

Assembly instructions

Installation, commissioning, utilization and maintenance



TST FUZ2

Versions:

-A/ -B/ -C/ -CX /
-CGH / -CXGH
/ -LGH



Attention Important Safety Information

**These instructions must
be observed to ensure
personal safety.**

**Store these instructions
safely.**

DE ACHTUNG! WICHTIGE SICHERHEITSANWEISUNGEN!
Den Hinweisen auf Seite 3 dieser Montageanleitung ist Folge zu
leisten.

GB ATTENTION! IMPORTANT SAFETY INFORMATION!
Follow the instructions on page 3 of this manual.

FR ATTENTION! IMPORTANTES INDICATIONS DE SÉCURITÉ!
Les instructions de la page 3 de cette notice de montage doivent
être observées strictement.

NL LET OP! BELANGRIJKE VEILIGHEIDSINSTRUCTIES!
Volg de instructies op pagina 3 van deze montagehandleiding
op.

IT ATTENZIONE! INDICAZIONI SULLA SICUREZZA
IMPORTANTI!
Prestare attenzione alle note alla pagina 3 delle presenti
istruzioni di montaggio.

ES ATENCION INDICACIONES IMPORTANTES DE SEGURIDAD!
Deben seguirse las indicaciones detalladas en página 3 de
estas instrucciones de montaje.

Notes

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This edition replaces all earlier versions.

The specifications in this document are subject to change without notice.

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This Manual is directed especially at persons involved with commissioning the **TST FUZ2** door controller of FEIG ELECTRONIC GmbH. The installation and commissioning of the controller shall only be carried out by officially trained electrical experts who are familiar with the safety standards of electrical drive and automation technology.

The distributor of the machine is solely responsible for the completeness of the operating instructions for the machine (in this case the door). The installation instructions for the door controller that is installed by the manufacturer of the door shall be supplied in one of the languages of the European Community that is accepted by the manufacturer of the machine.

This Manual shows only a small range of the controllers functions and provides no warranty of properties. Additional functions and descriptions for individual door functions as well as more precise specifications for the controller and hazard warnings are available in the main description.

The compilation of the information in this document has been done to the best of our knowledge and with due diligence. FEIG ELECTRONIC GmbH does not warrant the correctness and completeness of the information in this document. In particular, FEIG ELECTRONIC GmbH cannot be held liable for consequential damages due to incorrect or incomplete information.

In spite of the best efforts, mistakes cannot be avoided completely and we will always gratefully accept any information in this respect.

The installation recommendations contained in this document presume favorable general conditions.

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The description of the products, their utilization, capabilities and performance specifications shall not be considered as warranted properties and are subject to technical change.

General information about this document

Language of the **original operating instructions**: German

The functional description employs the following characters to indicate the different danger areas and useful tips.



indicates a risk to persons if the procedure is not carried out as described.



indicates that the controller is at risk.



points out information which is **IMPORTANT** to the operation of the door controller and/or the door.



points out information which is useful but not essential for the use of the door controller

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Für die Sicherheit von Personen ist es wichtig diesen Anweisungen Folge zu leisten. Diese Anweisungen sind aufzubewahren.

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Pour la sécurité des personnes, il est important de respecter les consignes en question. Les présentes consignes doivent être conservées en lieu sûr.

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NL LET OP! BELANGRIJKE VEILIGHEIDSINSTRUCTIES!

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IT ATTENZIONE! INDICAZIONI SULLA SICUREZZA IMPORTANTI!

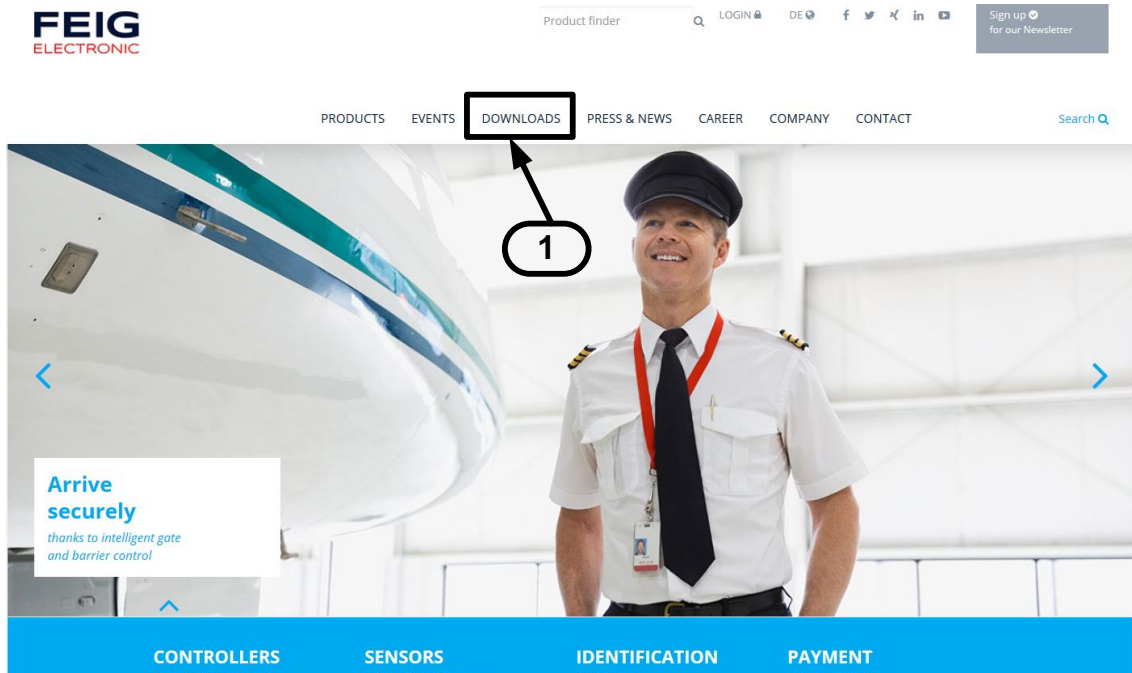
Per la sicurezza personale è importante attenersi scrupolosamente a queste indicazioni. Queste indicazioni vanno conservate.

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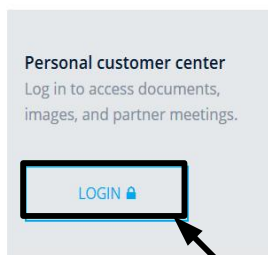
ES ATENCIÓN INDICACIONES IMPORTANTES DE SEGURIDAD

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EU DECLARATION OF CONFORMITY

The EU Declaration of Conformity confirms that the device complies with the Radio Equipment Directive 2014/53/EU (RED) and the RoHS Directive 2011/65/EU. For the following products declarations are available for Download:

Identification (LF, HF, UHF)


[ID ISCMRU102-DoC-RED RoHS-2016-06-14.pdf \(254 K\)](#) 

LOGIN

USER LOGIN

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1 General description and intended use

The device described below is an electronic control system for motor-driven industrial or commercial doors in accordance with *EN 13241*. A fully integrated frequency converter with power output stage can gently control the door with variable opening and closing speeds. The control system **TST FUZ2** is designed to handle electrical induction motors with a power consumption of up to 1.5 kW and a 230 V supply. In addition to controlling the motor that drives the door, the controller can be used for the following tasks:

- Positioning the door at and between its final positions (open, close and intermediate positions)
- To control the drive to run at different speeds (integrated frequency converter)
- Evaluation of the security sensors on the door (e.g. safety edge monitoring, pull-in protection, etc.)
- Evaluation of additional safety equipment on the door (e.g. photo eyes, light curtains, etc.)
- Evaluation of control circuits at the door (e.g. pull switch, radio, inductive loops, etc.)
- Evaluation of emergency stop controls
- Electronically protected 24V low-voltage power supply for sensors and control devices
- 230 V power supply to external units
- Control of application-specific outputs (such as relays for door position reporting)
- Generation and output of diagnostic messages
- Configuration of application-specific parameters for different levels of access of the different user groups
- Control of input/output expansion modules:
 - TST SFFE: plug-in module wireless remote control
 - TST FSx: wireless Security System
 - TST SURA: Safety edge evaluation board
 - TST SUVEK: plug-in module for inductive loop detection
 - TST RFUxK: universal display and input/output module
 - TST RFUxFCOM: interface module for the lock-door applications, etc.
 - TST SRA: connectable module auxiliary relay
 - TST LCD / clear text: Clear text display with 2x16 signs.
 - Evaluation of interface signals for remote control, diagnosis and configuration of the parameters of the door

2 Safety information

ATTENTION

Failure to observe the safety advisories can result in physical harm or damage to the controller.

When starting up and operating the controller, the following important safety advisories as well as the installation and wiring notes must be strictly observed:

In accordance with the EC Machinery Directive only qualified personnel shall install the device on the doors or at the drive units for doors or bring them together. The respective safety requirements for the entire door (machine) must be aligned with the possibilities to meeting these safety requirements on the controller.

Improper integration of the controller into the door complex – e.g. missing sensors, incorrect parameters, speed set excessively high, etc. – presents the risk that the door is operated without adequate safety precautions.

The commissioning of this controller is prohibited until it has been properly attached to the door that conforms with the EC Machinery Directive and for which an EC declaration of conformity according to Annex II of the Directive was obtained.

The following information describes standard applications that may not necessarily match the actual application. The actual application is provided by the manufacturer of the door as part of the overall documentation or as part of the **operating instructions of the door**.

Any installation, startup and maintenance work must only be performed by qualified specialists. In particular, the following regulations must be observed: VDE0100, EN 50110 (VDE0105), EN 60204 (VDE0113), EN 50178 (VDE0160), EN 60335 (VDE0700), fire protection codes, accident prevention regulations as well as the relevant regulations for industrial doors and machine safety standards (EN ISO 13849, EN 62061)(ZH1/494, EN12453, EN12978)

This device is not intended for use by persons (including children) with limited physical, sensory or mental abilities or with a lack of experience and / or knowledge, unless they are supervised by a person responsible for their safety or if they have received instructions on the use of the device. Children should be supervised to ensure that they do not play with the device. Keep remote controls away from such persons.

A device mark (nameplate with name and address of the manufacturer, serial number, model number, supply voltage and temperature range) must be applied by the user.

The example of the warning label must be attached to the motor near the motor terminal board.

Type label (example):



Warning notice label (example):



The safety advisories mentioned in this document make no claim to completeness. If you have questions about the product, contact your vendor.

The manufacturer has carefully checked and inspected the hardware and software, but no warranty is given for a complete absence of errors.



Dispose of the product at the end of its life cycle in accordance with the applicable statutory provisions.

3 Installation of the controller

ATTENTION

IMPORTANT INSTRUCTIONS FOR SAFE INSTALLATION!

Observe all instructions; incorrect installation can result in serious injuries.

- When installing the controller, the system must be turned off.
- The controller may be opened only if all the poles of the supply voltage have been turned off. It is not permitted to turn on or to operate the controller when it is open.
- Disconnect all supply circuits before opening the housing for access to the terminals.
- Before the installation, check the controller for transport or other damages. Under some conditions a damaged controller may result in significant consequential damage to the controller as well as hazards to the user.
- The controller must never be operated with a damaged membrane keypad or Display window. Damaged keypads and Display windows must be replaced.

WARNING

- Do not touch any electronic parts, in particular the components of the processor circuit. Electronic components can be damaged or destroyed by electrostatic discharge.
- Before opening the cover of the enclosure, ensure that no drilling swarf can fall into the housing from the cover.
- When installing the controller it is important to ensure that it is not subject to mechanical stresses.
- Unused cable entries must be sealed to maintain the requirements of IP54.
- Ensure that the cable entries are not subjected to mechanical stresses, in particular tensile stresses.
- The controller must never be operated without the CEE-plug except when the supply voltage can be cut all poles by an installed main switch. The main switch and the CEE-plug must be within easy reach.
- A not rotating motor is no indication of the galvanic isolation from the power grid! The line supply connection terminals, motor terminals and terminals for the brake resistor can still carry dangerous voltages, e.g. under stop or emergency stops.
- If the supply cable is damaged, it must be replaced by the manufacturer or another qualified person in order to avoid danger (like connection type Y EN 60335-1)
- When moving the door in deadman mode, ensure that the operator has an unobstructed view of the door area. In this mode, safety equipment such as safety edge and photo eye may have been defeated. If this is not possible for structural reasons, you must ensure that this mode is only accessible to appropriately trained personnel or that the feature is disabled altogether.
- To prevent damage to the keypad, do not use pointed objects to operate the keys. The keypad is only designed to be operated by human fingers.
- Depending on the type of the door it may be necessary that the door can only be operated when it is within visual range. In these cases, no remote control (e.g. wireless) may be used to issue commands.
- It is important to ensure that the controller is installed with the wall spacers that are supplied to guarantee that the power stage can dissipate heat as necessary.
- The control unit should not be mounted on flammable surfaces (e.g. wood ≤ 2 mm thickness) or in environments with highly flammable substances (e.g. carpentry).
- When the controller is installed in an additional housing, e.g. in a barrier housing, care must be taken to provide a sufficient volume of air around the controller. This must be at least 0.02 m^3 .
- Should cooling not be sufficient, an additional heat sink may be inserted between the controllers housing and the additional housing to dissipate the heat to the outside (see chapter 4.2 Additional heat sink for small housing).

4 Housing options

There are two different housing options available for different device options.



4.1 Housing option 1 / small housing

This type of housing is used for controller types TST FUZ2-A, TST FUZ2-B, and -CX.



The expansion card TST RFUxK can be used in this housing only in combination with controller type TST FUZ2-B.

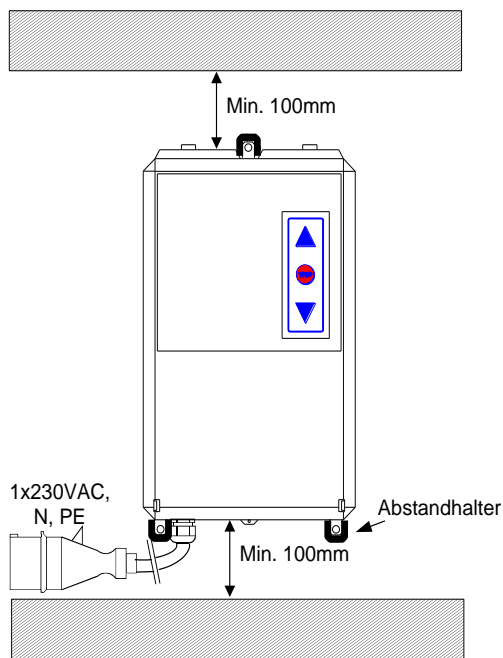


Figure 1: Installation in small housing

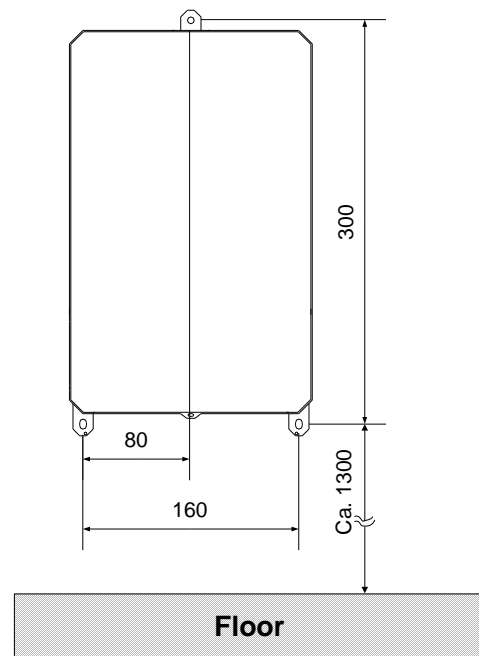


Figure 2: Drilling template small housing

4.1.1 Installation position of the cover

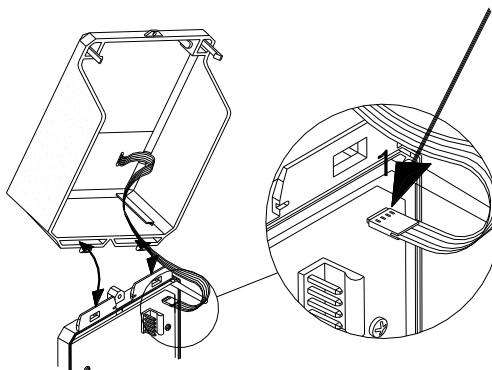


Figure 3: Installation position of the cover

4.2 Additional heat sink for small housing

If the controller is installed in an additional housing so that the cold air supplied to the heat sink is not sufficient, for example, in barrier housings, an additional heat sink must be inserted between the controllers housing and the additional housing to dissipate heat to the outside. This additional heat sink is mounted, for example, on the barrier housing and the controller is mounted above it without the spacers, so that the additional heat sink is clamped between the controller and the cabinet.

The additional heat sink must have the following design:

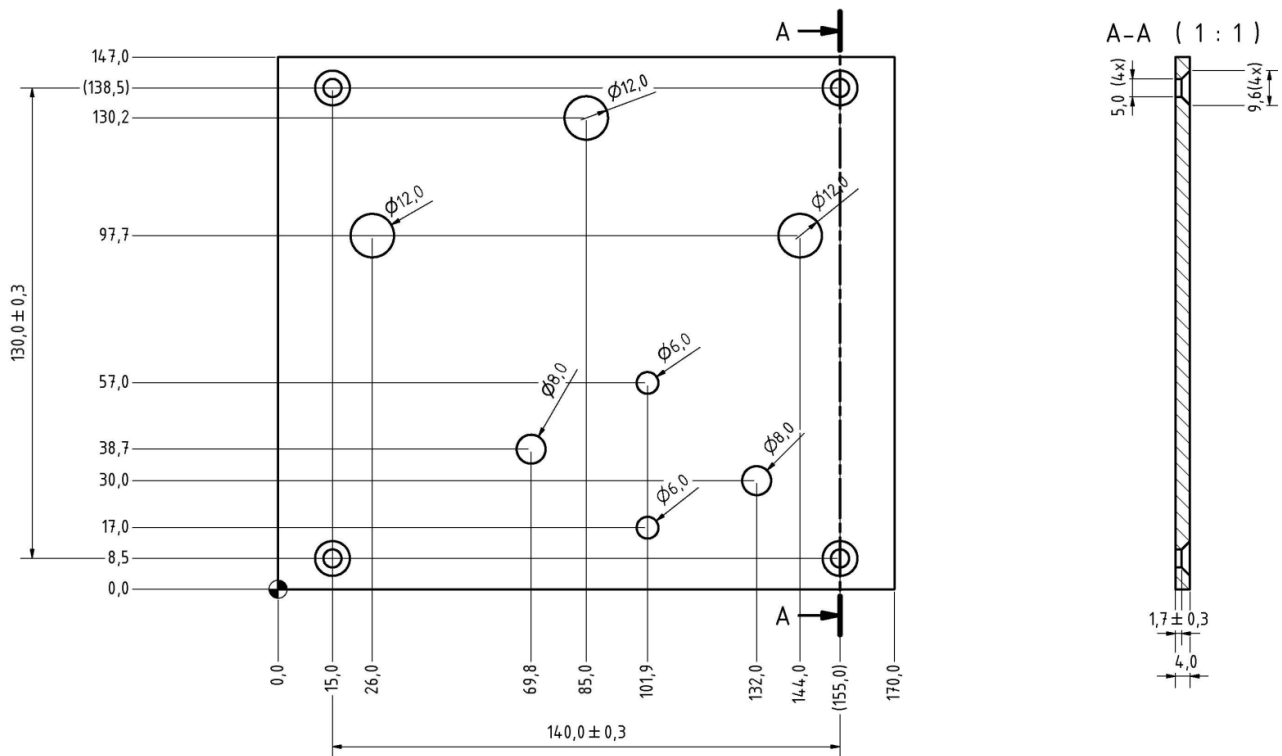


Figure 4: Additional heat sink

The additional heat sink must be bolted to the housing and then controller can be installed:

