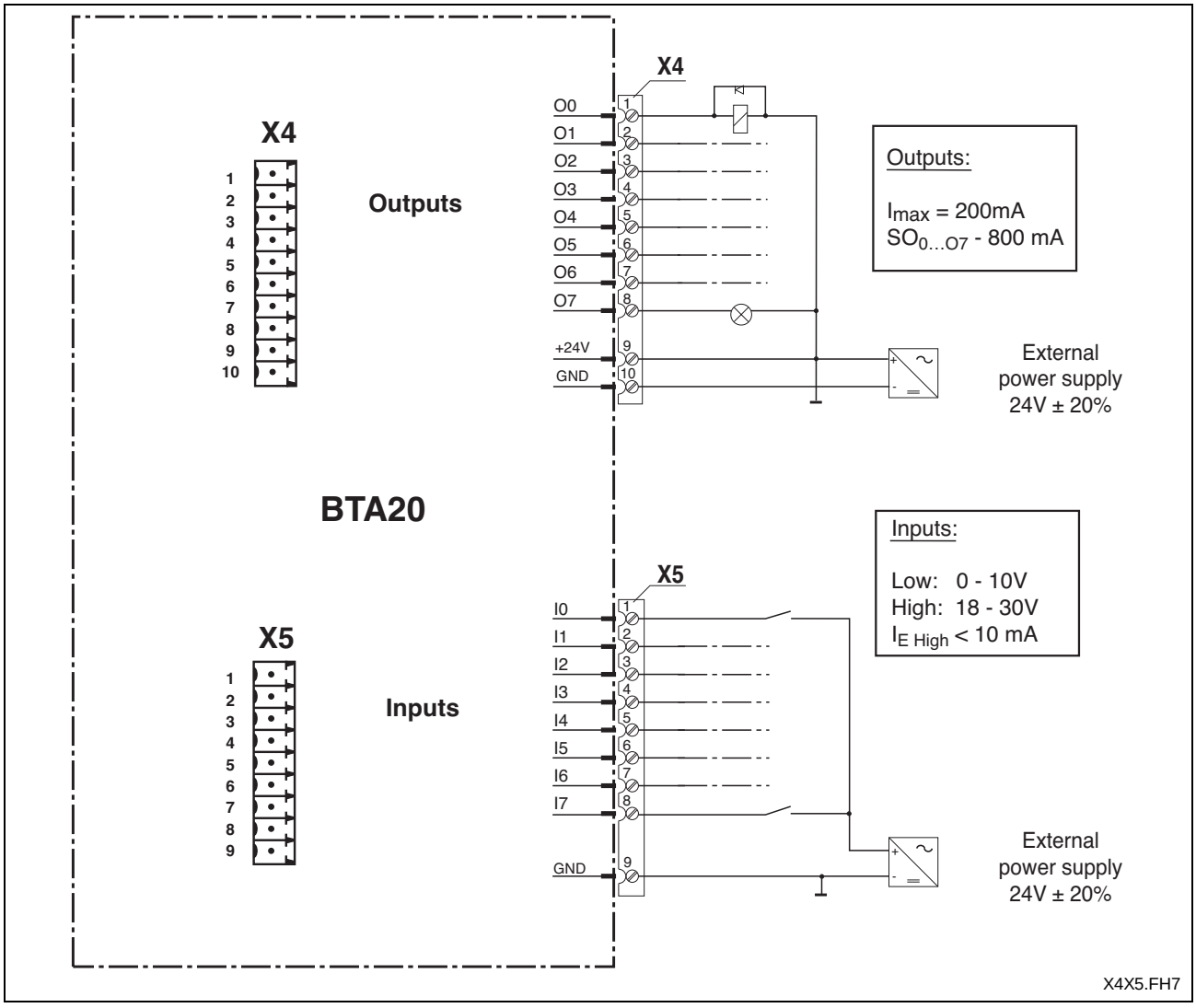


Fig. 7-10: Terminal strips X4 and X5

7.11 E-STOP and Enabeling Circuits

Using the Standard Modules

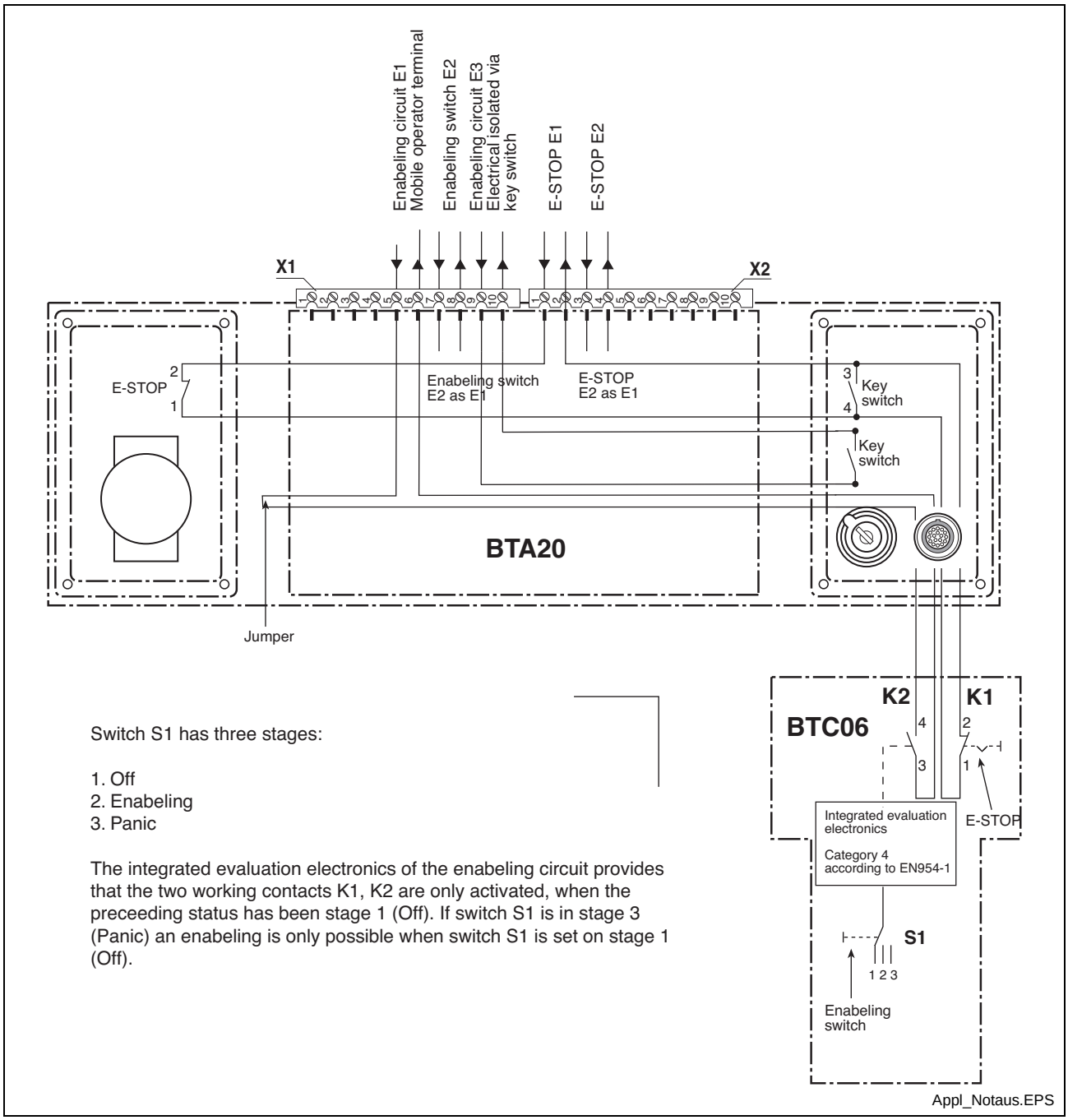


Fig. 7-11: Application example E-STOP and enabeling circuits

In this example the BTA20.3 is illustrated with a BTC06.2. For a better overview only one enabeling and E-STOP circuit is illustrated. For the modules NB/NE and VA/VE enabeling circuits are used with the BTC06.2, the third free circuit can be used by the customer alternatively.

Using the NC Module

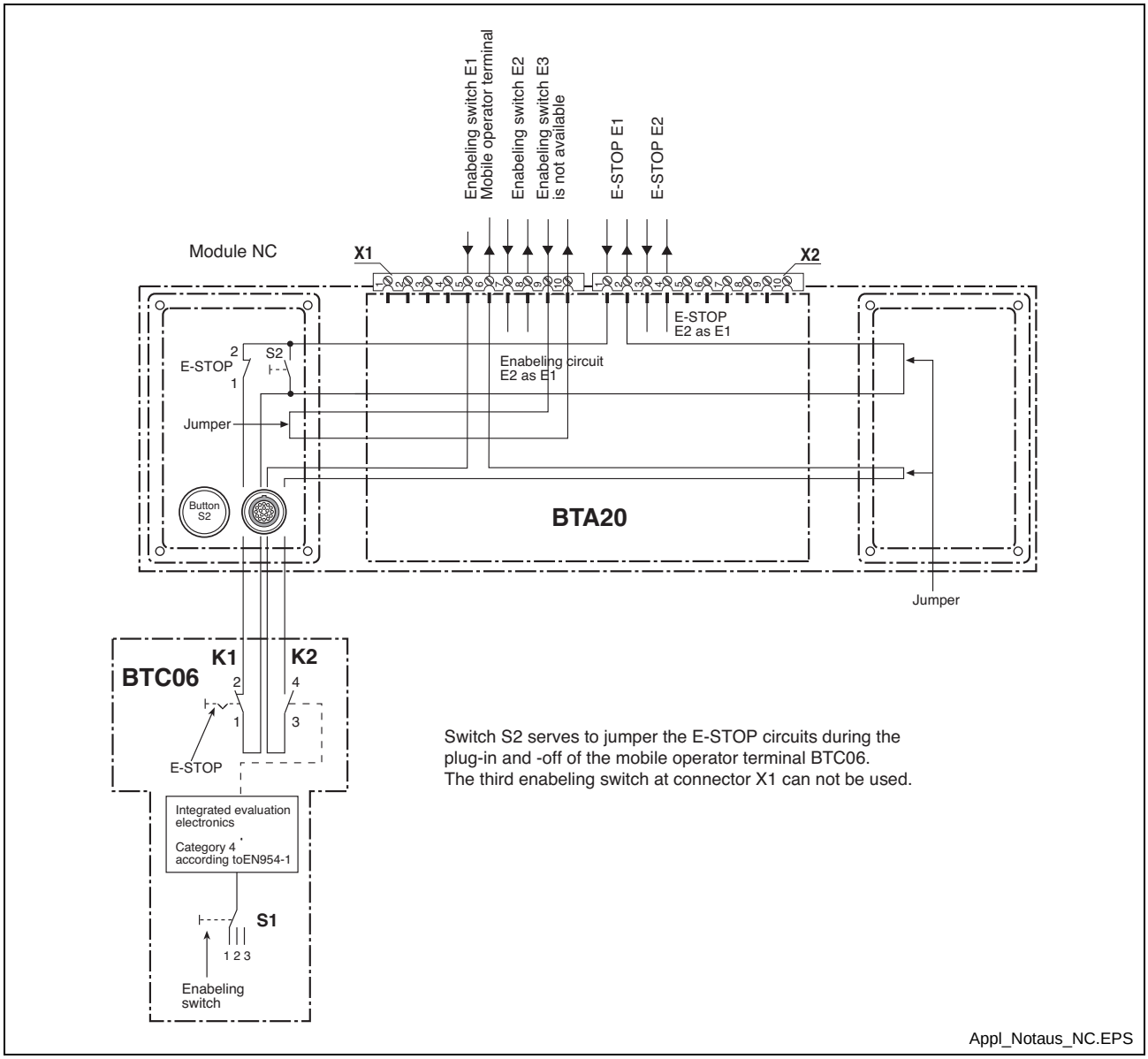


Fig. 7-12: Application example, E-STOP and enabeling circuits with NC module

For this application example a BTA20.3 with NC module is used. As special feature the NC module has a pushbutton instead of the key switch to jumper the E-STOP circuits. Therefore, functional restrictions occur:

- Only **one** BTA20.3 can be used. It is not possible to loop the RS422 interface signals to other BTAs.
- The third enabeling circuit is only looped in this module. Thus, it is not possible to switch the third enabeling circuit. Therefore, it can't be used.

8 Dimensions

8.1 Housing Dimensions

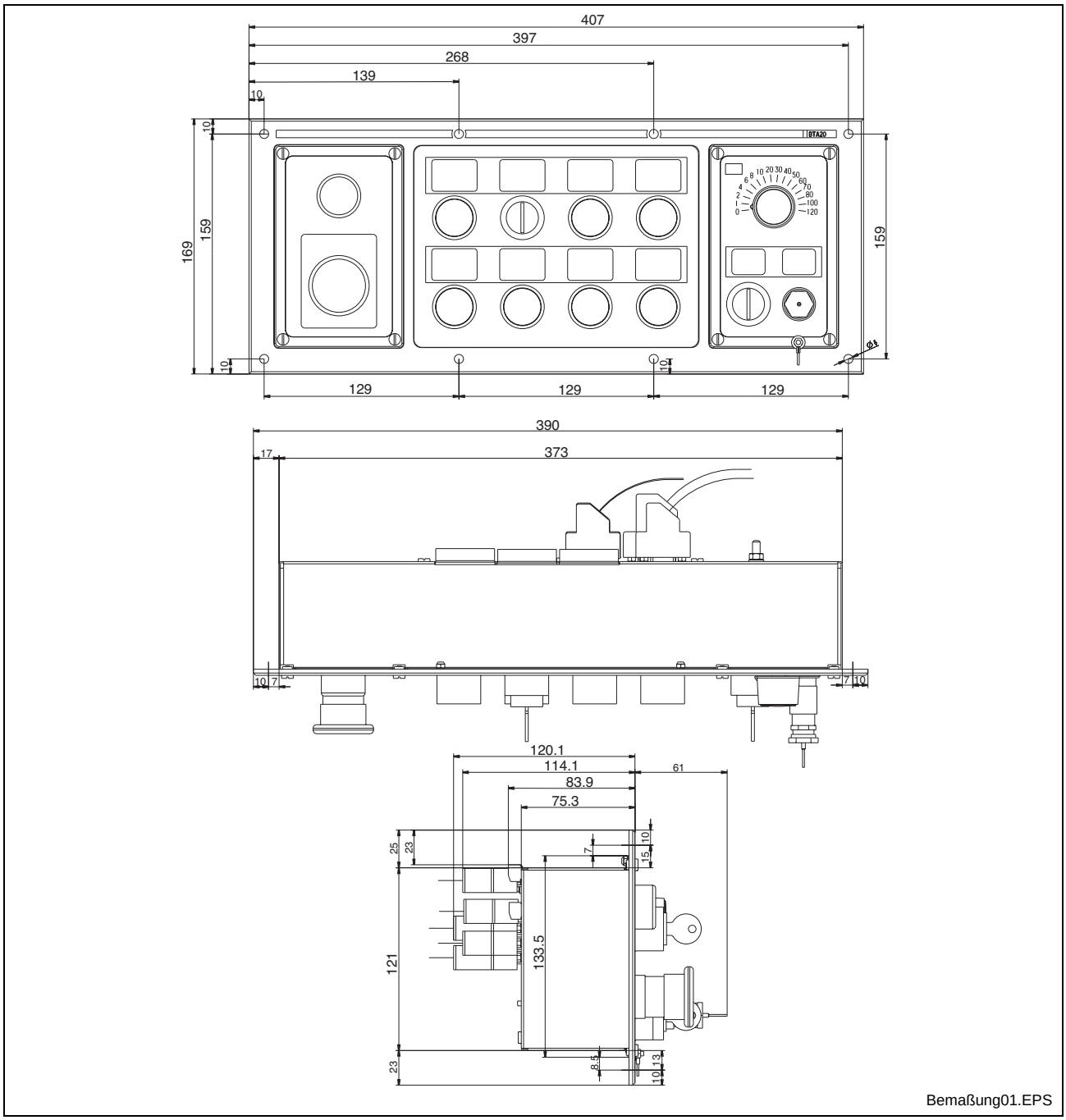


Fig. 8-1: Front, side and top view

8.2 Mounting Dimensions

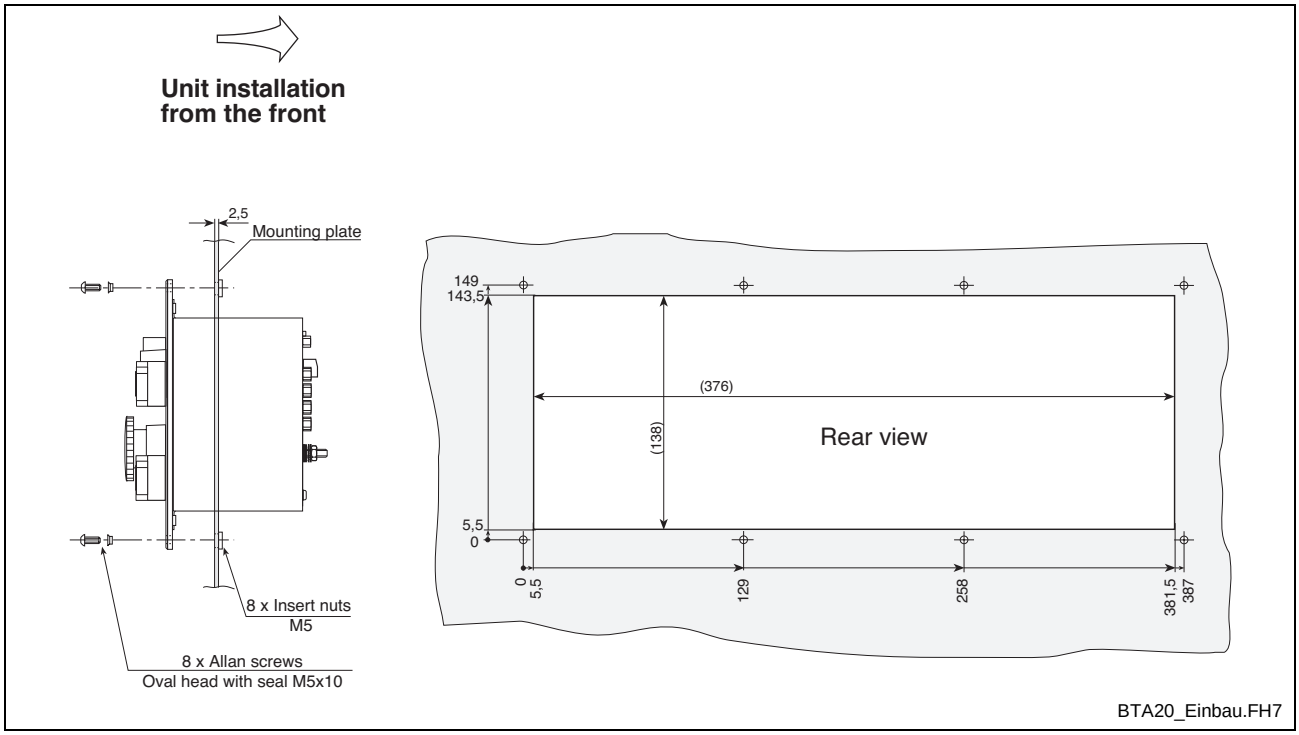


Fig. 8-2: Mounting dimensions

9 Application Examples

9.1 INTERBUS Connections

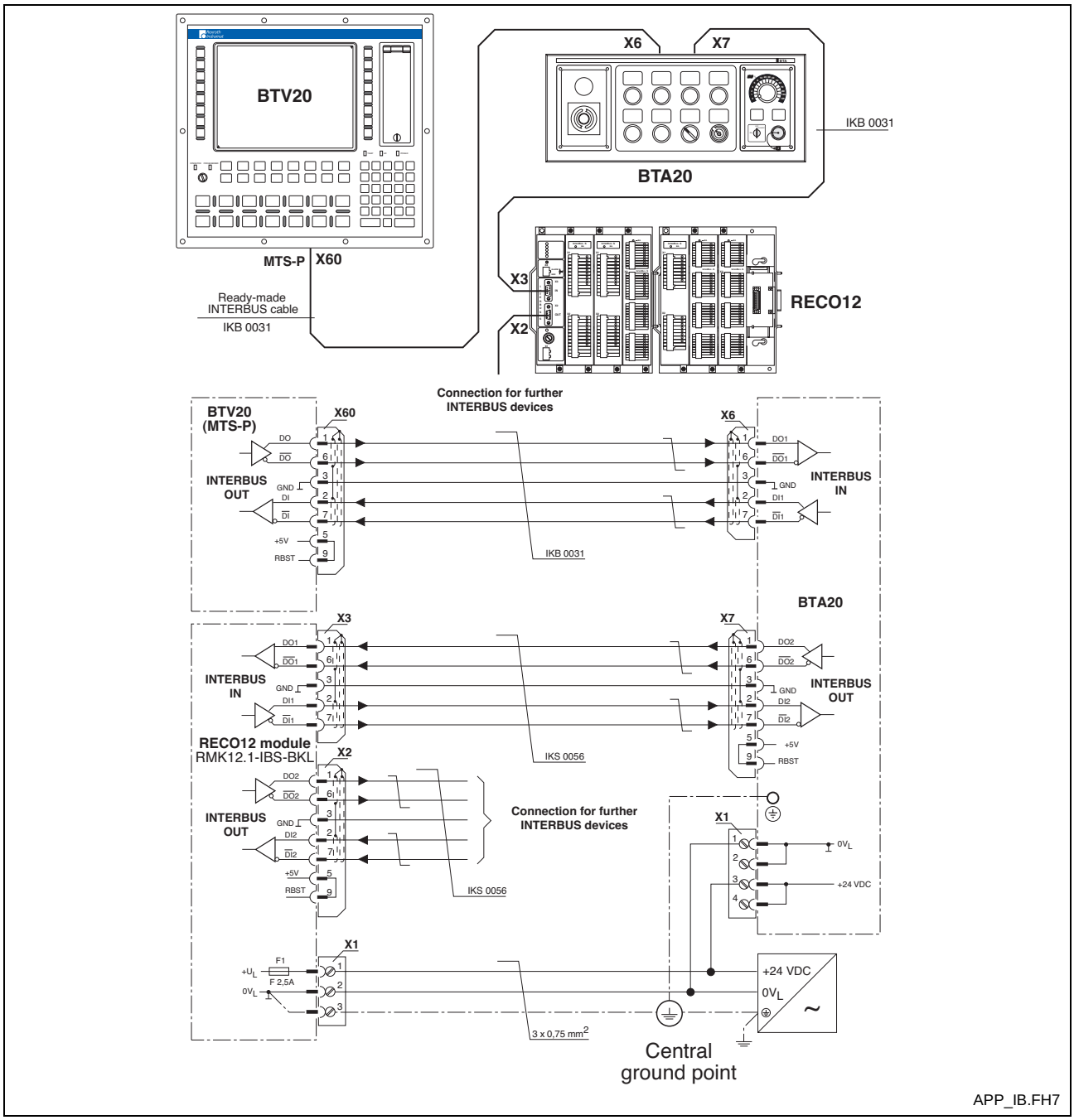


Fig. 9-1: Application example with INTERBUS connection

9.2 General Notes on the BT Bus

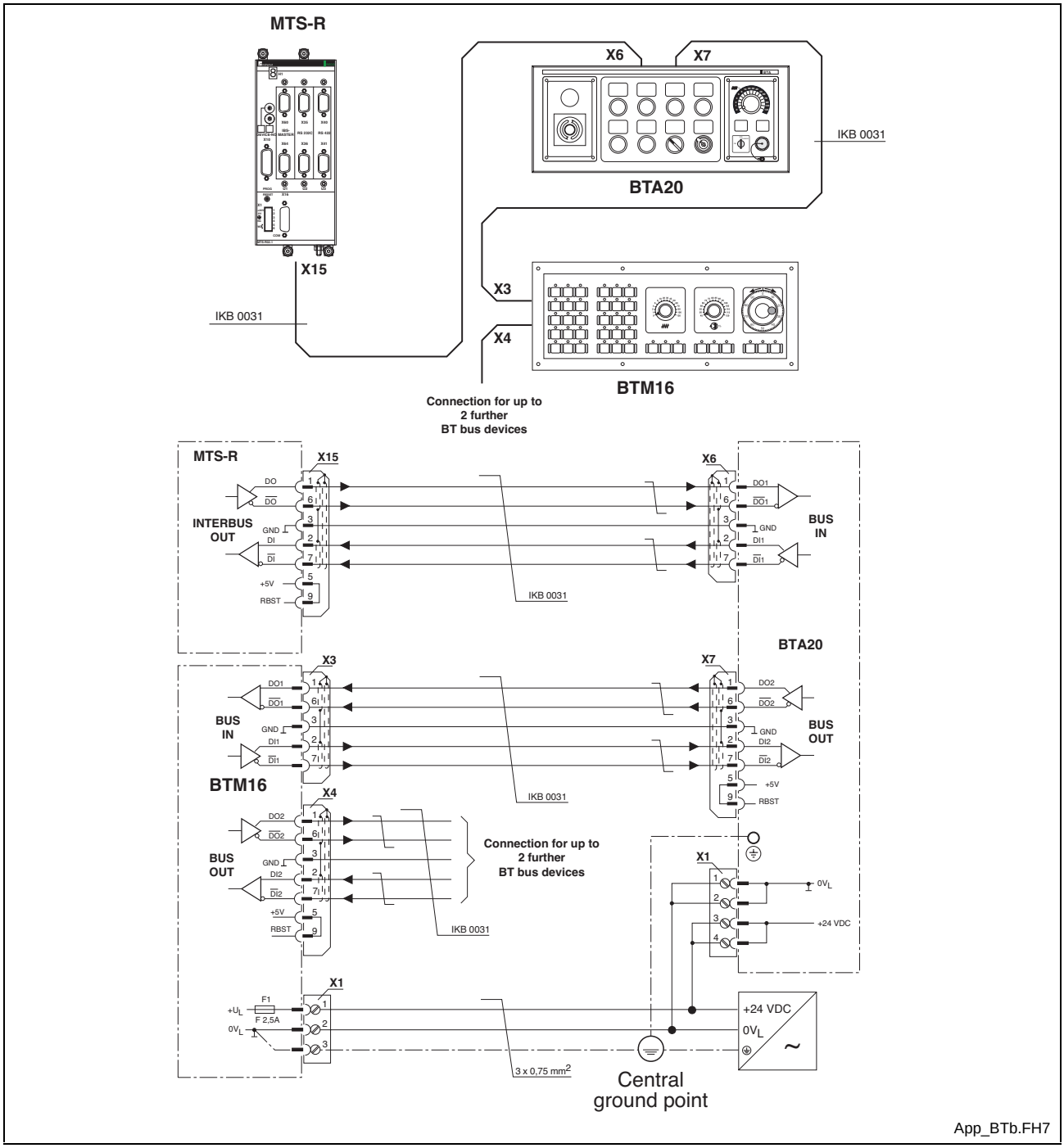


Fig. 9-2: Application example with BT bus connection

9.3 RS422 Wiring with BTV20.3 (MTS-P0x.2), BTC06.2 and Several BTA10.1s

Device Arrangement

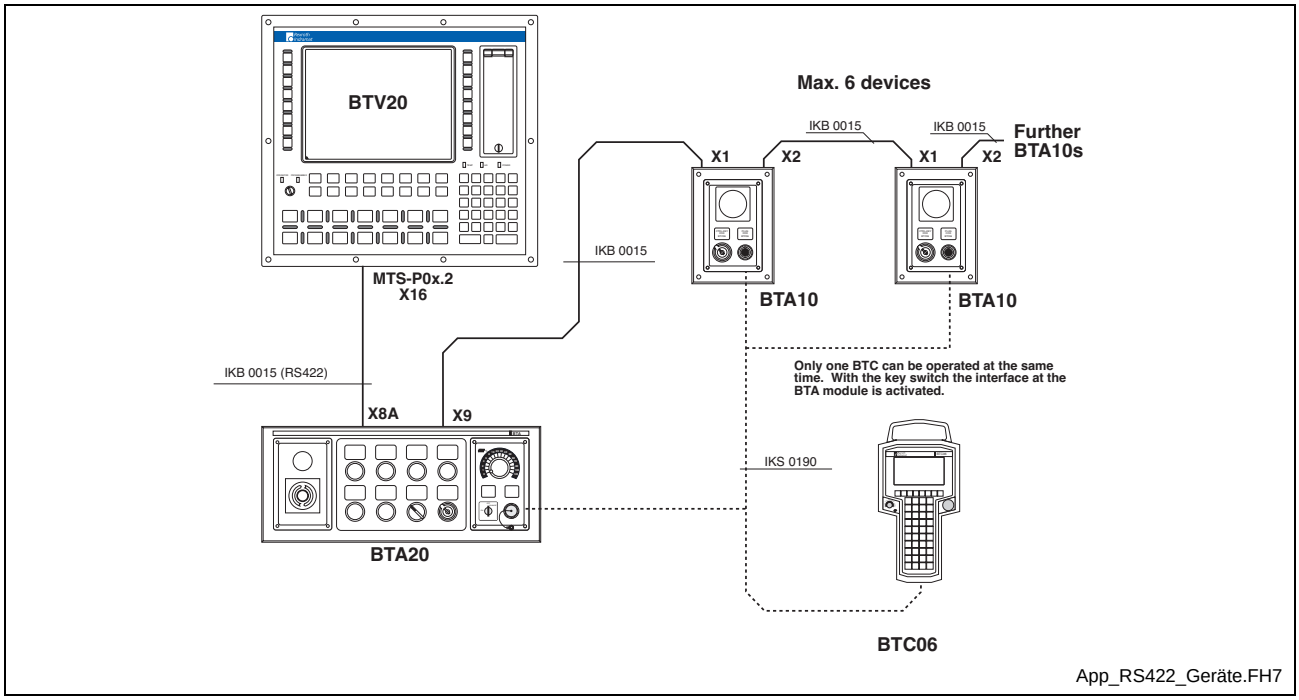