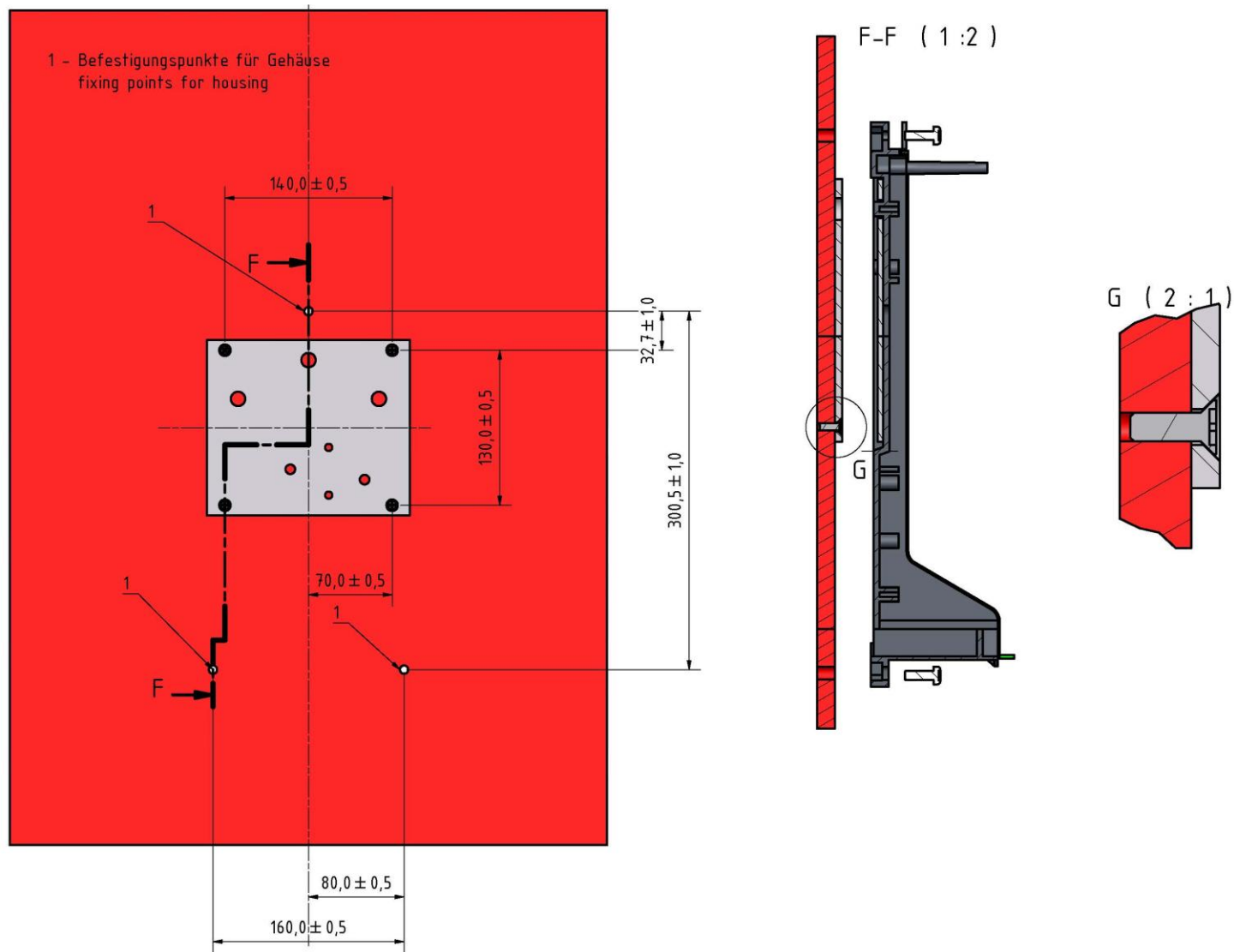
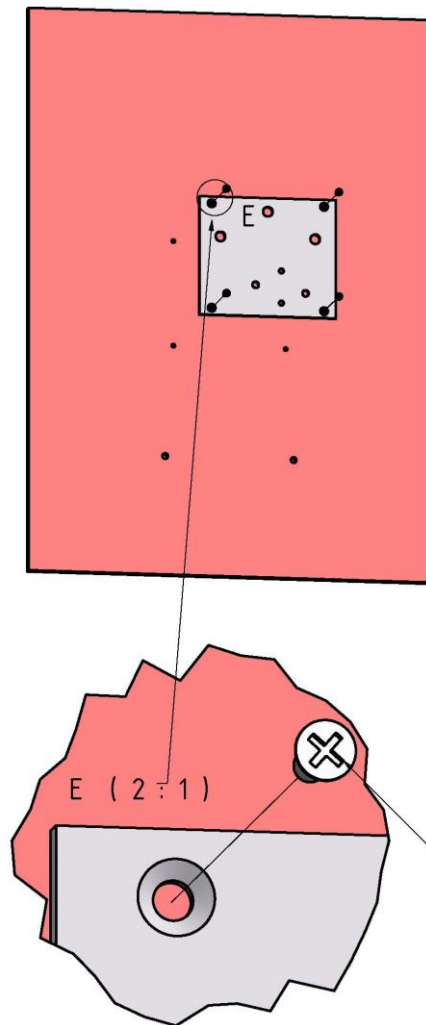


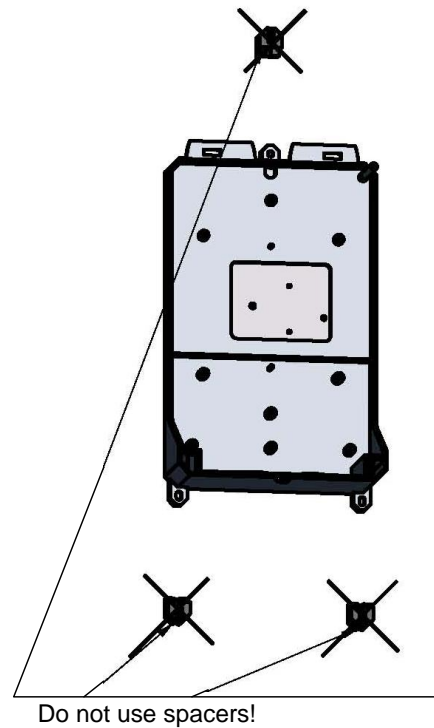
Figure 5: Drilling layout for additional heat sink and controller

The following images show the installation of the heat sink with the controller:

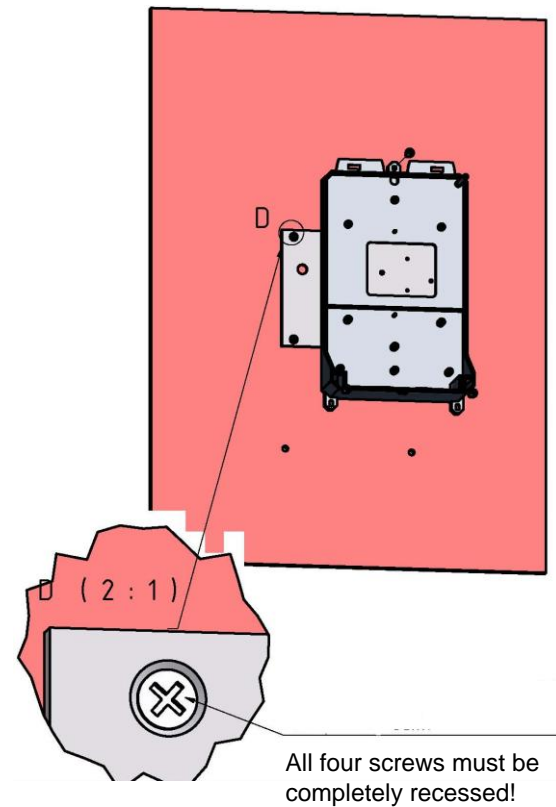
Step 1: install additional heat sink



Step 2: remove the spacer



Step 3: install the controller



4.3 Housing option 2 / large housing

This type of housing is used for controller types TST FUZ2-CGH, TST FUZ2-B, and -LGH.

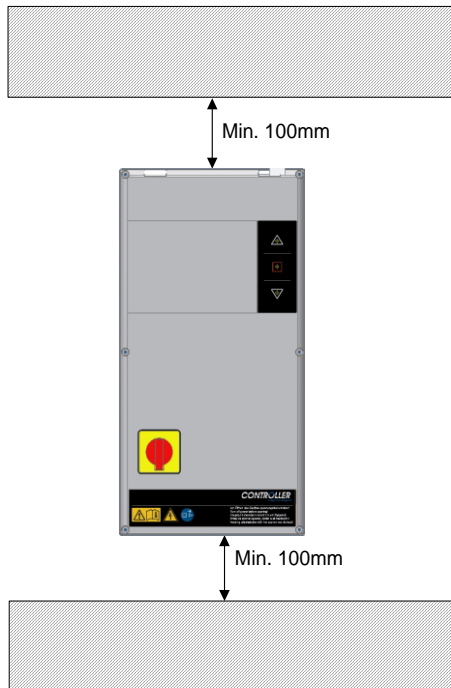


Figure 6: Installation in large housing

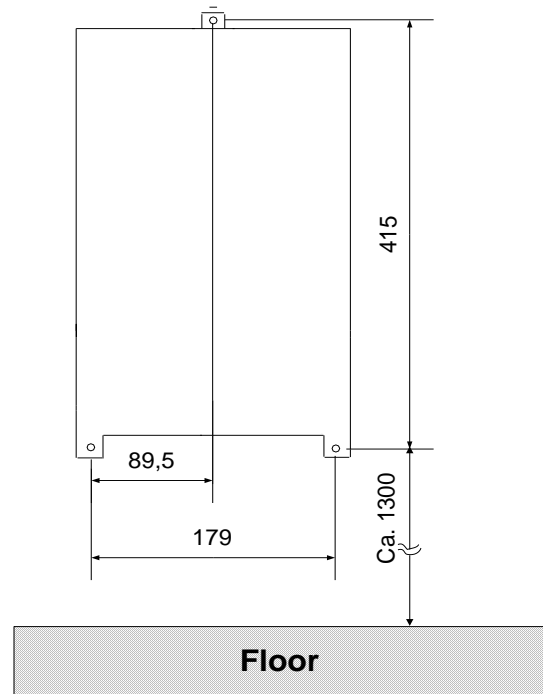


Figure 7: Drilling template large housing

5 Electrical connection

ATTENTION

- Any wiring, testing and maintenance work on an open controller shall only be performed when power has - been turned off. Pay particular attention to the points shown under "Safety information".
- The controller must never be operated while it is open.
- When the controller has been turned off, dangerous voltage levels are still present for up to 5 minutes.
- During the downtime, no isolation exists between the amplifier module and the motor terminal.
- Touching electronic components is dangerous due to residual voltages.
- Never operate the controller while the cover is removed.
- When the installation was completed, check that the system was configured correctly and that the safety system works properly.
- The controller may be opened only if all the poles of the supply voltage have been turned off. It is not permitted to turn on or to operate the controller when it is open.
- Never operate the controller without having connected the protective earth conductor. The absence of a protective earth conductor will result in hazardous voltages on the controllers housing caused by terminal capacitances. The RFI filters integrated into the controller may increase the leakage current up to a max. of 7 mA (see DIN EN 60335-1 section 16.2). Prior to delivery, the manufacturer will test individual units in this respect.
- Hazardous voltages remain stored in the DC-bus capacitors for up to five minutes after power has been turned off. The discharge time until voltages fall below 60 VDC is a maximum of 5 minutes. Touching internal controller components within this discharge time is hazardous.
- A defective switching power supply can considerably increase the discharge time of the DC-bus capacitors before reaching a voltage less than 60VDC. In this case, discharge times of up to 10 minutes may be possible.
- The processor circuit is galvanically connected to the power line. Important: when taking measurements on the processor circuit, do not use test equipment with PE reference to the measuring circuit.
- The controller must never be operated with a damaged membrane keypad or Display window. Damaged keypads and Display windows must be replaced. To prevent damage to the keypad, do not use pointed objects to operate the keys. The keypad is only designed to be operated by human fingers.
- If the potential free contacts of the output relays or other terminals are supplied by an external voltage, i.e. dangerous voltages that are still present after switching off the controller or disconnecting power, you must attach a suitable warning sign to the housing.

ATTENTION

Disconnect all supply circuits before opening the housing for access to the terminals.

- When moving the door in deadman mode, ensure that the operator has an unobstructed view of the door area, since in this mode safety equipment such as safety edge and photo eyes are defeated.
- Parameter settings inclusive the speed as well as all operations of the safety devices must be checked. Parameter settings and insertion of jumpers shall only be performed by properly trained persons.

WARNING

- Before turning on the controller for the first time and after completion of the wiring, check whether all motor connections are tight on the controller and the motor side and whether the motor is correctly wired in star or delta configuration. Loose connections to the motor usually result in damage to the inverter.
- If the 24 V controller voltage is short circuited or overloaded, the switching power supply will not start up even though the intermediate circuit capacitors are charged. The displays remain turned off. The power supply can only be restarted after eliminating the short circuit or the overload condition.
- To fulfill the conditions of the EMC Directives, only shielded and separate motor conductors must be used, with the shield connected on both ends (motor and controller side) and without any additional connections in the line. Maximum cable length: 30 m.
- Fast running plastic foildoor may produce very high electrostatic charges. A discharge of these voltages may damage the controller. Therefore suitable measures must be taken to prevent electrostatic discharge.
- Turning on or operating the controller in the presence of condensation is not permitted. This can result in the destruction of the controller.
- Before turning on the controllers supply for the first time, ensure that the detector/sensor cards (plug-in modules) have been inserted in the correct locations. Incorrect insertion of the cards can result in damage to the controller, likewise the installation of non-approved third-party equipment.
- Connect connection terminals before connecting to the plug connectors! Only thus is it possible to ensure a safe contact of the connection terminals to the plug connectors.

- Maximum connection diameters for the terminals on printed circuit boards:
- Recheck all wiring connections before turning the controller on. Incorrect connections may damage the unit.

	single wire (rigid)	fine wire (with/without wire end ferrule)	Max. tightening torque [NM]
motor terminals	2.5	2.5	0.5
Line supplies	2.5	1.5	0.5
screw terminals (catch 5 mm)	2.5	1.5	0.5
plug in terminals (catch 5 mm)	1.5	1.0	0.4
plug in terminals (catch 3.5 mm)	1.5	1.0	0.25

5.1 Power supply voltage without main switch

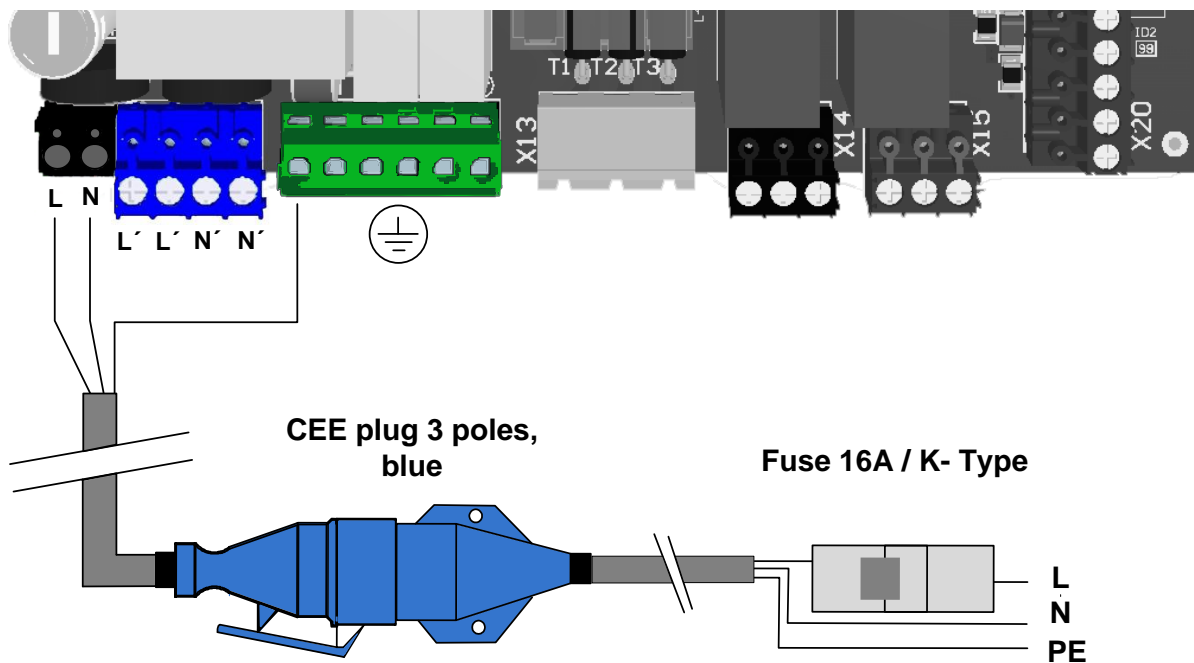


Figure 8: Connecting the power cable



The power plug must be visible and accessible from the control system.

5.3 Motor and brake

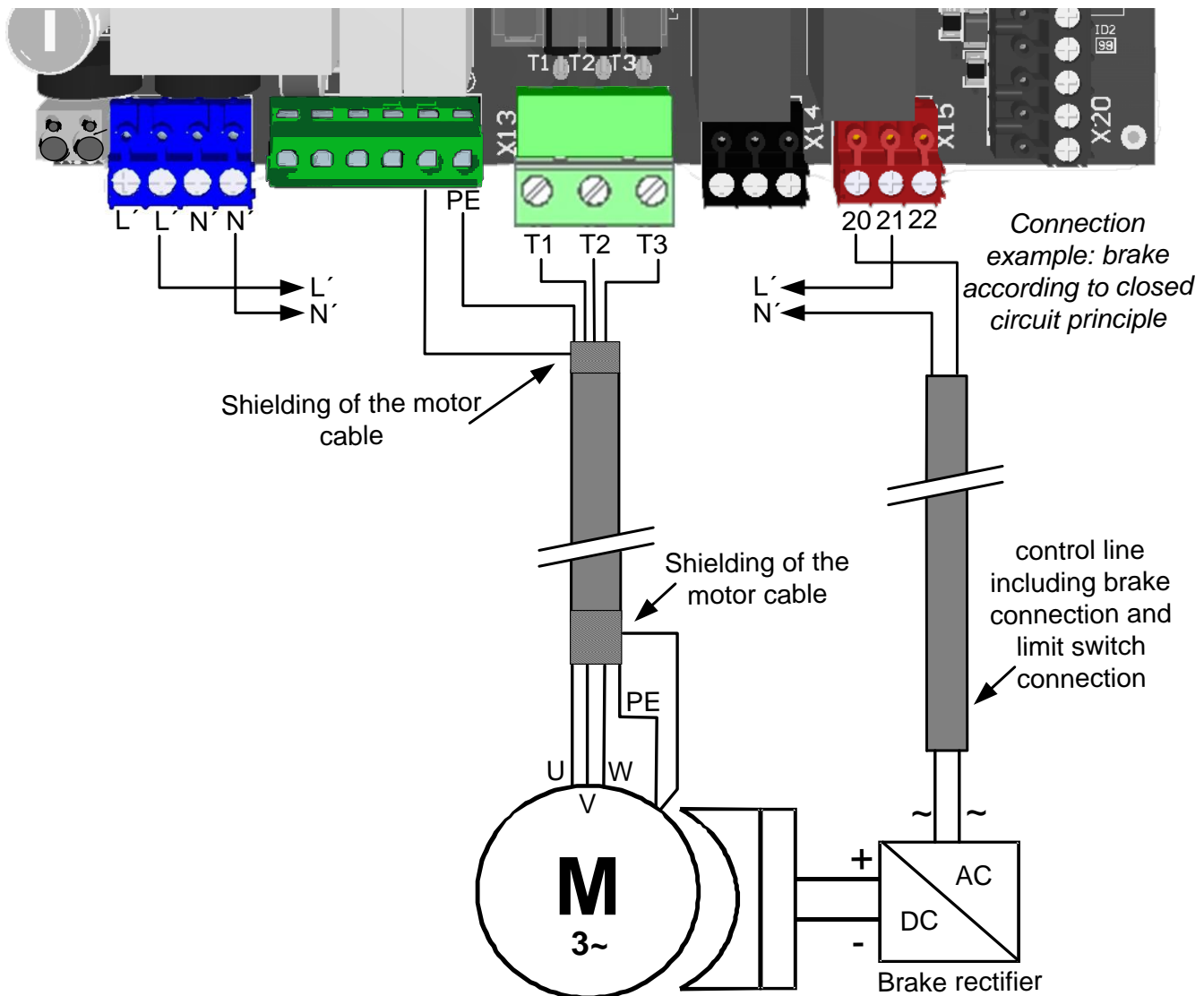


Figure 10: Motor connection

Use a shielded motor cable in order to guarantee error-free operation of the controller. In addition, no other conductors except the motor connection may be included in this line.



In the case of drive units with an electronic brake, ensure that the brake is equipped with adequate suppression. We recommend the use of RC-elements for interference suppression purposes.

For the relay K2 to work as a brake relay, set parameter P.702 = 3201.

5.4 Safety edge on the integrated evaluation

Various types of safety edges can be connected, for example:

- Electrical safety edge with 1.2 kΩ or 8.2 kΩ terminating resistor.
- Dynamical optical system



If one of these types of safety edges is connected when the door control system is switched on it will be recognized automatically.



If no safety edge is connected, automatic closing of the door is not possible.

Use of additional types of safety edges is possible. Please contact the door manufacturer in this respect.

5.4.1 Optical safety edge

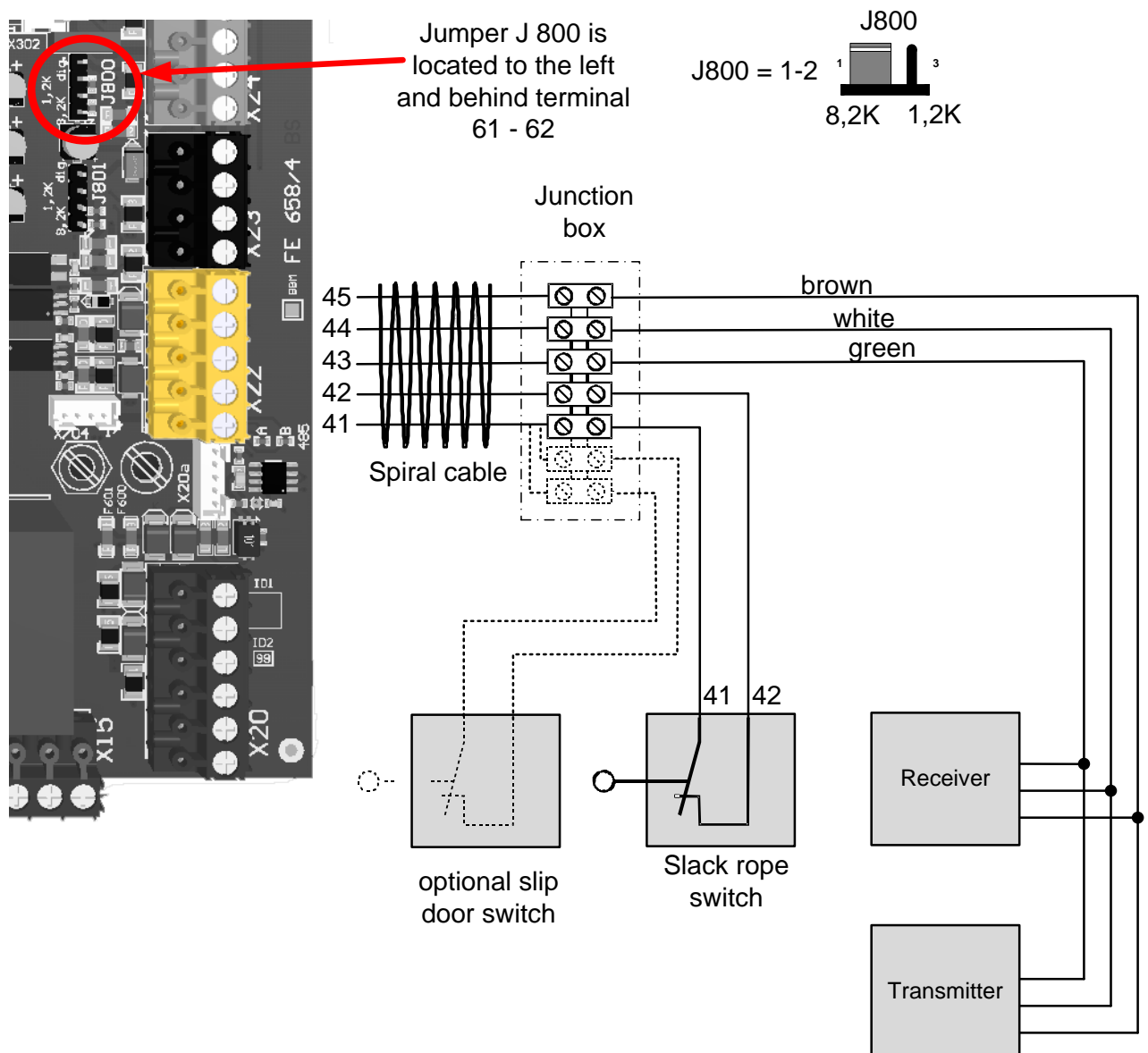


Figure 11: Connection of an optical safety edge

5.4.2 Electrical resistance safety edge

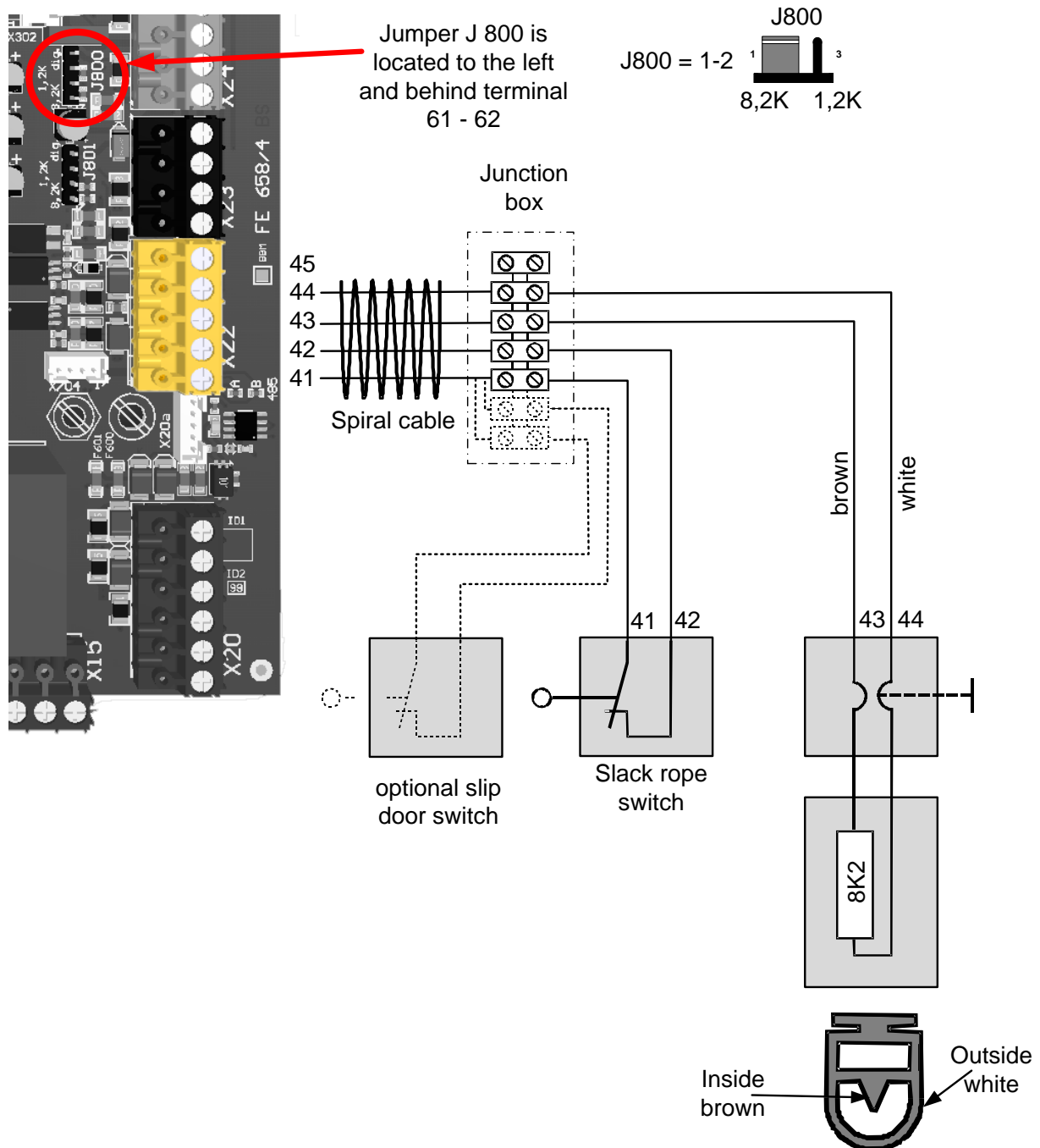


Figure 12: Connecting an electrical resistance - safety edge

5.5 Safety edge at the 2nd Integrated evaluation (input 10)



The evaluation / input is not available for variant TST FUZ2-A!

Various types of safety edges can be connected, for example:

- Dynamical optical system
- Electrical safety edge with 1.2 k Ω or 8.2 k Ω terminating resistor.
- Digital input

Use of additional types of safety edges is possible. Please contact the door manufacturer in this respect.

5.5.1 Optical safety edge

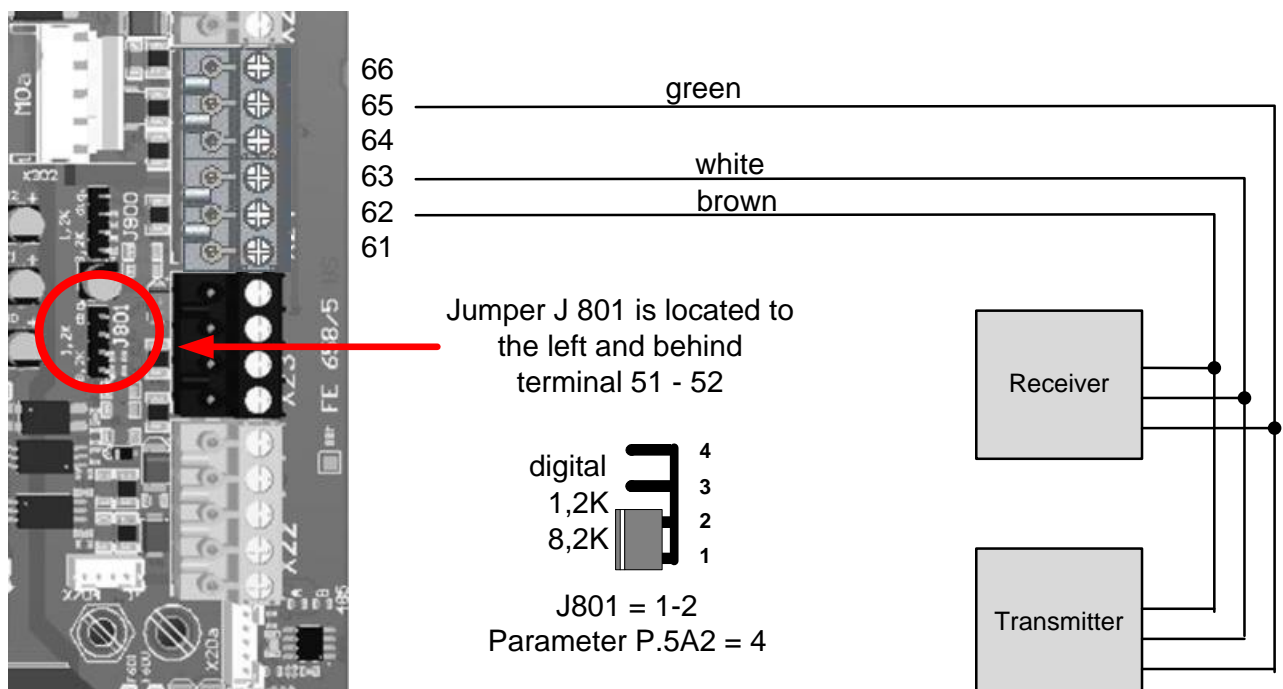


Figure 13: Connection of an optical safety edge

5.5.2 Electrical resistance safety edge

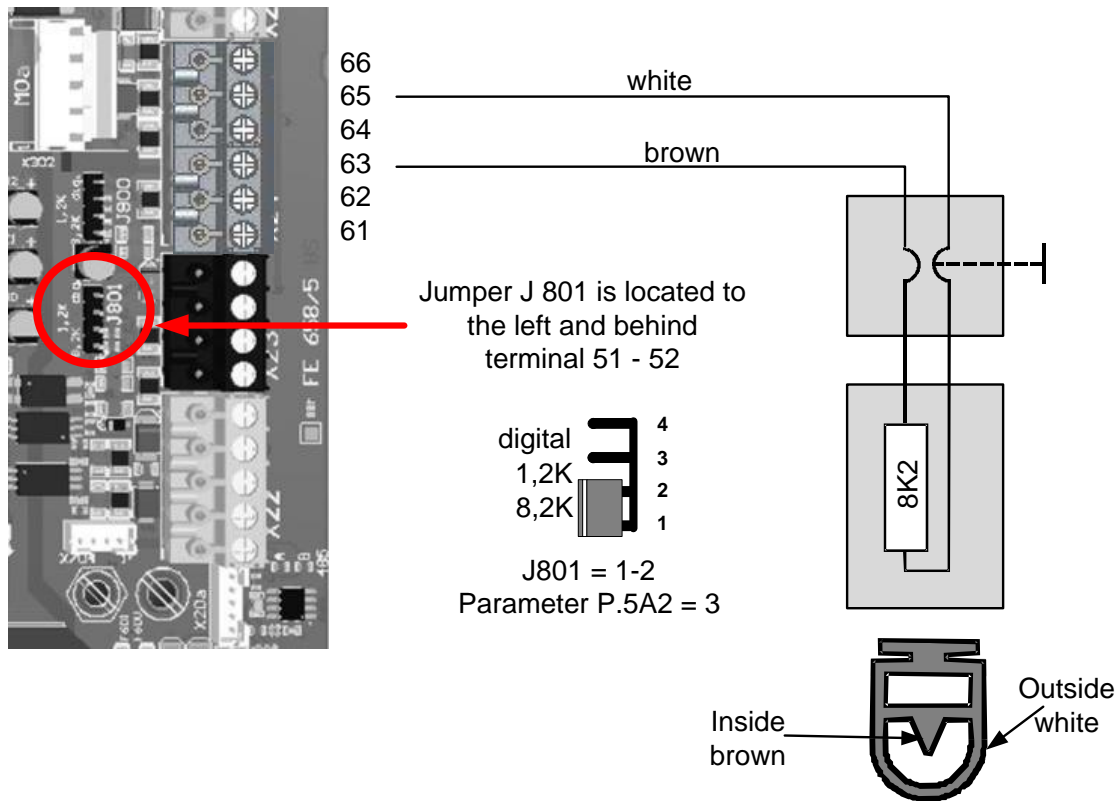


Figure 14: Connecting an electrical resistance - safety edge

5.5.3 Digital input

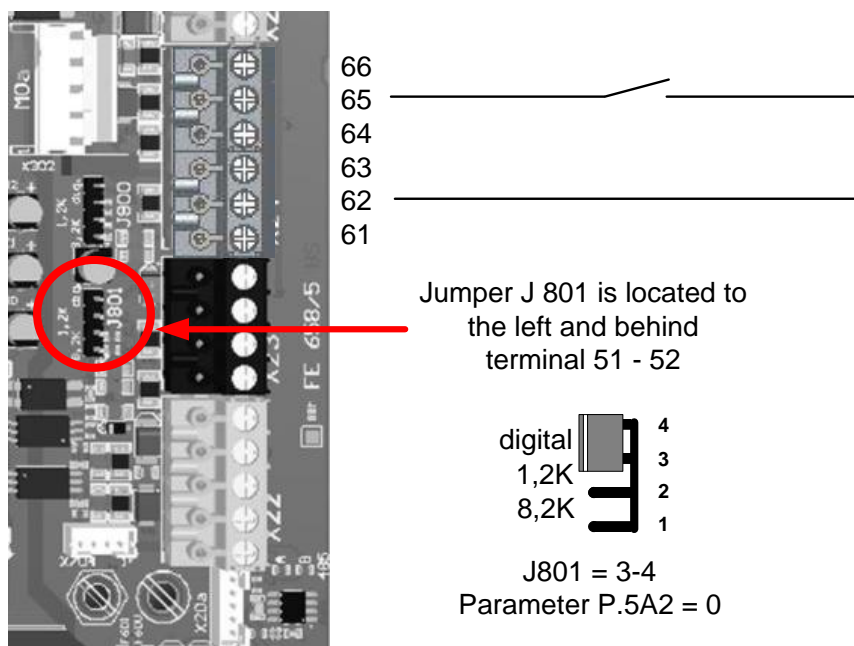


Figure 15: Connecting an electrical resistance - safety edge

5.6.2 Connection of the TST LGB

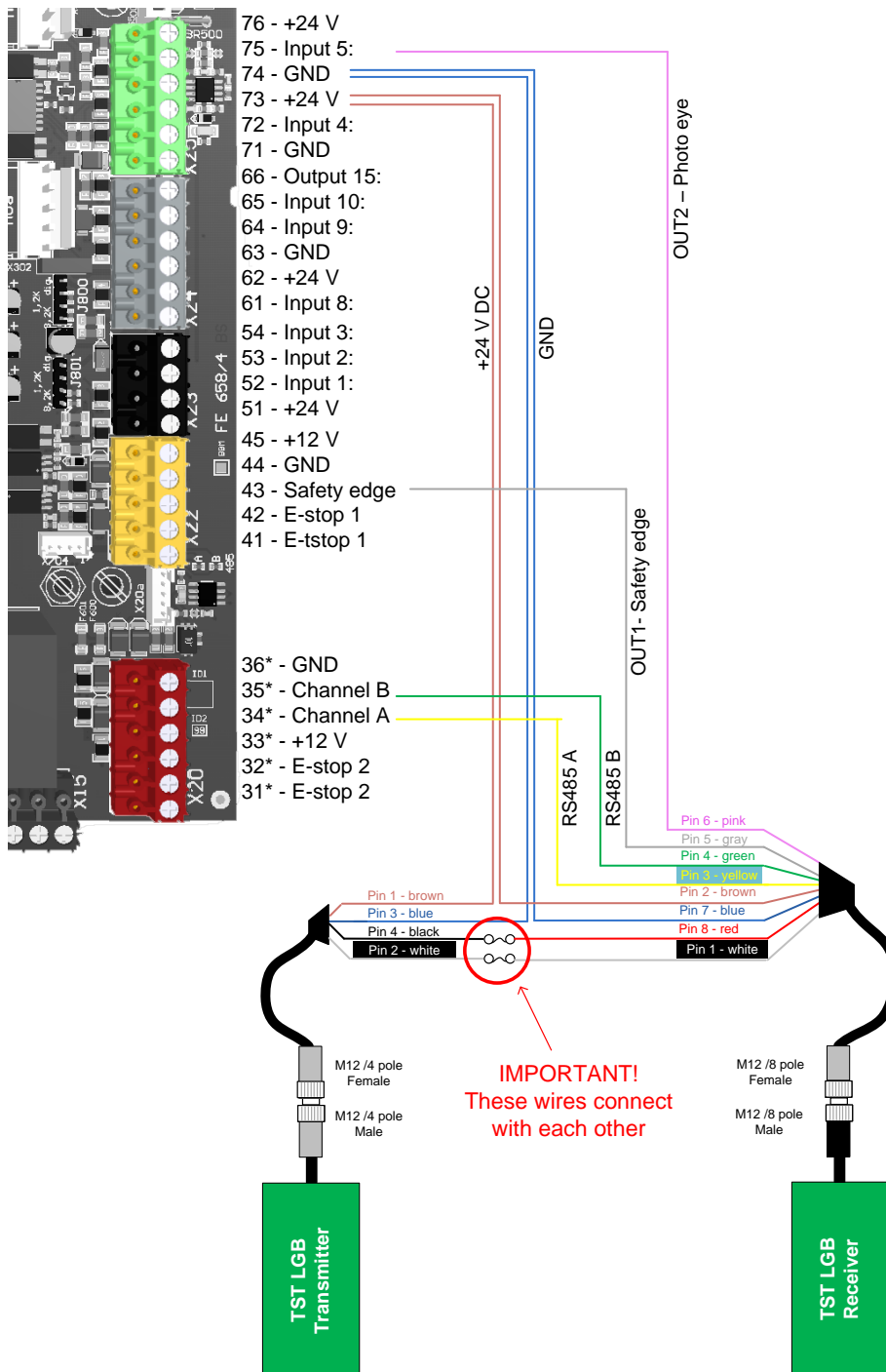


Figure 17: Connection of the TST LGB

5.7 Limit switchconnection

Different limit switch systems can be used with the TST FUZ2 door control system. The default setting uses an absolute encoder as the limit switch. In addition, mechanical limit switches may be use.

5.7.1 Absolute encoder TST PE or TST PE FSB with WICAB system

Absolute encoder TST PE is a single-turn encoder. The driving shaft must not execute more than a single revolution over the entire path of the door.

Absolute encoder TST PE FSB is equipped with the WICAB radio system. The WICAB system can be employed to replace the spiral cable with a wireless link. For this purpose, a mobile unit TST FSBM or TST FSAM must be mounted on the door leaf.

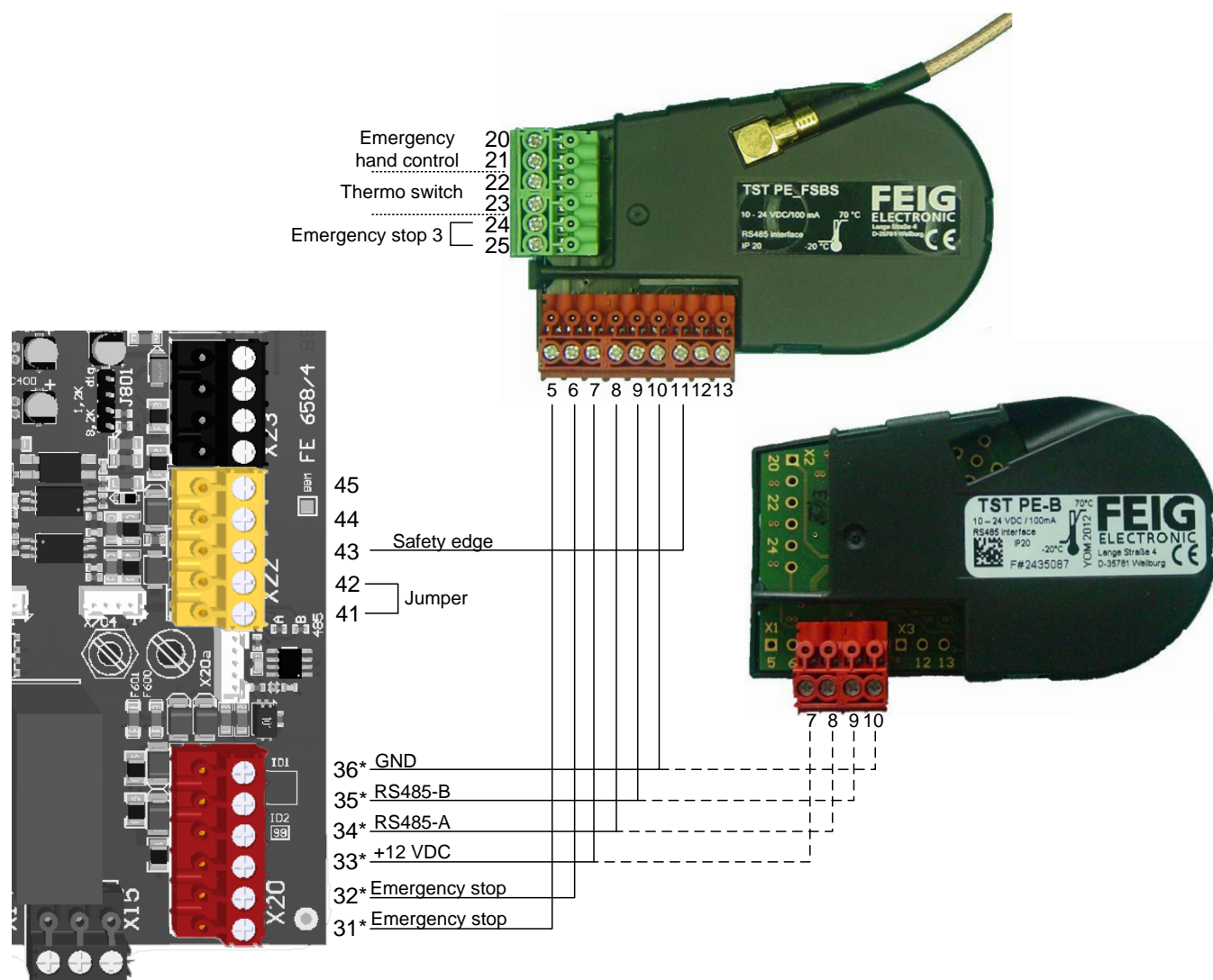


Figure 18: Absolute encoder TST PE / TST PE FSB

5.7.2 Absolute encoder TST PD

Absolute encoder TST PD is a multi-turn encoder. Due to a selectable transmission ratio, this encoder can be used for both very fast (e.g. motor shaft) as well as very slow shafts (e.g. door shaft). The driving shaft may execute more than a single revolution.

This encoder may also be equipped with the WICAB radio system to transfer the status of the safety edge without a spiral cable. For this purpose, the stationary unit TST PD FSAS and the mobile unit TST FSAM or TST FSBM are required.