Fig. 9-3: Device arrangement to wire with BTV20.3, BTC06.2 and several BTA10.1s

Wiring of the Application

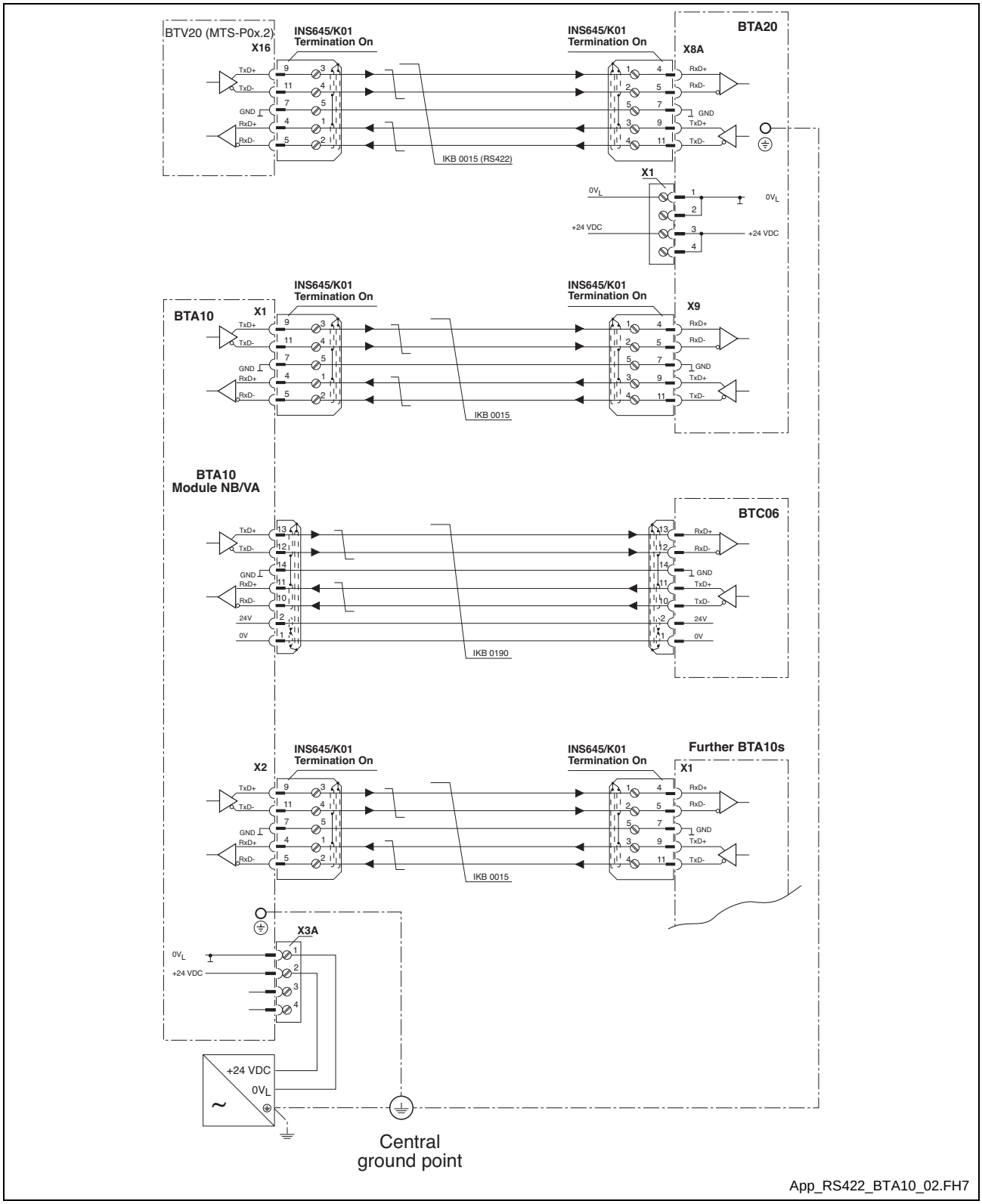


Fig. 9-4: Wiring the RS422 application with BTV20.3, BTC06.2 and several BTA10.1s

10 Special Version

10.1 Brief Description

Within the existing BTA20.3 configurations there's a special version (BTA20.3-**-PN-**-BN) differing in its external dimensions from the standard units. The middle part of the unit is unequipped and without electronics. Here, the user has the possibility to use also 22,5 mm elements. These elements have to be externally