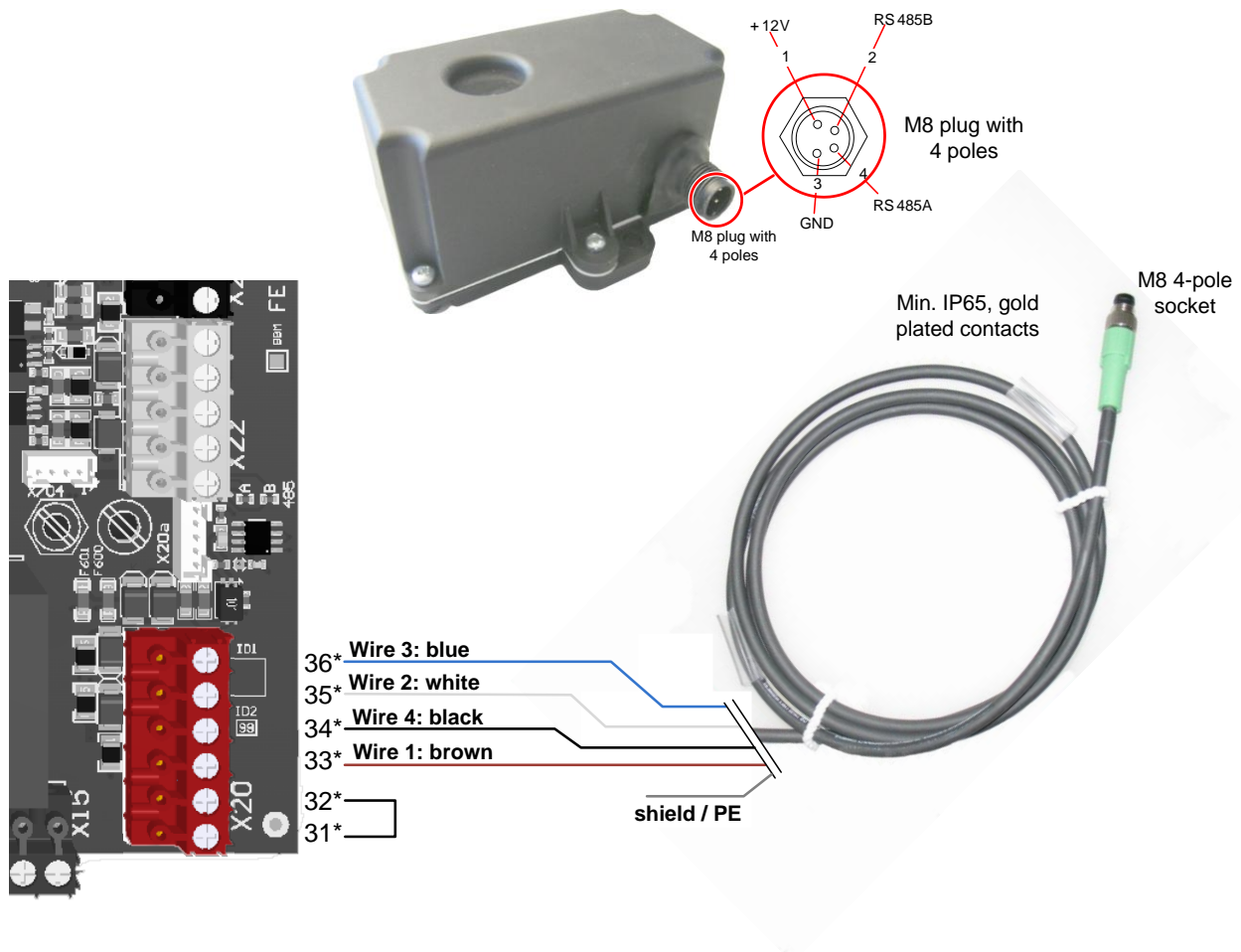


Figure 19: Absolute encoder TST PD

5.7.3 Absolute encoder DES

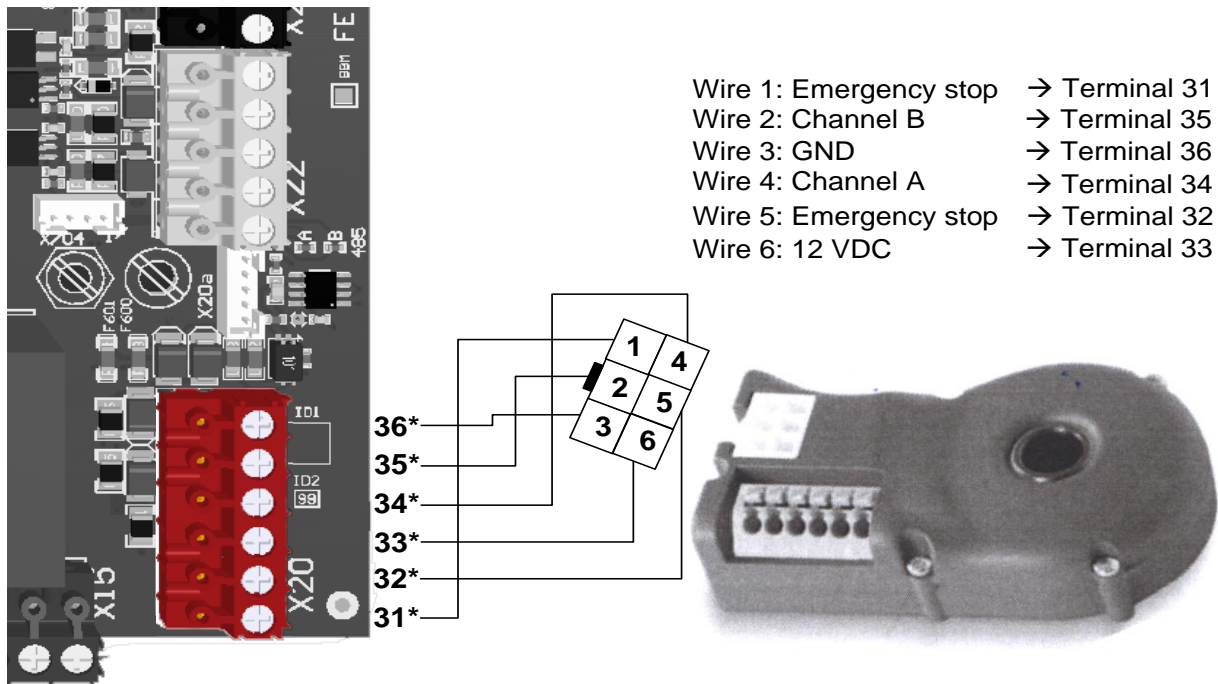
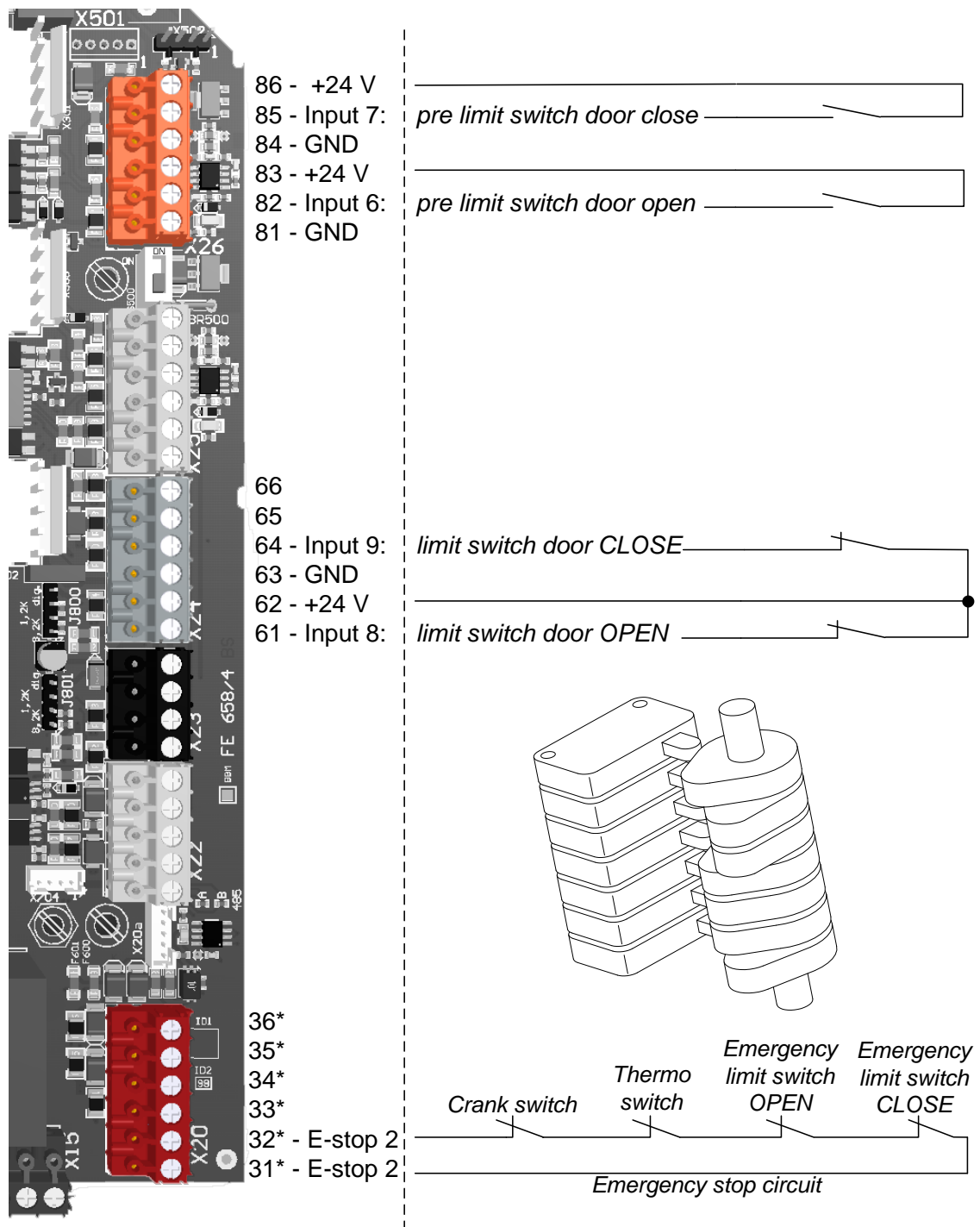


Figure 20: Connection of absolute encoder DES

5.7.4 Mechanical limit switches



Figur 21: Connecting cam switches



Alternately, the pre-limit switches can also be connected as normally closed contacts.

5.8 Photo eye

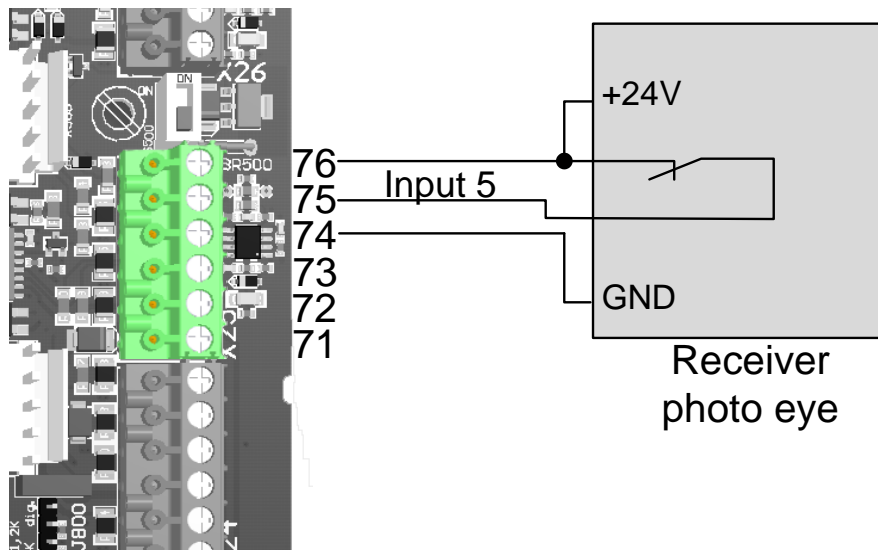


Figure 22: Photo eye connection

5.9 External triggering devices

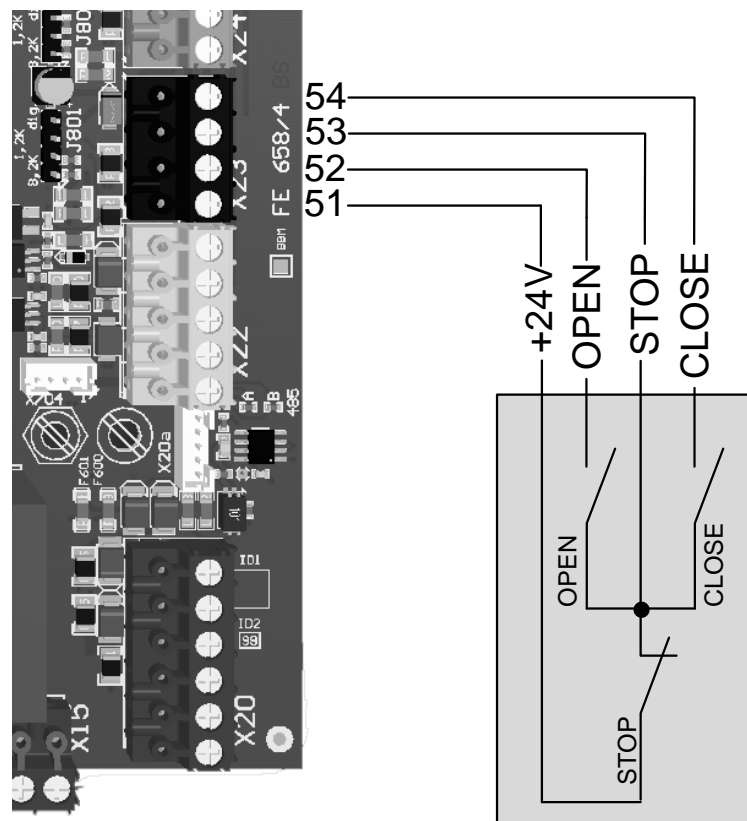


Figure 23: External triggering devices

5.10 Traffic light connection

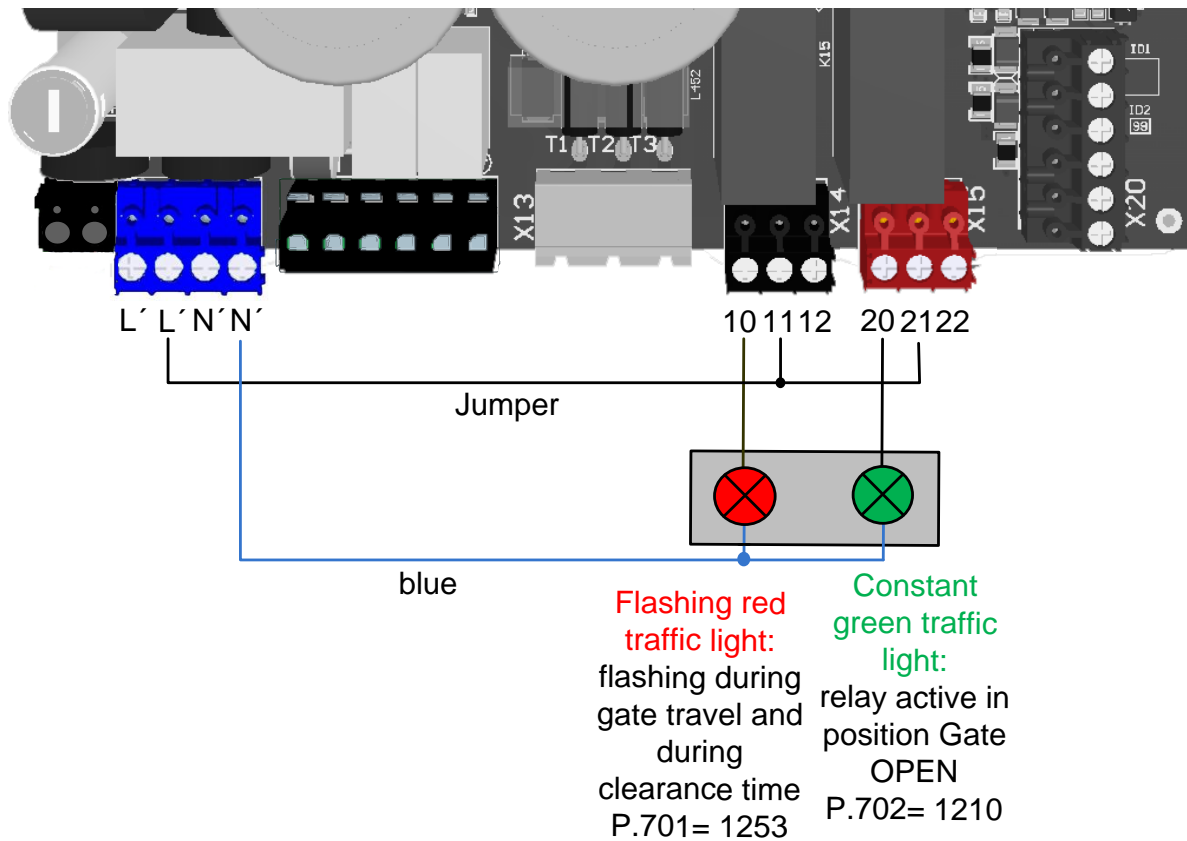


Figure 24: Traffic light connection



When a motor brake is being used, relay K2 is already occupied and it can not be used to control a traffic light.