wired. The module slots on the left-hand and right-hand side are available as usual. Each module slot is enclosed by a housing. The plug-in connector on the rear side is arranged as illustrated in Fig. 10-1.

10.2 Pin Assignment of the Special Version

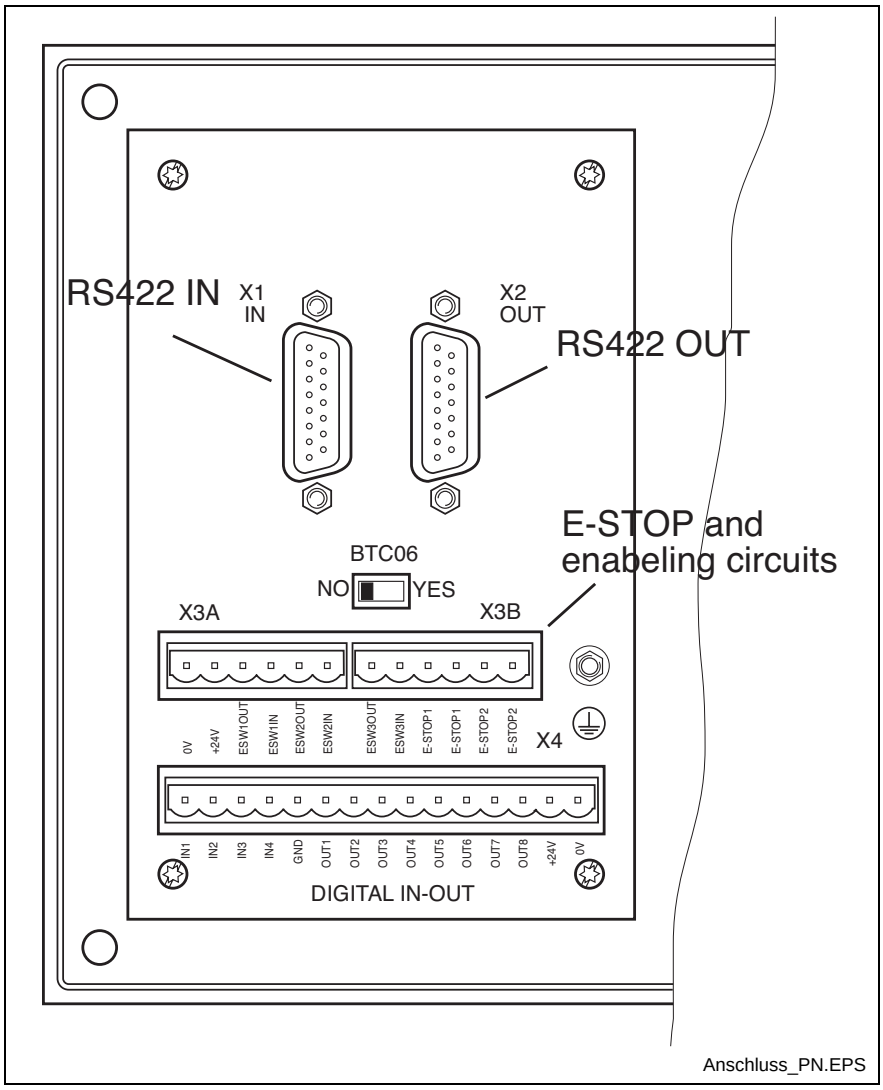


Fig. 10-1: Assignment of the plug-in connectors

Pin Assignment of the Enabeling and E-STOP Circuits

X3A		X3B	
Pin	Signal designation	Pin	Signal designation
1	0V	1	Enabeling circuit 3 OUT
2	24V	2	Enabeling circuit 3 IN
3	Enabeling circuit 1 OUT	3	E-STOP 1 OUT
4	Enabeling circuit 1 IN	4	E-STOP 1 IN
5	Enabeling circuit 2 OUT	5	E-STOP 2 OUT
6	Enabeling circuit 2 IN	6	E-STOP 2 IN

Fig. 10-2: Pin assignment of the enabeling and E-STOP circuits of the special version

Pin Assignment of the Digital Inputs and Outputs (X4)

Pin	Signal designation	Pin	Signal designation
1	In1	2	In2
3	In3	4	In4
5	GND	6	Out1
7	Out2	8	Out3
9	Out4	10	Out5
11	Out6	12	Out7
13	Out8	14	+24V
15	0V		

Fig. 10-3: Pin assignment of the digital In/Out

Interface RS422 (X1 IN, X2 OUT)

Pin	Signal designation	Pin	Signal designation
1	N.C.	2	N.C.
3	N.C.	4	RxD +
5	RxD-	6	N.C.
7	Signal Ground	8	N.C.
9	TxD+	10	Ground
11	TxD-	12	+5 V
13	N.C.	14	N.C.
15	N.C.		

Fig. 10-4: RS422 interface according to Indramat standard

10.3 Housing Dimensions

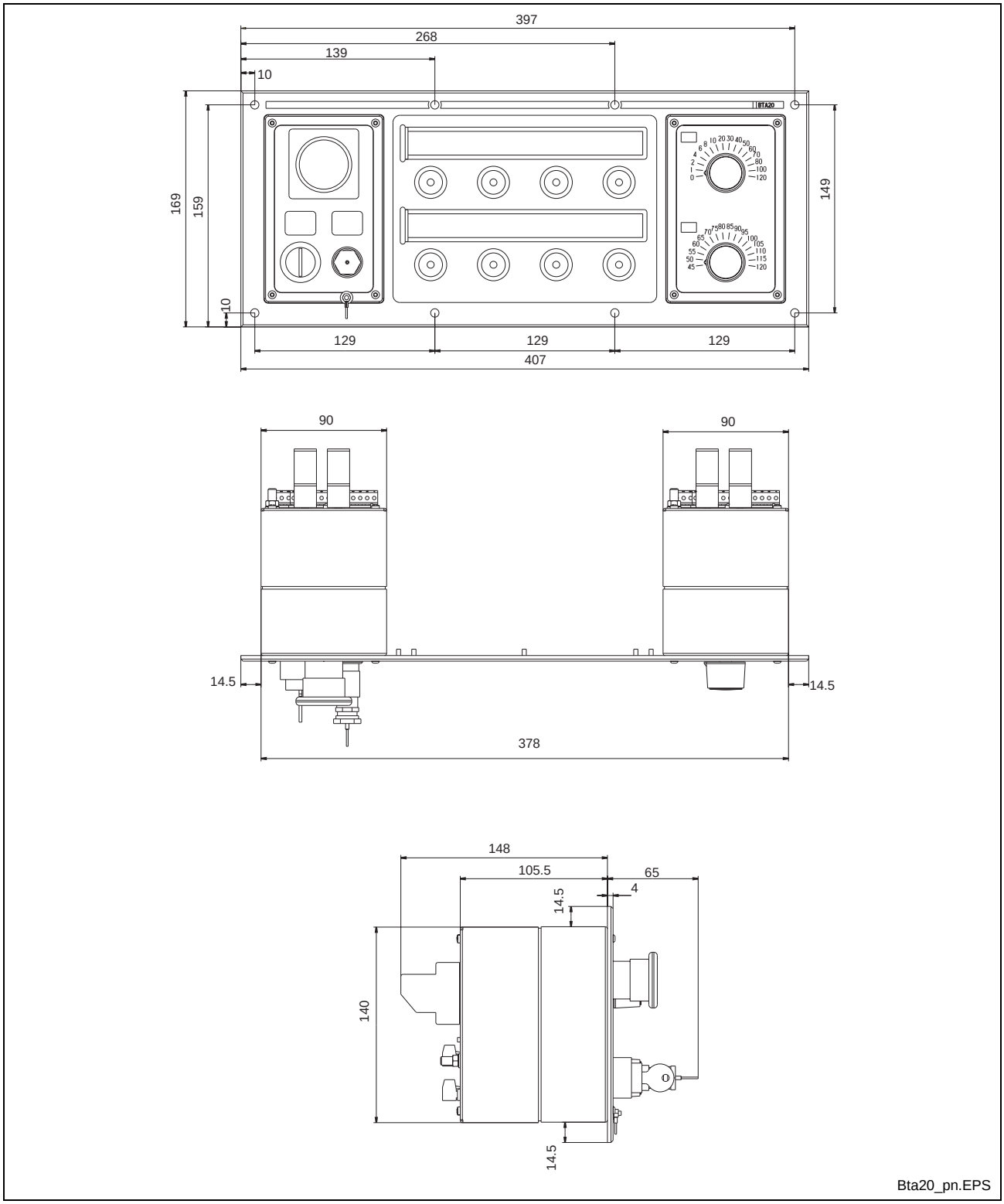


Fig. 10-5: Housing dimensions

11 Ordering Information

11.1 Type Code

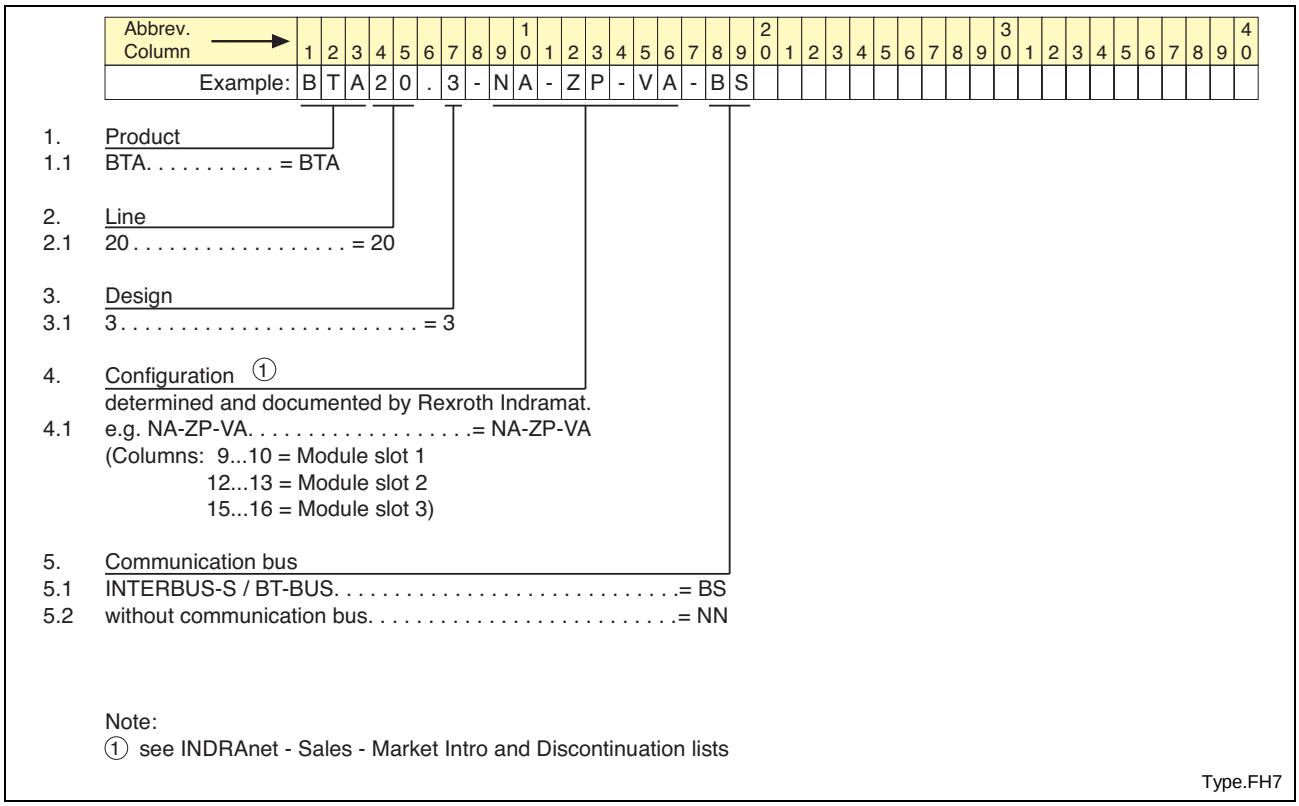


Fig. 11-1: Type code of the BTA20.3

11.2 Accessories

Connectors and Ready-Made Cables

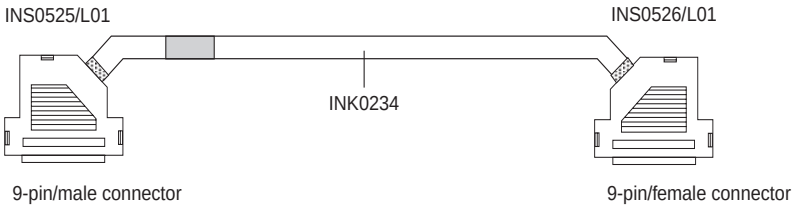
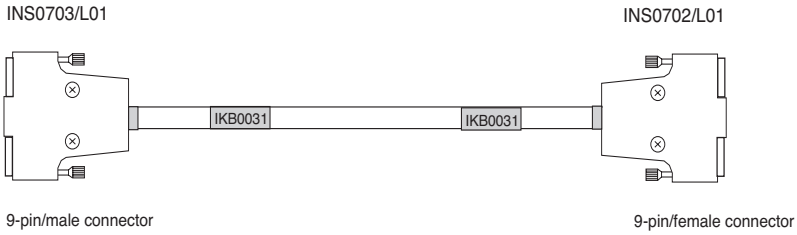
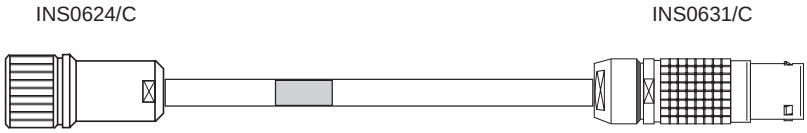
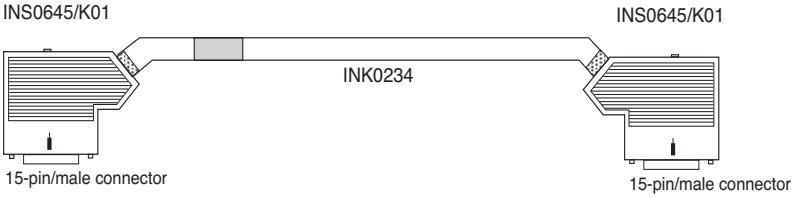
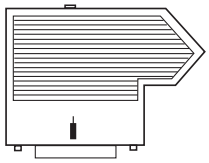
Ordering designation of the ready-made cables	Mating connector of the unit	Rexroth cable	Design of the cable end
IKB0193/000,0 MN: 282 041 (RS232, max. 2m)			
IKB0031/000,0 MN: 291805 **IKB0031/000,5** MN: 291806 (INTERBUS cable)			
IKS0190/000,0 Standard interface cable connection BTC06			
IKB0015/000,0 MN: 282 870 (RS422, max. 400m)			
INS0645/K01 MN: 282 040	 **Connector to be converted by yourself with termination** **INS0645/K01 RS422** (15-pin/male connector)		

Fig. 11-2: Cable accessories of the BTA20.3

Ready-Made Interface Plug

For RS422 communication there's a plug already including a termination in its housing. The cable can be mounted with screw terminals. The pin assignment of the plug is illustrated in Fig. 11-3.