5.11 Overview of outputs

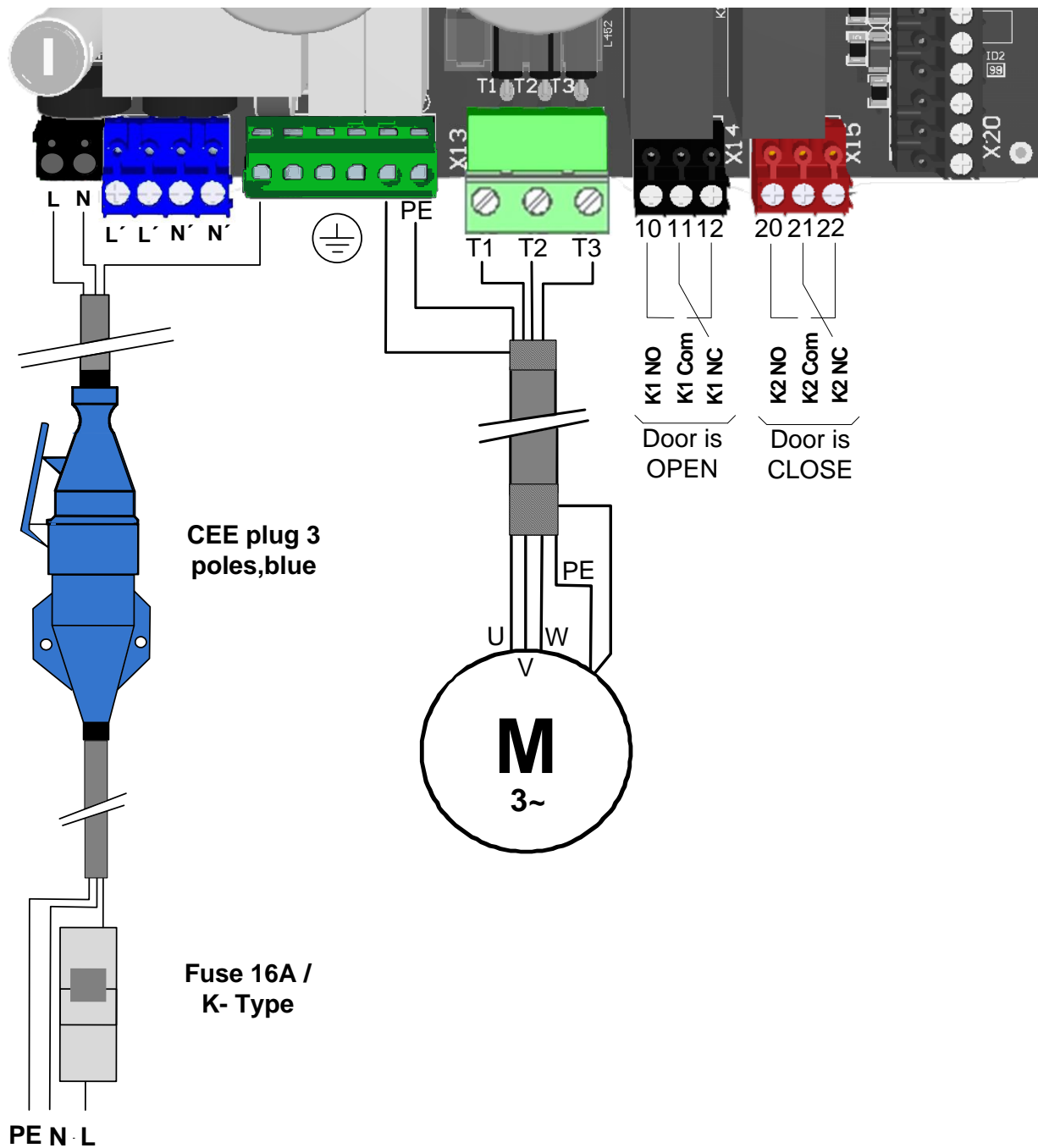


Figure 25: Overview of outputs



Contrary to the mentioned standard settings, the relay function is selectable

5.12 Overview of inputs

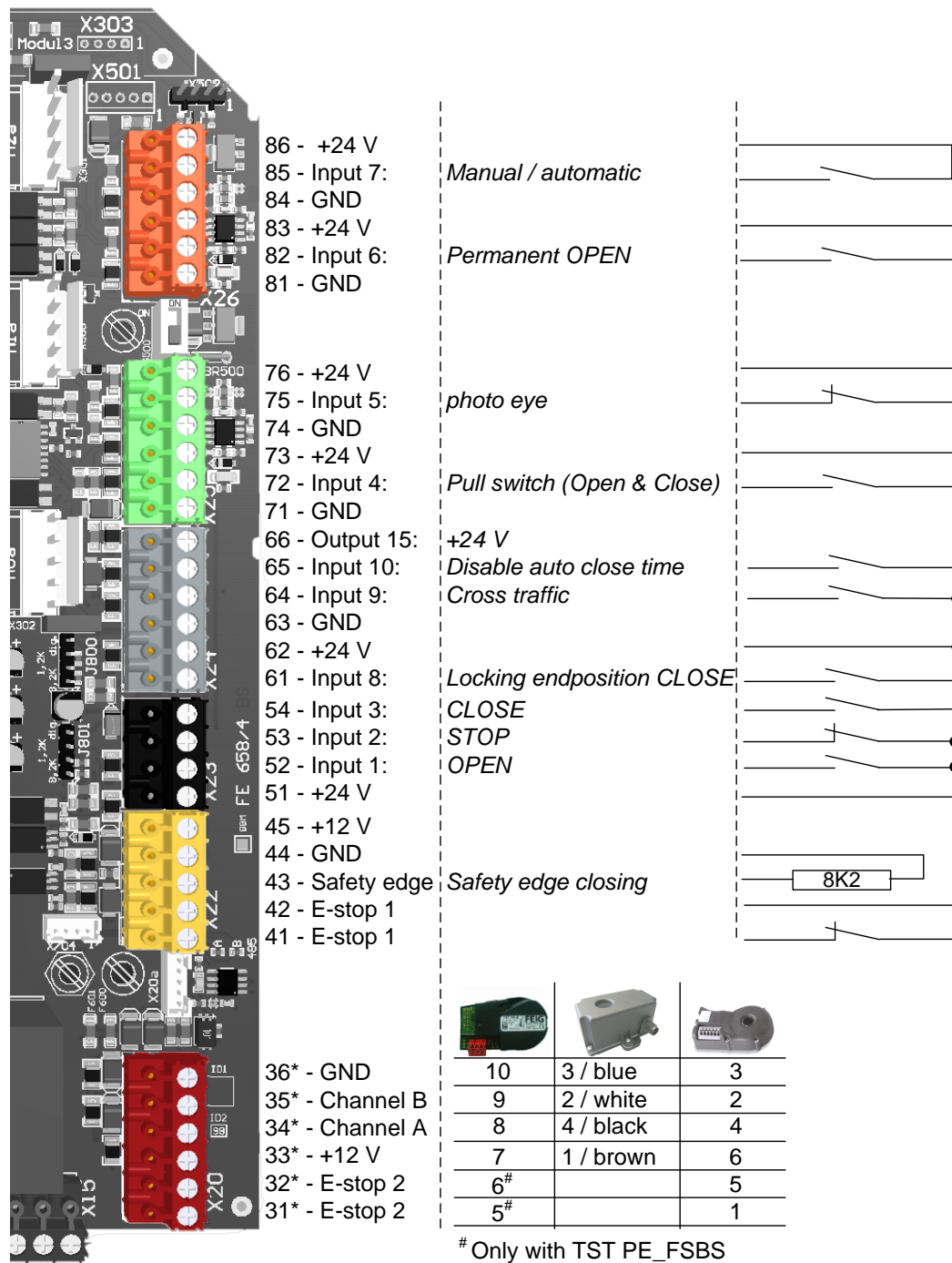


Figure 26: Overview of inputs



On the control option –B, input 10 is used as a second safety edge monitor.
For the connection of mech. limit switches, please refer to section 5.7.4 Mechanical limit switches.

6 Optional plug-in and expansion cards

Several slots are available to expand the operation of the controller with optional plug-in and expansion cards.

6.1 Wireless receiver TST SFFE

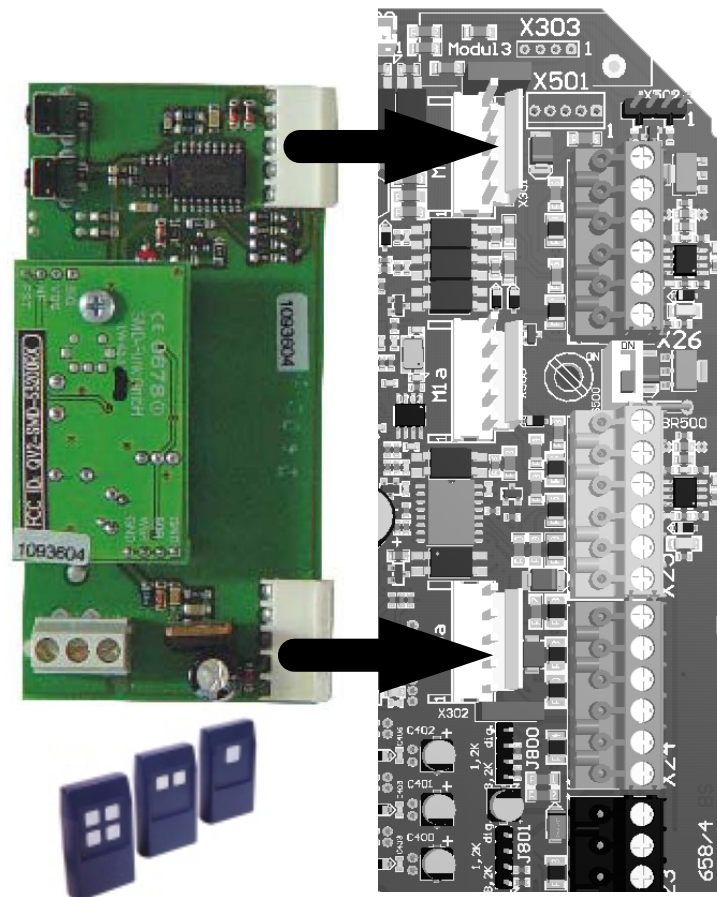


Figure 27: Wireless plug-in receiver



To enable the slot for the wireless receiver, parameter P.802 must be set to 0202.

6.2 Induction loop detector TST Suvek

The Induction loop monitor is available in versions TST SUVEK-1 and TST SUVEK-2. Depending on the type, 1 or 2 loops may be monitored.

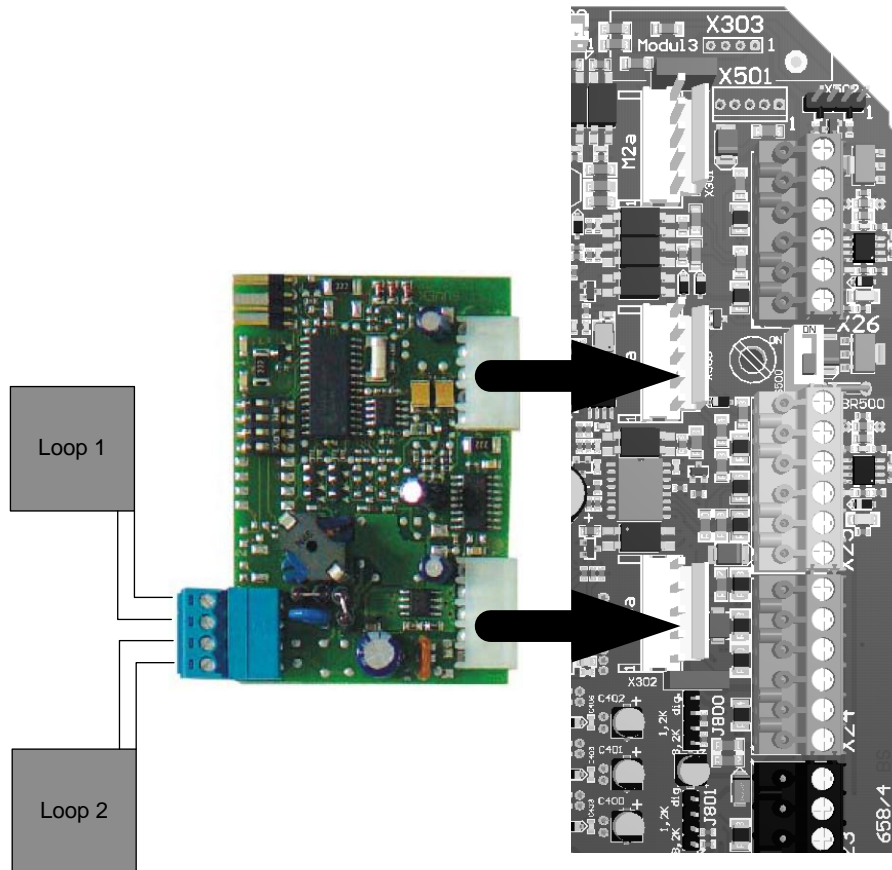


Figure 28: Detector card



To activate the slot for the detector, parameter P.802 must be set to 0302.
It is not possible to operate detector cards in version –A

6.3 Safety edge monitor TST SURA

The Safety edge monitor is available in version TST SURA-1 and TST SURA-6.
Depending on the type, 1 or 6 safety edge may be monitored.

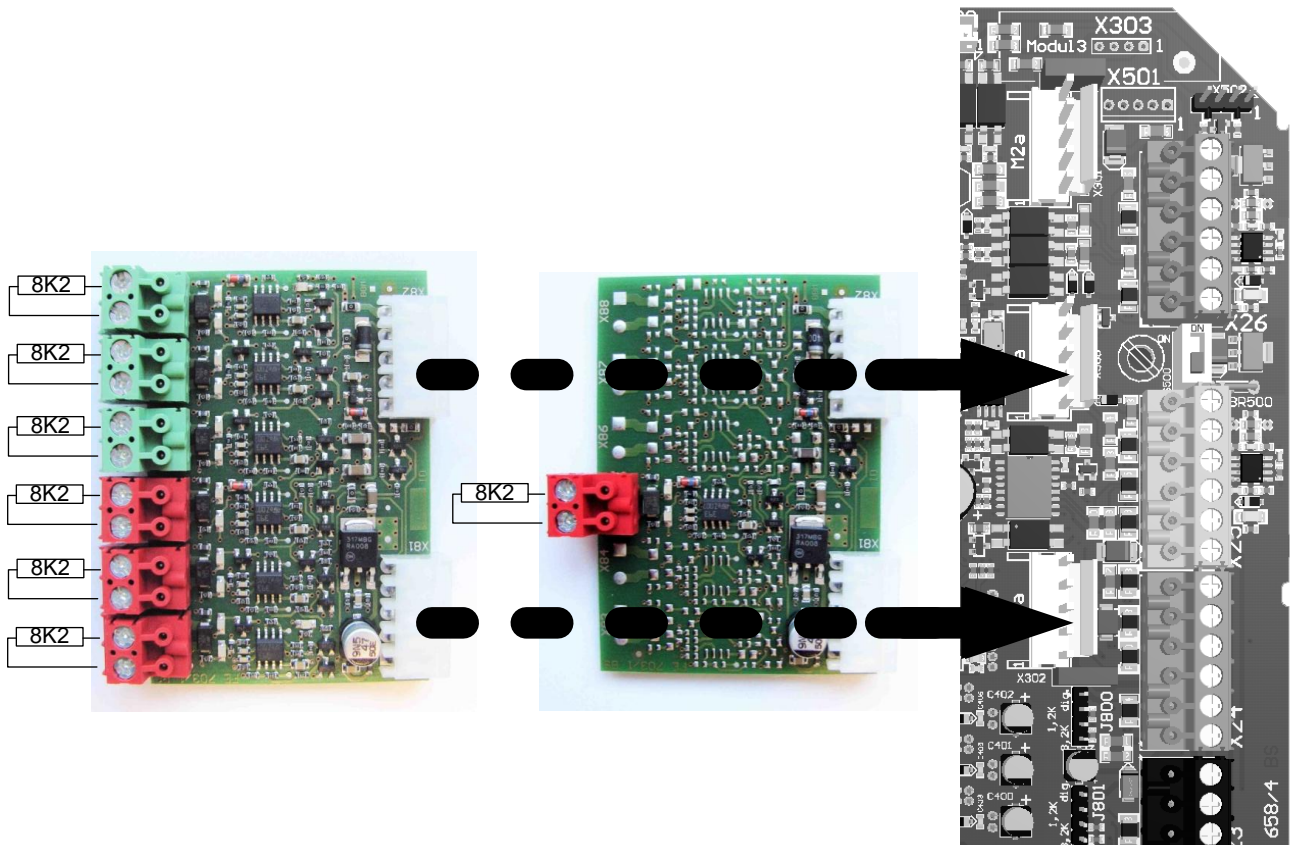


Figure 29: Safety edge monitor



To activate the slot for the safety edge monitor, parameter P.802 must be set to 0101 for TST SURA-1 or 0106 for TST SURA-6.
The operation of safety edge monitors is not possible in version –A

6.4 Expansion card RFUxK

Expansion card TST RFUxK can optionally be plugged in and has an additional 6 inputs and 6 relay outputs and one digital output, with freely programmable operation. In addition, a 2-channel inductive loop detector and an annual timer switch as well as an additional RS-485 interface are included, e.g. for connection to a partner controller

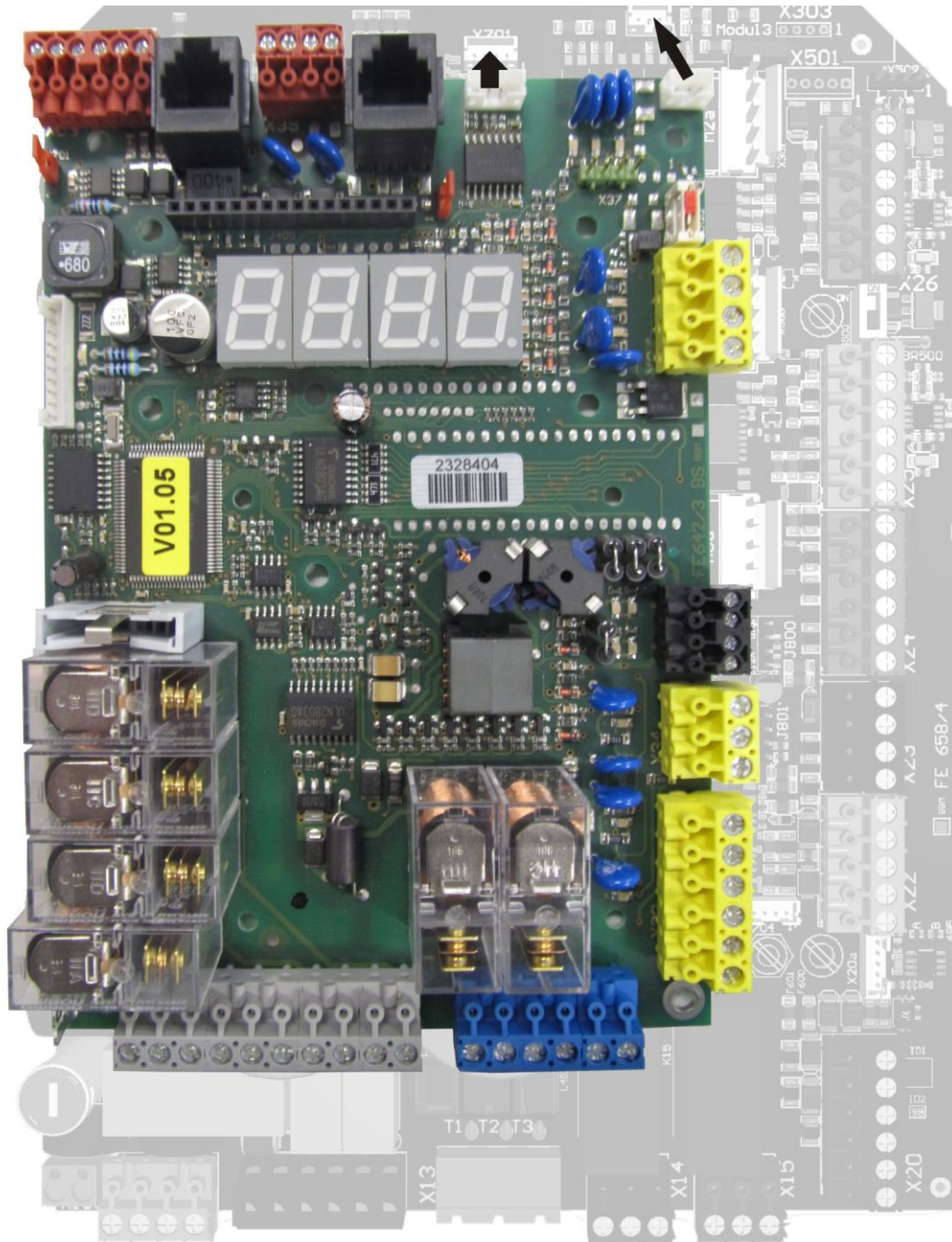


Figure 30: TST RFUxK expansion card



Activate the expansion card by setting the parameter P.800 to 5.
The card can not be operated in the versions: -B, -CGH, -CXGH and -LGH.

6.5 Interface card TST RFUxFCOM

Optionally, the interface card TST RFUxFCOM provides an RS-485 and a CAN interface. With these, for example, it is possible to establish connections with partner controller or to a remote TST RFUxK board.

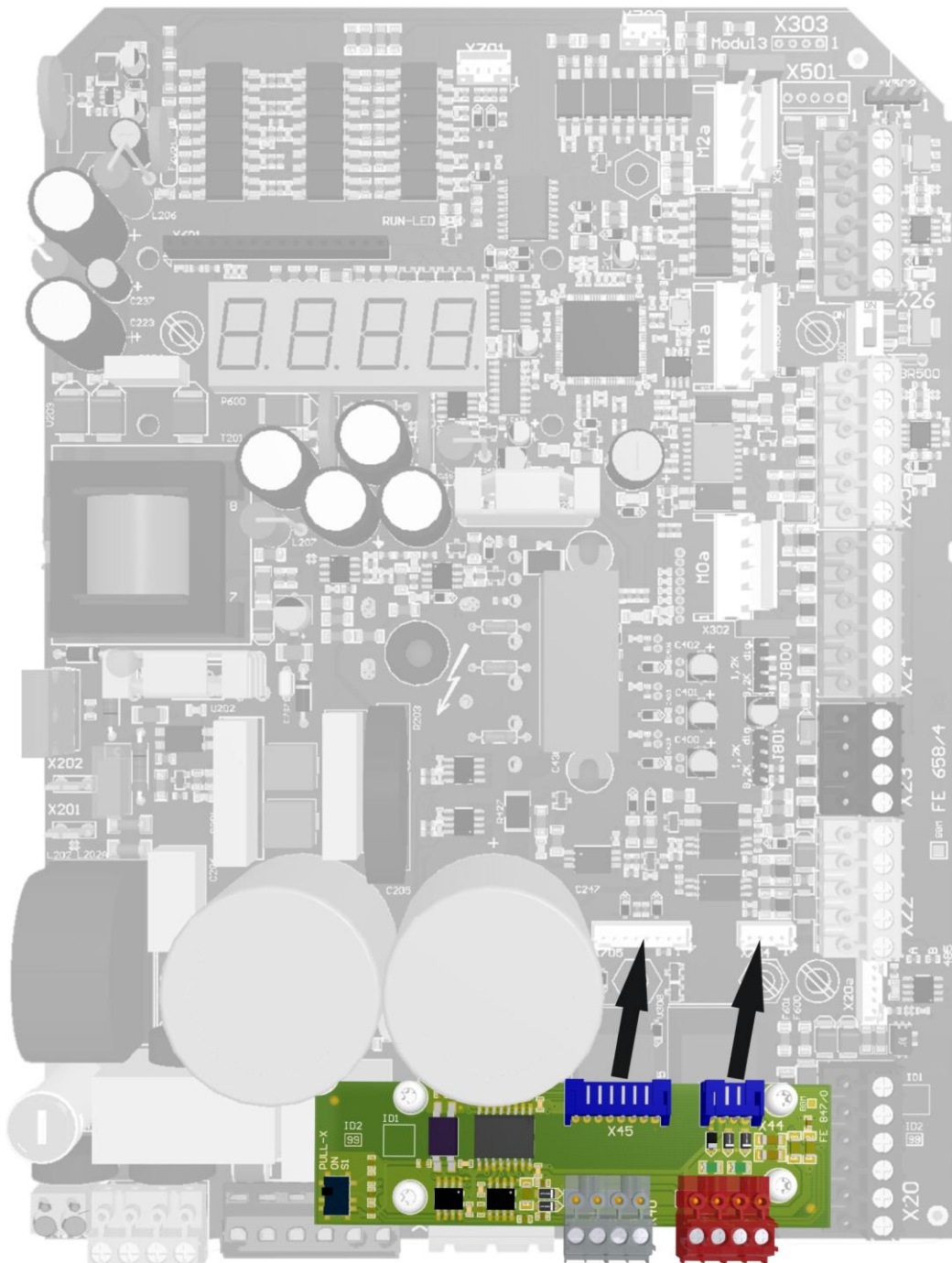


Figure 31: Interface card TST RFUxFCOM



The interface card cannot be used in version –A

6.6 Auxiliary relay TST SRA

Auxiliary relay TST SRA can optionally be attached to the base M2a of the slot for the wireless module, providing a potential-free changeover contact. The function of the associated output 2A may be adjusted by the parameter P.D0A.

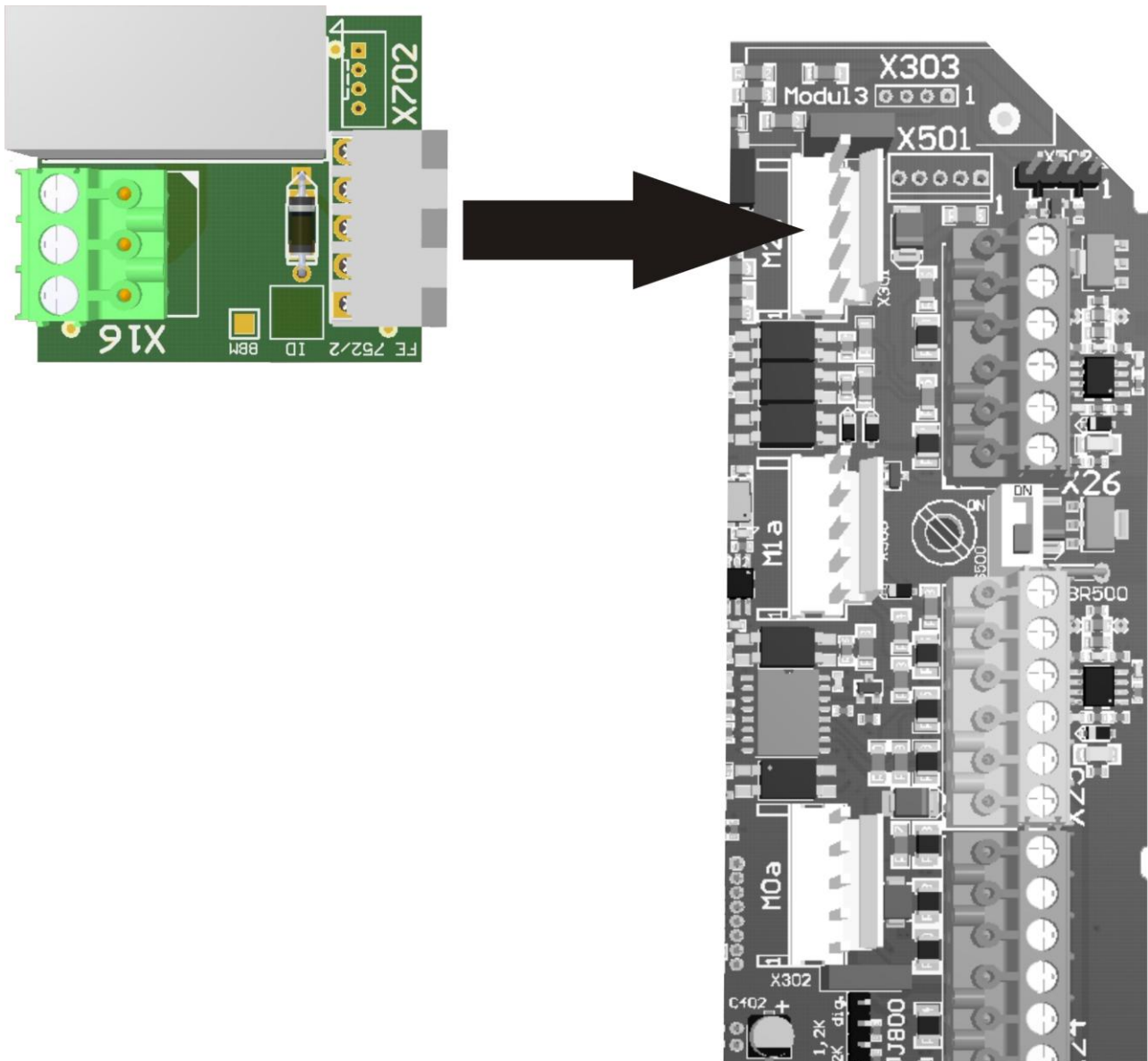




Figure 32: Auxiliary relay TST SRA



The additional relay TST SRA cannot be used in version –A.

7 General operating instructions to set parameters

7.1 Open the parameter operation mode

1.  Turn off the door controller and wait until the display has been completely extinguished.
2.  Open the cover of the enclosure and switch the DIP switch S500 (see illustration) to ON. The service mode is activated and you can close the cover.

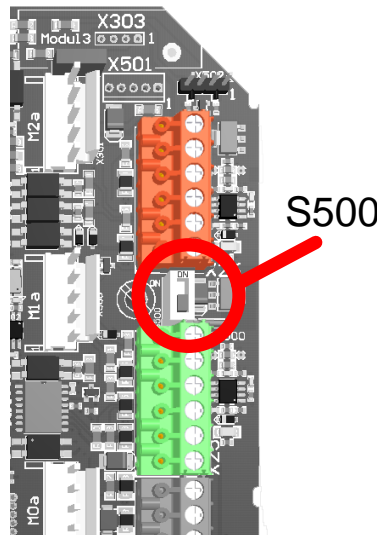





Figure 34: DIP switch position



The service mode is automatically reset after approx. 1 hour. In order to reach service mode again, the controller must be turned off for a short period and then turned on again or a reset must be performed.

3.  Close the cover of the enclosure and turn on the controller.
4.  keep these pressed simultaneously to reach the parameter selection. (either appears **1: Clear text display** or **2: 7-Segmentdisplay**)
5.  Use the arrow keys to select the required parameter.



ATTENTION

Not all the parameters are visible or may be changed immediately; this always depends on the password and the type of position set.

P: door cycles	P .000
000#	1234Zyk



P: Offenhalt1	P .010
010=	10 s

7.2 Editing a selected parameter

1.  By briefly pressing the  STOP key on the membrane keypad, the cursor moves to the right to the stored value (the parameter is opened) or the preset value is displayed.

P: Offenhalt1 010=	10 s	P .010
-----------------------	------	--------



P: Offenhalt1 010=	10✓s	10
-----------------------	------	----

2.   The parameter value is increased with the OPEN button and reduced with the CLOSE button.




If the value has not yet been saved, a question mark is displayed after the number or the decimal point flashes.



P: Offenhalt1 010=	9?s	q*
-----------------------	-----	----

3.  If the  STOP key is only pressed briefly, the set value is not saved and the value is changed to the originally stored value, i.e. the original value is displayed.

P: Offenhalt1 010=	10✓s	10
-----------------------	------	----

If you keep the  STOP key pressed until the check mark is displayed or the decimal point no longer flashes, the changed value is saved.

P: Offenhalt1 010=	9✓s	q
-----------------------	-----	---

4.  If you now press the  STOP key briefly, you change to the display of the parameter name or the cursor jumps back to the parametrization.

P: Offenhalt1 010=	9 s	P .010
-----------------------	-----	--------

7.3 Exit parameter operation mode



Keep the STOP button pressed for approx. 3 seconds in order to leave the parameter mode and change to the door mode. The door operation is active when the display shows for example:

FEIG ELECTRONIC xxxx Cycles	-* E u -
--------------------------------	----------

7.4 Execute a reset



press simultaneously for approx. 3. hold for seconds.

7.5 Entry into the extended parameter configuration mode

In order to reach the extended parametrization mode, a password must be entered in advance. The following parameter must be set for this:

P.999 = 2 (extended commissioning mode)

P: Password 999= 0001 #	P. 999
----------------------------	--------

P: Password 999= 0001✓#	0001
----------------------------	------

P: Password 999= 0002?#	0*0*0 *2*
----------------------------	--------------

P: Password 999= 0002✓#	P. 999
----------------------------	--------

8 Basic settings

To put the controller into operation, please follow the steps outlined in these instructions.

8.1 Automatic query of basic data

If the controller is not already preconfigured by the door manufacturer, the following parameters are queried automatically:



The DIP switch must have been turned on (see position DIP-switch figure Figure 34: DIP switch position) so that the controller can query parameters automatically.

If DIP switch is not turned on and the basic parameters not set, error code F.090 is displayed.



The controller uses indicator "-1" or "-" in the display as a flag that the acquisition of this parameter must be queried.

The basic data does not require changes when they were previously retrieved and set automatically.

For operating the controller, see chapter 7 General operating instructions to set parameters.

- **Positioning system P.205** The limit switch system in use must be set using Parameter P.205.

P.205: 0000 = Mechanical limit switches Version 1 (Figur 21: Connecting cam switches)

P.205: 0001 = Mechanical limit switches Version 2 (limit switches and pre-limit switches are normally closed)

P.205: 0300 = Absolute encoder DES-A (GfA)

P.205: 0700 = Absolute encoder DES-B (Kostal)

P.205: 0800 = Absolute encoder TST PD / TST PE (FEIG)

P.205: 0900 = Timer limit switches

- Motor data P.100 – P.103**

The door controller uses the following parameter setting to learn about the type of motor being used. Read the data from the nameplate and enter them into the corresponding parameters.

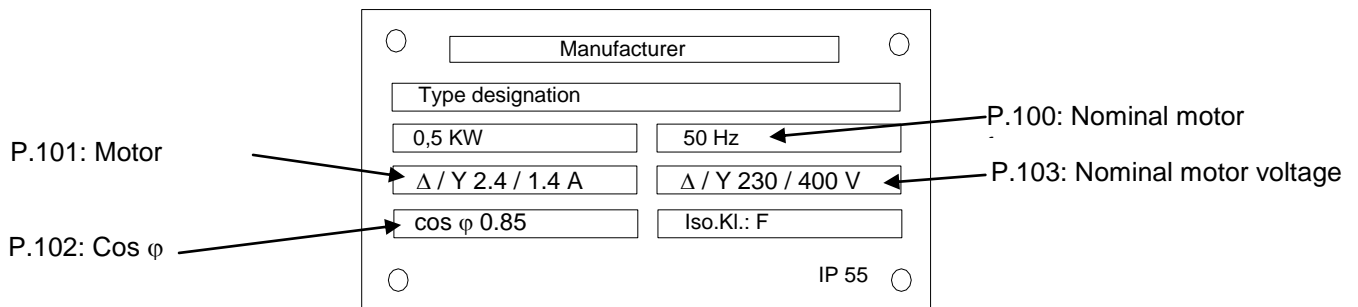


Figure 35: Typical motor nameplate (may vary)



Be sure to note the Y/Δ wiring of the motor. The motor data must be entered in accordance with the motor wiring. 400 V setting is not applicable, since the controller can source a maximum motor voltage of 230 V.

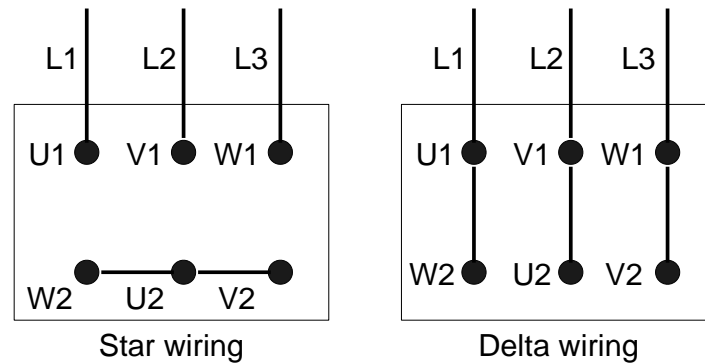



Figure 36: Star/Delta wiring



The automatic query of basic data can be interrupted by pressing the  OPEN button when the controller is being turned ON. This causes a direct jump to the parameter configuration mode.

9 Startup...




WARNING


Before starting the controller, check the electrical connections and the correct installation of the plug-in cards. After start up, the operation of all the safety devices must be checked.



The settings are performed in dead man mode, i.e. press and hold the corresponding arrow key in the corresponding direction until the desired position is reached.

9.1 ...with absolute encoder or incremental encoder


1. Open CALIBRATE mode by briefly pressing the  STOP key.
2. Move the door to the CLOSE position with the membrane keypad  CLOSE and save by pressing the  STOP key for approx. 3 seconds.



!Calibration! 0 Start with 	"CALI="
---	---------



v Nemščini EICH



If the door moves in the incorrect direction: incorrect motor rotary field, turn off controller and reverse the 2 motor connections. If the door does not move, the motor lacks power. With the aid of the boost (performance increase at low speeds) the motor can be supplied with an increase in power. (see Chapter 9.5), if necessary, if necessary, check that the brake was released.

Zur Zupos. → 	E* * E* u
0 Übern. mit 	

4. Move the door to the OPEN position by pressing the  OPEN key and press the  STOP key for approx. 3 seconds.


To Open Pos. → 	E* * E* o*
xxx Übern. mit 	



If the door does not move, the motor lacks power. With the aid of the boost (performance increase at low speeds) the motor can be supplied with an increase in power. (see Chapter 9.5), if necessary, if necessary, check that the brake was released.




The pre-limit switches and ramps are automatically adjusted by the subsequent travel of the door in automatic mode.

6. press  briefly, the door moves down and is now taught in its position.

Open Limit Set	- E o -
----------------	------------

Tor schließt I.555 Lern Fahrt	1.5 55
----------------------------------	-----------

Zu pos. OK	-* E u -
------------	-------------

7. Now press , repeat the process until the correction travel has been completed. (Message I.510 = OK)


Door opens. I.515 Correc. Fahrt	1.5 15
------------------------------------	-----------

I.510 Korrek. OK	1.5 10
------------------	-----------

Tor öffnet	o o P E
------------	------------

Tor schließt	2* U F o
--------------	-------------

9.2 ... with mechanical limit switches


1. Press the  CLOSE key to move the door to a distance of approx. 50 cm from the closed position. **If the door does not move, the motor lacks power. With the aid of the boost (performance increase at low speeds) the motor can be supplied with an increase in power. (see Chapter 9.5), if necessary, if necessary, check that the brake was released.**



The distance depends to a large extent on the door type and the speed; increase this value for fast moving doors.

If the door moves in the incorrect direction: incorrect motor rotary field, turn off controller and reverse the 2 motor connections.

2. Set lower pre-limit switch so that it just trips


3. Press the  CLOSE key to move the door to a distance of approx. 10 cm from the closed position. **The distance depends to a large extent on the door type and the speed; increase this value for fast moving doors.**



4. Set lower limit switch so that it just trips




Do not travel past the limit switch at the limit positions!

5. Press the  OPEN key to move the door to a distance of approx. 50 cm from the opened position. **If the door does not move, the motor lacks power. With the aid of the boost (performance increase at low speeds) the motor can be supplied with an increase in power. (see Chapter 9.5), if necessary, if necessary, check that the brake was released.**



The distance depends to a large extent on the door type and the speed; increase this value for fast moving doors.

6. Set upper pre-limit switch so that it just trips.

7. Press  OPEN key to move the door to approx. 10 cm from the opened position. **The distance depends to a large extent on the door type and the speed; increase this value for fast moving doors.**





8. Set upper limit switch so that it just trips



Do not travel past the limit switch at the limit positions!

9. If required by the door type: adjust upper and lower EMERGENCY limit switches. *Connect the NC contacts, e.g. the safety circuit, in series with thermo pill.*

10. By pressing the  STOP key and  OPEN key to enter parametrization mode and select Parameter P.980 "Service Mode", open and set parameter value "2" to "0" (Automatic mode).

11. Correct limit switch positions for door OPEN and door CLOSE as needed by fine adjustment of the limit positions in automatic mode.

WARNING

To prevent the door from moving unintentionally, adjust the limit switches only when the Emergency-STOP is activated or with the controller turned off !

12. The door may now be operated in automatic mode.

9.3 ... with light curtain TST LGB

Activating the TST LGB application

The application automatically sets several of the necessary function dependent parameters.

1. Set application parameter A.480: to "1".
2. **Automatic range query:** Set the real light curtain distance per parameter P.44A in steps of 0.5 m.




The range must be set to correspond to the door width.




Open the door completely!

If the light curtain has been violated, the adjacent error message will appear and the re-teach-in of all end positions must be started again.

Zur Aufpos. → Hindernis T75	E 1 0 5 *
--------------------------------	-----------


3. Start the synchronisation by briefly pressing the  STOP-key.

! Synchron. ! l615 LL angef.	1 6 1 5 5 4 n c =
---------------------------------	----------------------

4. Open the door completely by pressing the  OPEN-key.





If the door moves in the wrong direction wrong motor rotary field, switch parameter P.130 from 1 to 0 (change direction of rotation). If the door does not move, the motor lacks power. With the aid of the boost (performance increase at low speeds) the motor can be supplied with an increase in power. (see Chapter 9.5), if necessary, if necessary, check that the brake was released.

Zur Aufpos. → l615 LL angef.	5 4 E 0 *
Zur Aufpos. → STOP - Keypad 	E 0 5 0 5 4 n c =


5. Pressing the  STOP-key for approx. 3 seconds. to save the OPEN position.

To Open Pos. → 0 Übernahme mit 	5 4 E 0 *
---	-----------

6. Press  STOP-key.

Zur Aufpos. → STOP - Keypad 	5 4 E 0 *
Zur Aufpos. ok 0	5 4 E 0 *
LGx Qual. Test	5 4 E 0 *
! Synchron. ! 0 Start with 	5 4 E 0 *

Light line alignment is being requested.

1. Start automatic teach-in of  CLOSE-position by pressing the CLOSE-key.


Automatic teach-in of the CLOSE position.
Door closes.



The detection range of the light curtain must be free, otherwise the correction movement will be aborted and the synchronization of the light curtain will be restarted.

The display shows the messages in alternation: The door was recognized in the CLOSE position and the light rays were taught-in correctly.

Suche Si-Leiste xxx Auto_Zu	5 4 c L *
--------------------------------	-----------

!Korrekturfahrt! xxx Start mit 	1 5 1 5
!Korrekturfahrt! l615 LL Abgl. ok	1 6 1 0



The subsequent OPENING and CLOSING of the door in automatic mode adjusts the pre-limit switches and limit switch tapes are taught-in automatically.

2. Start correction drive by pressing the OPEN-key.

Door opens and is taught-in into the position.

Display in end position OPEN.

! Korrekturfahrt ! xxx Start mit	1 . 5 15
Door opens. I.555 Lern Fahrt	1 . 5 55
Offenh= xxs I.515 Korr. Fahrt	1 . 5 15

The door will close automatically after the auto close time has count down and moves up and down by itself until the correction drive has finished.

The Display shows the following messages:

Display that correction was completed.

Optional display during a subsequent correction.

The door closes and remains in the end position CLOSE.

The commissioning of the light curtain has been successfully completed.

Door closes. I.515 Korr. Fahrt	1 . 5 15
Offenhalt = xxs I.515 Korrekt. Fahrt	1 . 5 15
Offenh 1 = xxs I.510 Korrek. OK	1 . 5
Offenh 1 = xxs Automatik	1 . 5
Door opens.	1 . 5 15 'AUF'
Offenh 1 = xxs I 100 Auf Geschw.	1 . 100
Offenh 1 = xxs	1 10
Door closes.	2 * 'UF'
FEIG ELECTRONIC xxx Zyklen	- EU -



The end position CLOSE must usually be corrected subsequently. This can be performed via the following parameters:

221: Correction value end position door CLOSE -> this parameter must be reset after every new teach-in of all end positions (P.210=5).

P.275: Correction of increments after conclusion of the synchronization -> recommended as fine setting for the end position BELOW. The value set here must NOT be re-set after the new teach-in of all end positions.

9.4 Renewed request for "learning" limit positions

If the limit positions have been pre-taught when using electronic limit switches, but these are not suitable for the respective door, the learning process for limit positions can be requested again

The following parameter must be set for this:










- P.210 = 5 Renewed teaching of all limit positions


9.5 Boost / increase in performance for low speeds

Boost is used to increase the power of the drives at low speed. Too much or too little boost can result in improper door operation. The boost adjustment range is 0-30%. Too much boost will result in an over current fault (F.510/F.410). In this case the boost must be reduced.

If the boost is low or 0 and the motor still does not have sufficient force to move the door, the boost must be increased.

Due to the large number of door types, the correct setting for boost must be determined empirically.

1. Open parametrization mode by pressing the  STOP and  OPEN keys simultaneously.
2. Open Boost parameter by pressing the   arrow keys. Boost can be set separately for OPEN and CLOSE.
 - Boost for opening: P.140
 - Boost for closing: P.145
3. Open the parameter by momentarily pressing  STOP and use the   arrow keys to change it in small steps of max. 5, then save by pressing  STOP (longer).
4. After changing the boost, exit parametrization mode by pressing the  STOP button for a long time and test the setting in run mode.

 You can use diagnostic parameter P.910 = 2 to display the actual motor current. The boost should be set so that the motor current remains as low as possible.

10 Movement optimisation for the door

Adjusting the pre-limit switch positions and the ramps can optimize or improve the movement of the door. The following illustrations for OPEN and CLOSE moves show the operation of the frequency converter.

10.1 Opening of the door

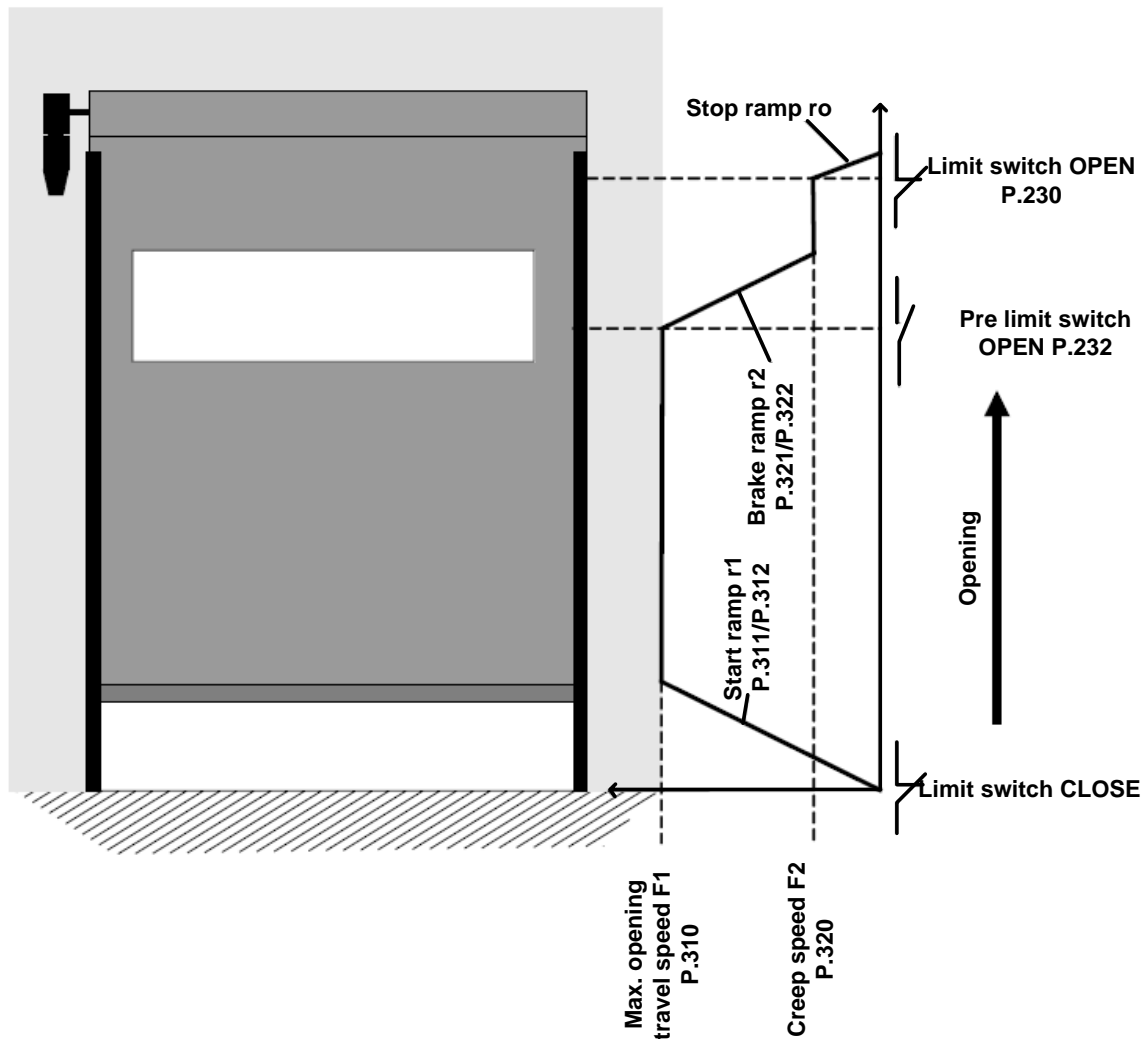


Figure 37: Opening using frequency converter

The frequency converter starts the door movement with start ramp "r1". It accelerates from 0 Hz to the max. travel speed.