When which plug housing for interface cables is used, is described in chapter 11.2 in the table.

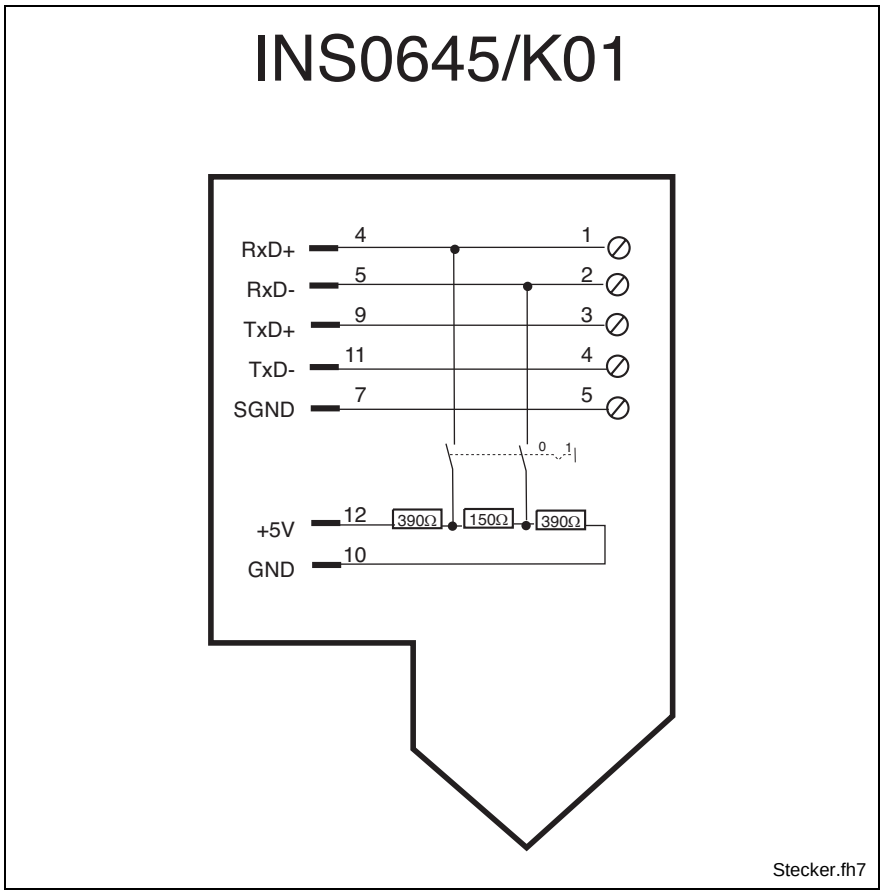


Fig. 11-3: Pin assignment of the ready-made plug housing

The termination can be activated by a switch.

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14 Service & Support

14.1 Helpdesk

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  über Service Call Entry Center - via Service Call Entry Center
  Mo-Fr 07:00-18:00
  Mo-Fr 7:00 am - 6:00 pm
- per Fax - by fax: **+49 (0) 9352 40 49 41**
- per e-Mail - by e-mail: **service.svc@boschrexroth.de**

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After helpdesk hours, contact our service department directly at

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oder - or **+49 (0) 172 660 04 06**

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3. Tel.-/Faxnummern und e-Mail-Adresse, unter denen Sie für Rückfragen zu erreichen sind.

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

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.

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