The door is moved at the max. travel speed until the pre-limit switch for the limit position OPEN is reached. At this point it reduces the speed of the door to creep speed using ramp "r2". The door now moves at creep speed until the limit switch OPEN is reached.

At this point the door is stopped (ro).

10.2 Closing of the door

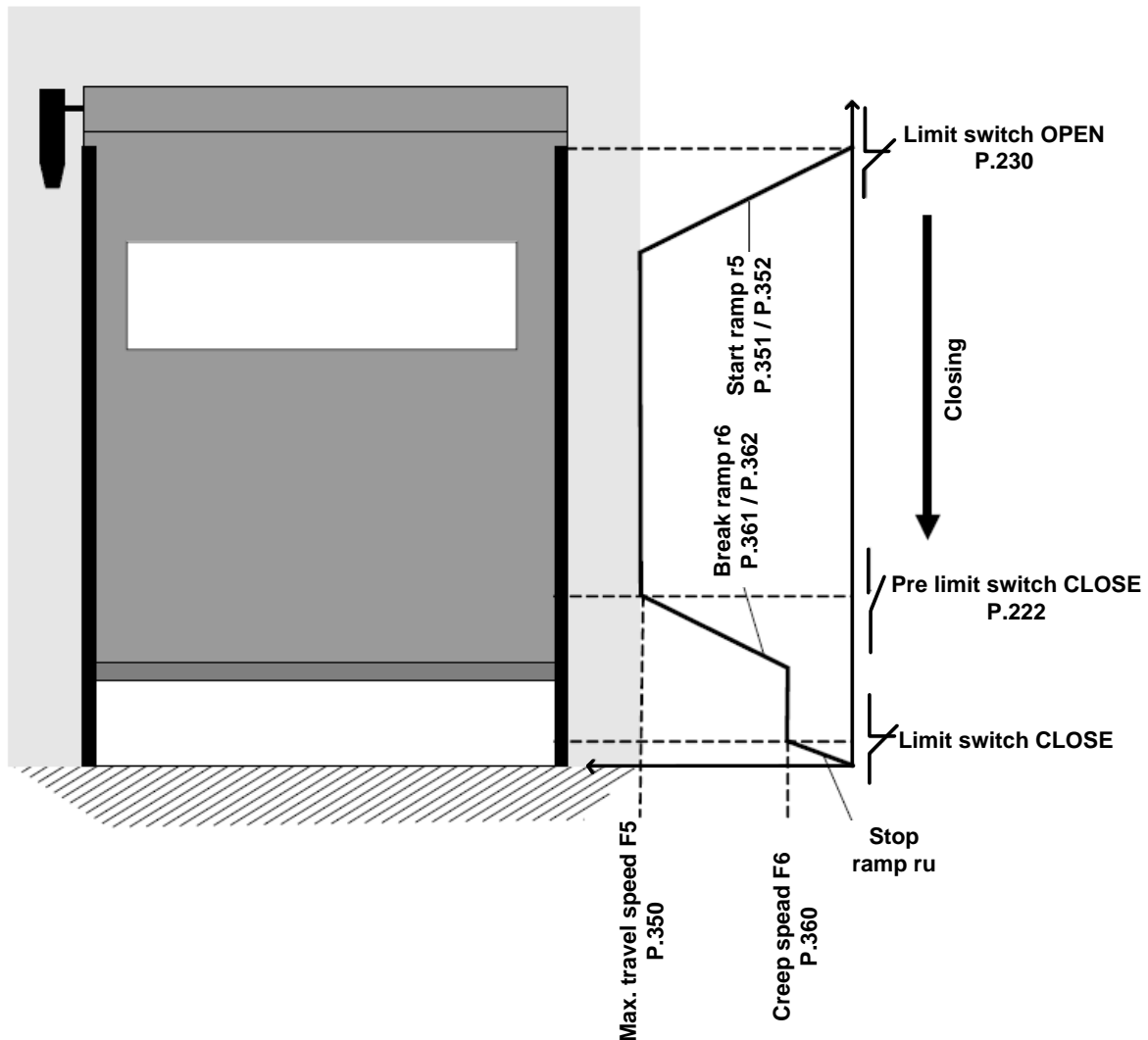


Figure 38: Closing using the frequency converter

The frequency converter starts the door movement with start ramp "r5". It accelerates from 0 Hz to the max. travel speed.

The door is moved at the max. travel speed until the pre-limit switch for limit position CLOSE is reached.

At this point it reduces the speed of the door to creep speed using ramp "r6". The door now moves at creep speed until the limit switch CLOSE is reached.

At this point the door is stopped (ru).

10.3 Pre-limit switch setting

Setting the pre-limit switch can prevent premature or late braking of the door from max. travel speed to creep speed.

The position of the pre-limit switch is given in increments. The number of increments refers to the distance between the limit switch and the pre-limit switch.

Creep too long -> reduce pre-limit switch

Creep too short -> increase pre-limit switch

P.222 = Pre-limit switch for limit position Door CLOSE The parameter value states the distance to the absolute

limit switch door CLOSED in increments. The brake ramp "r6" is initiated with the pre-limit switch.
. The slope of the ramp is set with parameter P.361 or P.362.

P.232 = Pre-limit switch for limit position Door OPEN: The parameter value states the distance to the absolute

limit switch door CLOSED in increments. The brake ramp "r2" is initiated with the pre-limit switch.
. The slope of the ramp is set with parameter P.321 or P.322.



If the automatic setting of the pre-limit switch is used (P.216 = 2), the parameters P.222 and P.232 are changed automatically.

The parameters are also changed if the travel speed or the slope of a ramp is changed as this results in a restart of the automatic limit switch correction. If these ramps are adjusted manually, P.216 must be set to less than 2!

10.4 Ramp configuration

The ramps are used by the door controller to change speed, i.e. to accelerate or decelerate.

The ramps are set in milliseconds (ms) or in Hz per second (speed change per second), i.e. the steeper the ramp, the higher the braking force or acceleration applied to the door. If the ramp is flatter the door is braked or accelerated more gently.

P.311 / P.312 = start ramp „r1“: acceleration of the door from 0 Hz to opening speed.

P.321 / P.322 = brake ramp „r2“: deceleration of the door from opening speed to creep speed.

P.351 / P.352 = start ramp „r5“: acceleration of the door from 0 Hz to opening speed.

P.361 / P.362 = brake ramp „r2“: deceleration of the door from opening speed to creep speed.

P.340 / P.342 = Ramp "r-STOP" for opening: deceleration of the door Opening speed to 0 Hz after pressing a STOP key.

P.380 / P.382 = Ramp "r-STOP" for closing: Deceleration of the door from closing speed to 0 Hz after pressing a STOP key.

10.5 Correction of the final positions

Parameters P.221 and P.231 can be used to shift the limit positions together with the pre-limit switches.

Changing these parameters in the positive direction results in the limit position being shifted upward.

Changing in the negative direction causes a shift towards the bottom.

11 Functions

You will find an overview of Parameters of this assembly instruction and there description in the added document "Parameter list TST FUZ2"


12 Messages

12.1 Error messages

Faults can be acknowledged provided they are not reset automatically.



The cause of the fault must be resolved first before the corresponding message is acknowledged.

Alternatively the  the STOP button can also be kept pressed for approx. 5 seconds.

No.	Description	Possible reason for error
F.000	Door position too far up	<ul style="list-style-type: none"> • Too small a parameter value for upper emergency limit switch → increase P.239 • Upper limit switch range (limit switch band) too small → increase P.233 • Mechanical brake defective or improperly set
F.005	Outside door position too far down	<ul style="list-style-type: none"> • Too small a parameter value for lower emergency limit switch → increase P. 229 • Lower limit switch range (limit switch band) too small → increase P. 223 • Mechanical brake defective or improperly set
F.020	Run time exceeded (during opening, closing or deadman)	<ul style="list-style-type: none"> • current motor run time has exceeded set maximum run time (P.410 (Opening), P.415 (Closing), P.419 (Deadman move)), door may be sticking or is blocked. • Door is blocked • If using mechanical limit switches, one may not have tripped
F.021	Emergency opening wrong testing	<ul style="list-style-type: none"> • The max. allowed run time (P.490) during testing has exceeded • Call service hotline
F.030	Lag error (position change of the door is less than expected)	<ul style="list-style-type: none"> • door or motor is blocked • insufficient power for providing necessary torque • too little speed • mechanical limit switch was not left or is defective • Incremental or absolute encoder shaft is slipping • wrong positioning system selected (P.205) • one motor phase is missing • the brake does not release • Settings of the failure detecting time are not correct (P.430 or P.450)
F.031	Detected rotational direction deviates from expected	<ul style="list-style-type: none"> • When using incremental encoders: Channel A and B reversed • Motor rotation direction reversed compared with calibration setting → teach in the limits new (P.210 = 5) • Too much „pancaking“ when starting, brake releases too soon, or too little torque, adjust boost (P.140 or P.145) as necessary.
F.033	Bad position transmitter protocol	<ul style="list-style-type: none"> • Fault on the position transmitter • No position data available over an extended period

No.	Description	Possible reason for error
F.043	Pre-limit switch fault (light barrier)	• The pre-limit switch for the light barrier remains activated even in the middle end position or upper end position.
F.060	Breakaway recognized	• Breakaway was detected but not fixed • The automatic lead in after breakaway has failed
F.061	Belt breakage	An input configured as belt breakage sensor (P.50x = 0416) was activated. As long as the display flashes quickly, movements are not permitted -> acknowledgment required. Brief foil keyboard stop permits deadman moves. When the belt break was repaired mechanically and the input is no longer active an automatic acknowledgment is issued when the deadman closing movement reaches the closed.
F.063	Balance error on loop 3	• disturbing surrounding • Loop out of tolerance range
F.064	Balance error on loop 4	• disturbing surrounding • Loop out of tolerance range
F.080	Maintenance is required	• Service counter has expired
F.090	Controller not parameterized	• The min. necessary basic parameters for the controller have not yet been set → Activate DIP-switch and put in the asked parameters.
F.201	internal E-Stop "mushroom button" tripped or watchdog (monitoring)	• E-Stop chain was interrupted starting at input „internal E-Stop“ without parameterizing mode having been selected • Internal parameter or EEPROM checks defective, pressing the STOP button provides additional information about the cause.
F.211	External E-Stop 1 tripped	• E-Stop chain was interrupted starting at Input 1
F.212	External E-Stop 2 tripped	• E-Stop chain was interrupted starting at Input 2
F.320	Obstacle during opening	• During opening an obstacle has recognized
F.325	Obstacle during closing	• During closing an obstacle has recognized
F.360	Short circuit detected on edge input	• Short circuit detected on edges with normally closed contact • The light beam of the optical edge is interrupted • Jumper for 1K2 / 8K2 is wrong set
F.361	Number of trips of the Safety input D, normally this is the integrated safety edge evaluation, has reached set limit (configurable in P.46E)	• Parameterized, maximum number of trips of the safety input D during a door cycle was exceeded → To reset close the door in deadman mode • Check the set number of trips in P.46E
F.362	Redundancy error with short circuit	• One of the processing channels for short circuit detection does not react identically with the second channel → Controller board defective, if no other error message F.3xx is shown • Dynamical optical safety edge connected but not set in Parameter P.460
F.363	Interruption on edge input	• Connection cable defective or not connected • Termination resistor incorrect or missing • Jumper 1K2 / 8K2 incorrectly set

No.	Description	Possible reason for error
F.364	Safety edge – testing failed	<ul style="list-style-type: none"> • Safety edge was not activated as expected when requesting a test. • The time between request for testing and actual testing not in agreement • The pre-limit switch is set incorrectly
F.365	Redundancy error with interruption	<ul style="list-style-type: none"> • One of the processing channels for interruption detection does not react identically with the second channel → Controller board defective, if no other error message F.3xx is shown • Dynamic optical system connected but not set in Parameter P.460
F.366	Too high a pulse frequency for optical safety edge	<ul style="list-style-type: none"> • Defective optical safety edge • Defective input for internal safety edge
F.369	Internal safety edge incorrectly parameterized	<ul style="list-style-type: none"> • An internal safety edge is connected but deactivated → set P.460 to the used edge type
F.36A	Redundancy error of the 8K2 slip door switch on the internal safety edge evaluation unit	<ul style="list-style-type: none"> • One of the contacts of the redundant 8k2 slip door switch is defective • The slip door was not fully opened or closed
F.371	Number of trips of the Safety input E, normally this is the integrated safety edge evaluation, has reached set limit (configurable in P.47E)	<ul style="list-style-type: none"> • Parameterized, maximum number of trips of the safety input E during a door cycle was exceeded → To reset close the door in deadman mode • Check the set number of trips in P.47E
F.372	Redundancy error with short circuit	<ul style="list-style-type: none"> • One of the processing channels for short circuit detection does not react identically with the second channel. • Controller board defective
F.373	Fault in the safety edge (message comes from module)	<ul style="list-style-type: none"> • Cable break to safety edge, no edge connected, edge termination resistor incorrect or defective • Jumper for termination resistor definition in wrong position. • Safety edge processing selected with Parameter P.470, but module not plugged in or wrong module.
F.374	Safety edge – testing failed	<ul style="list-style-type: none"> • Pre-limit switch for safety edge incorrectly set or defective • Processing module defective • Safety edge defective
F.379	Safety edge detection defective (coding pin or parameter setting)	<ul style="list-style-type: none"> • No module plugged in but was reported as present by a parameter • The controller was started up with another module than the one currently plugged in
F.37A	Redundancy error of the 8K2 slip door switch on the internal safety edge evaluation unit channel 1	<ul style="list-style-type: none"> • One of the contacts of the redundant 8k2 slip door switch is defective • The slip door was not fully opened or closed
F.380	Short circuit detected on safety input	<ul style="list-style-type: none"> • Short circuit detected on edges with normally closed contact

No.	Description	Possible reason for error
F.383	Interruption on safety input	<ul style="list-style-type: none"> • Connection cable defective or not connected • Termination resistor incorrect or missing • Jumper incorrectly set
F.384	Safety input – testing failed	<ul style="list-style-type: none"> • Safety edge was not activated as expected when requesting a test. • The time between request for testing and actual testing not in agreement
F.385	Fault in pre-limit switch for safety edge	<ul style="list-style-type: none"> • Pre-limit switch for turning off the safety edge or reversing after safety edge tripping remains tripped even in the upper end position.
F.386	Too high a pulse frequency for optical safety edge	<ul style="list-style-type: none"> • Defective optical safety edge • Defective input for internal safety edge
F.389	Safety input incorrectly parameterized	<ul style="list-style-type: none"> • A safety edge is connected but deactivated <p>Safety input Jumper incorrectly set (as digital input jumpered but as safety edge set)</p>
F.38A	Redundancy error of the 8K2 slip door switch on the second internal safety edge evaluation unit	<ul style="list-style-type: none"> • One of the contacts of the redundant 8k2 slip door switch is defective • The slip door was not fully opened or closed
F.3A1	Number of trips for safety input A has reached set limit	<ul style="list-style-type: none"> • Parameterized, maximum number of safety input trips during a door cycle was exceeded
F.3B1	Number of trips for safety input B has reached set limit	<ul style="list-style-type: none"> • Parameterized, maximum number of safety input trips during a door cycle was exceeded
F.3C1	Number of trips for safety input C has reached set limit	<ul style="list-style-type: none"> • Parameterized, maximum number of safety input trips during a door cycle was exceeded
F.400	Controller hardware reset detected	<ul style="list-style-type: none"> • Excessive noise on supply voltage • Internal watchdog tripped • RAM error
F.401	Watchdog Error	<ul style="list-style-type: none"> • Internal Watchdog has released
F.40A	Software Exeption	<ul style="list-style-type: none"> • Internal error detected
F.40B	Communication error expansion board	<ul style="list-style-type: none"> • The communication between main board and expansion board is disturbed
F.40C	Unknown extension board (CAN connection)	<ul style="list-style-type: none"> • Incorrect hardware coding of the extension board • Control software does not support the expansion card • Expansion card defective
F.410	Over-current (motor current or DC-bus)	<ul style="list-style-type: none"> • Wrong motor data set (P.100 – P.103) • Non-adjusted voltage increase / boost set (P.140 or P.145) • Motor not properly dimensioned for door • Door sticks

No.	Description	Possible reason for error
F.420	Overvoltage in DC-bus Limit 1	<ul style="list-style-type: none"> • Brake chopper interference / defective / missing • Feed voltage much too high • Motor is generating excessive voltage - brake chopper cannot dissipate the re-generated energy.
F.425	Overvoltage line supply	<ul style="list-style-type: none"> • The supply voltage for the controller is too high
F.426	Undervoltage line supply	<ul style="list-style-type: none"> • The supply voltage for the controller is too low
F.430	Temperature heat sink outside of working range Limit 1	<ul style="list-style-type: none"> • Excessive load on power stage or brake chopper • Ambient temperature too low for controller operation • Clock frequency of power stage too high (Parameter P.160)
F.435	Housing temperature high	<ul style="list-style-type: none"> • The temperature inside the controller housing is too high
F.440	Overcurrent in DC-bus Limit 1	<ul style="list-style-type: none"> • Boost not adjusted • Motor incorrectly dimensioned for door • Door sticks
F.510	Motor / DC-bus overcurrent Limit 2	<ul style="list-style-type: none"> • Wrong motor data set (P.100–P.103) • Non-adjusted voltage increase / boost set (P.140 or P.145) • Motor not properly dimensioned for door • Door sticks
F.511	No DC supply	<ul style="list-style-type: none"> • The DC voltage can not be given to the motor (overcurrent error, IGBT error F.519, 24 V error or over temperature) • The emergency stop is activated
F.512	Offset motor current / link current incorrect	<ul style="list-style-type: none"> • Hardware faulty
F.515	Motor protection function detected overcurrent	<ul style="list-style-type: none"> • Incorrect motor curve (motor rated current) set (P.101) • Too much boost (P.140 or P.145) • Motor incorrectly dimensioned
F.519	IGBT driver chip detected overcurrent	<ul style="list-style-type: none"> • Short circuit or ground fault on motor terminals • Motor rated current setting extremely wrong (P.100) • Extremely too much boost (P.140 or P.145) • Motor incorrectly dimensioned • Motor winding defective • Momentary interruption of the E-Stop circuit.
F.520	Overvoltage in DC-bus Limit 2	<ul style="list-style-type: none"> • Brake chopper interference / defective / missing • Incoming mains voltage much too high • Motor is generating excessive voltage - brake chopper cannot dissipate the re-generated energy
F.521	Low voltage in DC-bus	<ul style="list-style-type: none"> • Input voltage supply too low, usually at load • Load too great / final stage or brake chopper fault
F.524	ext. 24 V supply missing or too low	<ul style="list-style-type: none"> • Overload but no short circuit • When 24V is shorted the controller voltage does not ramp up and glow lamp V306 comes on.
F.525	Overvoltage at the incoming mains supply	<ul style="list-style-type: none"> • The incoming mains supply for the Controller is too high • The incoming mains supply fluctuates very extremely

No.	Description	Possible reason for error
F.530	Heatsink temperature outside of working range Limit 2	<ul style="list-style-type: none"> • Excessive load on final stages or brake chopper • Ambient temperature too low for controller operation • Clock frequency of final stage too high (Parameter P.160)
F.535	Housing temperature high	<ul style="list-style-type: none"> • The temperature inside the controller housing is too high
F.540	Overcurrent in DC-bus Limit 2	<ul style="list-style-type: none"> • Boost not adjusted • Motor incorrectly dimensioned for door • Door sticks
F.601	Bad light curtain reception quality	Reception quality is too bad during commissioning of the light curtain
F.610	LGB Light line alignment	Light line alignment has not been done
F.612	LGB RS485	RS485 communication error -> not enough valid position data
F.615	LGB internal transmitter	Internal error transmitter Indicates: <ul style="list-style-type: none"> - RAM test fail - ROM test fail - Program run error - Sync error - Address module defective - dark test fail - DA converter defective exchange hardware!
F.621	Light curtain test error (transmitter)	test error for the internal transmitter system test
F.622	Light curtain test error (receiver)	test error for the internal receiver system test
F.626	Light curtain test error (Out 1)	Test / wiring error of output 1
F.627	Light curtain test error (Out 2)	Test / wiring error of output 2
F.700	Position sensing defective	With mechanical limit switches: <ul style="list-style-type: none"> • At least one limit switch does not correspond to the configured active status. • An implausible combination of at least 2 active limit switches. For electronic limit switches: <ul style="list-style-type: none"> • After invoking activation of the factory parameters (Parameter P.990) the corresponding positioning system was not parameterized. • Calibration not completed or is incorrect and must be repeated. • When activating the intermediate stop the intermediate stop is implausible. • Synchronization not finished or reference switch defective.
F.701	CLOSE Position not found in timer mode	<ul style="list-style-type: none"> • The simulated end switch CLOSE was not reached at the expected position • The tolerance band for the recognition time is too small (P.229)
F.702	OPEN Position not found in timer mode	<ul style="list-style-type: none"> • The simulated end switch OPEN was not reached at the expected position • The tolerance band for the recognition time is too small (P.239)

No.	Description	Possible reason for error
F.752	Loss of communication with encoder	<ul style="list-style-type: none"> • Interface cable defective / interrupted • Channel A and B connected over cross • Absolute encoder processor electronics defective • Defective hardware or electrically noisy environment • Use a shielded control cable • Install a RC element (100Ω+100nF) at the brake
F.760	Position outside of window	<ul style="list-style-type: none"> • Position encoder drive defective • Absolute encoder processing electronics defective • Defective hardware or electrically noisy environment
F.763	DES-B Error	• Position encoder drive defective -> make a reset
F.766	Internal error TST PD/PE	• The position encoder TST PD / PE is disturbed -> make a reset
F.767	Overtemperature TST PD	• The temperature in the encoder housing is to high
F.768	Battery voltage	• The voltage of the buffer battery is to low → change battery
F.769	Rotation speed of PD shaft to high	• The rotation speed of the shaft where the encoder is mounted is to high → mount the encoder on another shaft
F.770	Door way is to high for the parameter set Encoder resolution	• The Value of the Parameter P.202 (set Encoder resolution) is to high for the combination encoder and door.
F.801	Wrong Test of input 1 of the mobile unit TST FSx	<ul style="list-style-type: none"> • Input 1 of the mobile unit was tested wrong • The device which is connected to the input does not work correctly • The mobile unit is defective
F.802	Wrong Test of input 2 of the mobile unit TST FSx	<ul style="list-style-type: none"> • Input 2 of the mobile unit was tested wrong • The device which is connected to the input does not work correctly • The mobile unit is defective
F.803	Wrong Test of input 3 of the mobile unit TST FSx	<ul style="list-style-type: none"> • Input 3 of the mobile unit was tested wrong • The device which is connected to the input does not work correctly • The mobile unit is defective
F.804	Wrong Test of input 4 of the mobile unit TST FSx	<ul style="list-style-type: none"> • Input 4 of the mobile unit was tested wrong • The device which is connected to the input does not work correctly • The mobile unit is defective
F.80A	Wrong Test of input A of the stationary unit TST FSx	<ul style="list-style-type: none"> • Input A of the stationary unit was tested wrong • The device which is connected to the input does not work correct • The stationary unit is defective

No.	Description	Possible reason for error
F.80B	Wrong Test of input B of the stationary unit TST FSx	<ul style="list-style-type: none"> • Input B of the stationary unit was tested wrong • The device which is connected to the input does not work correct • The stationary unit is defective
F.80C	Wrong Test of input C of the stationary unit TST FSx	<ul style="list-style-type: none"> • Input C of the stationary unit was tested wrong • The device which is connected to the input does not work correct • The stationary unit is defective
F.811	Wrong test for output 1 of the stationary unit	<ul style="list-style-type: none"> • Output 1 of the stationary unit was tested incorrectly • The cable between the stationary unit and the controller is damaged or not connected • The stationary unit is defective • Incorrect settings for parameter P.5xF, P.47b or P.465
F.812	Wrong Test for output 2 of stationary unit TST FSx	<ul style="list-style-type: none"> • Output 2 of the stationary unit was tested incorrectly • The cable between stationary unit and controller is damaged or not connected • The stationary unit is defective • Incorrect settings for parameter P.5xF, P.47b or P.465
F.813	Wrong Test of output 3 of the stationary unit TST FSx	<ul style="list-style-type: none"> • Output 3 of the stationary unit was tested incorrectly • The cable between the stationary unit and the controller is damaged or not connected • The stationary unit is defective • Incorrect settings of parameter P.5xF, P.47b or P.465
F.821	Wrong parameter setting input 1 of mobile unit	<ul style="list-style-type: none"> • The device which is connected to input 1 of the mobile unit does not fit to the settings • Check Parameter P.F1F
F.822	Wrong parameter setting input 2 of mobile unit	<ul style="list-style-type: none"> • The device which is connected to input 2 of the mobile unit does not fit to the settings • Check Parameter P.F2F
F.823	Wrong parameter setting input 3 of mobile unit	<ul style="list-style-type: none"> • The device which is connected to input 3 of the mobile unit does not fit to the settings • Check Parameter P.F3F
F.824	Wrong parameter setting input 4 of mobile unit	<ul style="list-style-type: none"> • The device which is connected to input 4 of the mobile unit does not fit to the settings • Check Parameter P.F4F
F.831	Disturbed input 1 of mobile unit TST FSx	<ul style="list-style-type: none"> • The input 1 of the mobile unit is disturbed • The connection to the device is interrupted
F.832	Disturbed input 2 of mobile unit TST FSx	<ul style="list-style-type: none"> • The input 2 of the mobile unit is disturbed • The connection to the device is interrupted
F.833	Disturbed input 3 of mobile unit TST FSx	<ul style="list-style-type: none"> • The input 3 of the mobile unit is disturbed • The connection to the device is interrupted
F.834	Disturbed input 4 of mobile unit TST FSx	<ul style="list-style-type: none"> • The input 4 of the mobile unit is disturbed • The connection to the device is interrupted
F.841	Frequency error on input 1 of mobile unit	<ul style="list-style-type: none"> • The connected optical safety edge is faulty
F.843	Frequency error on input 3 of mobile unit	<ul style="list-style-type: none"> • The connected optical safety edge is faulty

No.	Description	Possible reason for error
F.851	Max. Number of allowed Reversings, because of bad WiCAB radio, exceeded.	The radio connection interrupts during door drive for a short time
F.852	Communication error between TST FSx and controller	This error occurs when the controller loses RS485 communication for min. 1 second with the stationary unit of the radio strip TST FSx. Possible causes are: <ul style="list-style-type: none"> • The stationary unit is broken • The stationary unit is not or wrong connected
F.853	TST PE_FSBS operating voltage too low	The operating voltage of encoder TST PE_FSBS is too low (less than 8V) As a result, the calculation of the position must be terminated.
F.856	Communication error between mobile and stationary unit	This error occurs if the mobile unit and the stationary unit of the radio control unit could not establish radio communication for at least 1 second. Possible causes are: <ul style="list-style-type: none"> • No mobile unit in radio range • The battery of the mobile unit is empty or not connected • The antenna of the stationary unit is not connected or missing • Mobile unit or stationary unit is defective
F.857	Battery empty	<ul style="list-style-type: none"> • The battery voltage is under the limit set with Parameter P.F0B • The battery voltage of the mobile unit is too low • Use new battery and set back battery capacity to 100% by pressing the stop key for long time in P.F09. • To deactivate this error message you can set P.F09 and P.F0B to 0
F.859	Software version	The software versions of the stationary and the mobile unit are not compatible. No safe trip possible.
F.860	Internal fault stationary unit	Internal system fault on the stationary unit.
F.861	Internal fault mobile unit	Internal system fault on the mobile unit.
F.862	Internal positioning system error	Internal error of the positioning system. Presumably, the magnet is not attached properly.
F.867	Address of mobile unit not set	<ul style="list-style-type: none"> • The address of the mobile unit was not set so far • The address has to be set in Parameter P.F07 • The address is written on a sticker on the mobile unit
F.910	No communication to expansion board possible	<ul style="list-style-type: none"> • The communication to the expansion board is not possible • No expansion board plugged in • CAN Connection interrupted (Broken cable or no supply voltage for extension board)
F.911	ROM error on extension board	<ul style="list-style-type: none"> • Wrong Flash-Code • Defective hardware or noise-saturated environment
F.912	RAM error on extension board	<ul style="list-style-type: none"> • Defective hardware or noise-saturated environment
F.920	Internal 2.5 V reference voltage incorrect	<ul style="list-style-type: none"> • Hardware defect

No.	Description	Possible reason for error
F.921	Internal 15 V voltage incorrect	• Hardware defect
F.922	E-Stop chain not complete	Not all E-STOP inputs are separately jumpered although the entire E-Stop chain is jumpered • Redundant checking of the E-Stop chain tripped
F.925	Testing of the third shutdown method failed	• defective hardware
F.928	Faulty input testing	• The testing of an cyclic tested input was not successful • The connected device is not working • The cable connection between the connected device and the controller is broken
F.92A	If the motor wiring test is activated by P.112 the wiring will be tested during system tests.	• min. one of the motor cables is not good or nor connected • Motor cable damaged • Motor damaged
F.930	External watchdog incorrect	• Defective hardware or noise-saturated environment
F.931	ROM error	• Wrong EPROM code • Defective hardware or noise-saturated environment
F.932	RAM error	• Defective hardware or noise-saturated environment
F.933	Wrong frequency of CPU	• The clock frequency of the processor is wrong
F.935	Stack error	• User-Stack or System-Stack overflowed • Possible software error due to recursive invocations (e.g. profile)
F.942	RAM Error of I/O Processor	• RAM Error of I/O Processor
F.960	Faulty parameter checksum	• New EPROM version with different parameters • Controller not yet initialized
F.961	Checksum from calibration values etc.	• New EPROM version with different EEPROM structure • Controller not yet initialized
F.962	Converter parameters not plausible	• New EPROM version • Controller not yet initialized
F.964	Program version / manufacturer code	• New EPROM version • Controller not yet initialized
F.965	Faulty door cycle counter with active emergency opening	• The door cycle counter does not count or is faulty. Because of this no emergency opening testing can be done.
F.966	Hardware unknown	• A wrong software was programmed to the controller • The programmed software does not know the hardware version • The controller hardware is broken
F.968	Programming error with Real time clock	• The clock is not programmed plausible
F.969	Internal error Real time clock	• The clock has an error → make a reset
F.970	Plausibility parameter block error	• New EPROM version • Controller not yet initialized • Some parameter is implausible

12.2 Information messages

No.	Description
I.021	Emergency open test is running
I.080	Service counter will run off
I.100	Speed in open position to high
I.150	Speed in close position to high
I.160	Permanent open comand still active
I.161	Priority still active
I.170	Forced opening active
I.180	Wait for foil key command
I.185	Wait for reset by stop foil key
I.199	Door counter wrong
I.200	New reference position taken over
I.201	Reference position new initialized
I.205	Synchronisation done
I.210	Limit switch not plausible
I.211	Limit switch not plausible
I.310	Open command to door 2
I.320	Obstacle during opening
I.325	Obstacle during closing
I.360	Disturbed N.C. safety edge
I.363	Disturbed N.O. safety edge
I.380	Faulty 2nd internal N.C. safety bar
I.383	Faulty 2nd internal N.O. safety bar
I.510	Correction drive finished
I.515	Active correction drive
I.520	Target speed for opening or closing move not reached <ul style="list-style-type: none"> • Pre-limit switch reached before full speed was reached --> adjust ramps • Current limiter prevents movement at full speed --> Inverter or motor working at performance limit --> adjust ramps or limiter
I.555	Measuring rotation factor not ready
I.610	Light line alignment completed successfully.
I.615	Light line alignment requested.
I.620	Door in PU when syncing but some rays of light are still masked. Adjust P.446 door masking in PU!

No.	Description
I.621	The resolution of the installed position encoder is too low to maintain robust light curtain operation. More increments are required per door move. (Message only occurs when DIP-Switch is ON.)
I.700	In timer limit switch operating mode (typ. after power on) the door position is not available. Deadman speed is maintained until the actual position becomes available again.
I.856	The internal safety edge is tripped because of an WiCab radio problem The radio connection interrupts during door drive for a short time. Possible causes are: <ul style="list-style-type: none">• The Distance between mobile and stationary unit is larger than specified• No perfect Orientation of stationary and mobile antenna• The radio link is disturbed by external noise


13 General messages


General messages	
STOP	Stop / Reset state, wait for next incoming command
Eu	Lower limit position
≡Eu≡	lower limit position locked → raising not possible (e.g., lock-door)
ZUF ▢	Closing active
-Eo-	Upper limit position
≡Eo≡	upper limit position locked → closing not possible (e.g., safety edge)
▢OPE	Opening active
-E1-	middle limit position E1 (intermediate stop position)
≡E1≡	upper limit position → locked closing not possible (e.g., safety edge)
FAIL	Fault → only deadman travel is possible, automatic opening may also be possible
"CALI:	Calibration → setting the limit positions in deadman travel mode (for absolute encoder) → Start procedure using STOP key
≡NA≡	E-stop → Travel not possible, hardware safety chain interrupted
HdSA:	E-travel → Deadman travel without regard for safety facilities, etc.
'Hd'	Manual → Deadman mode
ParA	Parametrization
SYNC:	Synchronization (incremental encoder / limit switch → Pos.unknown)
'Au'	Automatic → indicates change from "Manual" to "Automatic" status
'Hc'	Semi automatic → indicates change from "Manual" to "Semi-automatic"
WU:	first display after switching on (Power Up and Self-test)
Status messages during calibration	
E.i.E.c.:	calibration of the lower limit position requested (in deadman travel)
E.i.E.o.:	calibration of the lower limit position requested (in deadman travel)
E.i.E.1	calibration of intermediate position E1 (in deadman travel)
Status messages during synchronization:	
S.y.E.c.:	Synchronization of lower limit position requested (deadman or wait for starting condition)
S.y.E.o.	Synchronization of lower upper position requested (deadman or wait for starting condition)
S.y.E.1	Synchronization of intermediate stop position E1 (in deadman mode)
S.y.op:	Automatic opening up to mechanical stop, then automatic synchronization of upper limit position
S.y.cL	Automatic closing taking into account safeties up to mechanical stop, followed by automatic synchronization of lower limit position
S.y.c≡	Automatic closing is locked due to request Å
Status messages during dead man movement:	
Hd.cL	Deadman closing (membrane key: CLOSE)
Hd.oP	Deadman closing (membrane key: OPEN)
Hd.Eu	Lower limit position reached, no further deadman closing possible
Hd.Eo	Upper limit position reached, no further deadman opening possible
Hd.Ao	Outside of permitted Eo position (no deadman opening possible)
Information messages during the parameter configuration:	
noEr	Error memory: no error saved
Er--	Error memory: if error but without associated message being found
Prog	Programming message while carrying out original parameter or default set

General inputs	
E.000	OPEN key on membrane keypad
E.050	STOP key on membrane keypad
E.090	CLOSE key on membrane keypad
E.101	Input 1
E.102	Input 2
E.103	Input 3
E.104	Input 4
E.105	Input 5
E.106	Input 6
E.107	Input 7
E.108	Input 8
E.109	Input 9
E.110	Input 10
E.111	Input 11
E.112	Input 12
E.113	Input 13
E.114	Input 14
E.115	Input 15
E.121	Input 21
E.122	Input 22
E.123	Input 23
E.124	Input 24
E.125	Input 25
E.126	Input 26
E.127	Input 27
E.128	Input 28
E.13A	Input 3A
E.13B	Input 3B
E.13C	Input 3C
E.13D	Input 3D
E.13E	Input 3E
E.13F	Input 3F
Safety- / emergency stop chain	
E.201	internal E-Stop "mushroom button" tripped
E.211	External E-Stop 1 tripped
E.212	External E-Stop 2 tripped
Safety edge in general	
E.360	Triggering of the 2nd internal safety edge
E.363	Internal safety edge 1 faulty
E.370	Triggering of the 2nd external safety edge
E.373	External safety edge fault
E.379	External safety edge activated but not yet plugged in
E.380	Triggering of the 2nd internal safety edge
E.383	Interruption of the 2nd internal safety edge
E.3F0	Triggering of the 2nd external safety edge
E.3F3	Interruption of the 2nd internal safety edge
Wireless plug-in module	
E.401	Wireless Channel 1
E.402	Wireless Channel 2
Inductive loop	
E.501	Detector channel 1
E.502	Detector channel 2
E.503	Detector channel 3
E.504	Detector channel 4
Internal-Inputs	
E.900	Controller chip fault signal

WiCab-Inputs	
E.F01	Input 1 of mobile unit
E.F02	Input 2 of mobile unit
E.F03	Input 3 of mobile unit
E.F04	Input 4 of mobile unit
E.F0A	Input A of stationary unit
E.F0B	Input B of stationary unit
E.F0C	Input C of stationary unit

14 Specifications

Housing dimensions (W x H x D)		
Version -A / -B	182 x 328 x 102 mm (with spacers)	
Version -C / -CX	182 x 328 x 121 mm	
Version -CGH / -CXGH / -LGH	210 x 420 x 200 mm	
Assembly:	Vertical using wall bracket on housing bottom	
Supply voltage over L, N, PE	230 V _{AC} ±10%, 50...60 Hz permissible range: 110...240 V ± 10% / 50...60 Hz Protection: 16 A K-characteristic	
Controller idling current	max. 30 W when fully configured	
External power supply (depending on network): Terminal L1	According to supply voltage to terminal L (secured on the circuit board: F200 / 4AT)	
Control voltage / external supply 2	24 V _{DC} regulated (±10% at nominal voltage 230 V) Version -A: max. 250 mA Version -B / -C / -CX / -CGH / -CXGH / -LGH: max. 500 mA ncl. optional plug-in modules. Fuse protected by means of self-resetting semiconductor fuse. Short-circuit protected by central switching regulator.	
Control voltage / external supply 3	for electronic limit switches and Safety edge Nominal value 11.3V / max. 130mA	
Controller inputs Inputs 1 – 10 in Version -C / -CX / -CGH / -CXGH / -LGH Inputs 1 – 9 in Version -A	24 VDC / typ.15 mA, max 26 VDC / 20 mA. all inputs are potential free to join or: <2 V: inactive logical 0 → >10.5 V: inactive logical 1 → min. Duration of input control commands: > 100 ms Galvanic isolation using on-board opto-couplers	
Input IN10 Version -B	Evaluation for slip door switch with 8,2 kΩ termination resistor or is used as a second safety edge monitor.	
Serial interface RS485 A and B	only for electronic limit switches RS485 level, terminated in 100 Ω	
Safety chain / E-STOP terminals: <i>emergency-stop ext.31/32 and 41/42</i>	all inputs must be connect free of potential Contact rating: ≤ 26 V _{DC} / ≤ 120 mA in case the safety chain is interrupted, the drive cannot be moved, not even under Deadman conditions Not jumpered from the factory	
Safety edge input:	For electrical safety edges with 1.2 or 8.2 kΩ terminating resistor and for dynamic optical systems	
Relay outputs	If inductive loads are connected (for example, additional relays or brakes), these must be quipped with the appropriate suppression measures (freewheeling diode, varistors, RC elements)	
Relay K1 and K2	Changeover contact free of potential • min. 10 mA • Max. 230 VAC / 3 A	 ATTENTION Contacts used once for circuit breakers cannot switch further low currents.
Digital Output OUT15 For version -B/-C / -CX / -CGH / -CXGH / -LGH	24 VDC / min. 10 mA / max. 120 mA Generell application: All types of resistive, inductive and capacitive loads in industrial applications	

Drive output Version –A / -B / -C / -CGH	for drives up to 0.75 kW at 230 V Motor constant current at 100% duty factor and 40°C ambient temperature: 3 A Motor current at 40% duty factor and 50°C ambient temperature: 5 A Max. length of motor cable: 30 m Overload for 0.5 s: 10 A
Drive output Version -CX / -CXGH	for drives up to 1.2 kW at 230 V Motor constant current at 100% duty factor and 40°C ambient temperature: 5 A Motor current at 40% duty factor and 50°C ambient temperature: 8 A Max. length of motor cable: 30 m Overload for 0.5 s: 16 A
Drive output Version -LGH	for drives up to 1.5 kW at 230 V Motor constant current at 100% duty factor and 40°C ambient temperature: 8 A Motor current at 40% duty factor and 50°C ambient temperature: 10 A Max. length of motor cable: 30 m Overload for 0.5 s: 20 A
Brake chopper and resistor Version –C / –CX / -CGH / -CXGH / -LGH	Max. 1.5 kW for max. 0.5 seconds repetition rate min. all 20 seconds  ATTENTION The heatsink / brakeresistor on the back of the housing can reach temperatures up to 85° C. In case of failure this may briefly reach 280 ° C (< 5 Min.)!
Temperature operating range	-20...+50°C
Temperature storage range	-20...+70°C
Relative humidity	up to 95% non condensing
Noise Emission	<20 dB (A)
Protection class	IP54 (only in respect of enclosure)
Weight	approx. 5 kg
Equipment mobility:	stationary
Equipment type:	Motor type external motor is not part of the delivery from FEIG ELECTRONIC GMBH
Protection class:	Protection class I

15 Directives and Standards

Type tested to:	Standards:
Machinery Directive:	<p>➔ Device complies with Annex IV categories of machinery – Section 21 "logic unit for safety functions"</p> <p>"EN ISO 13849-1:2008 Safety of machinery – safety-related parts of control systems –part 1: General design principles</p> <ul style="list-style-type: none"> • Category: 2 • Performance Level (PL): d • Safe functions: <ul style="list-style-type: none"> ○ Endpoint detection ○ Contacting edge evaluation (8,2/1,2 kΩ or optical) ○ Photo eye incl. pull-in protection (comp. EN 12453 table 1: type D or type E with test) ○ Slip door switch ○ Slack rope switch ○ Plug-in module TST SURAx ○ Wireless safety system TST FSx <p>EN 62061 : 2005 Safety of machinery–Functional safety of safety-related electrical, electronic and programmable electronic control systems (IEC 62061:2005)</p> <ul style="list-style-type: none"> • Safety integrity levels (SIL): 1
Low-Voltage Directive: 2014/35/EU	<p>DIN EN 60335-1: 2012 Safety of household and similar electrical appliances/ Part 1: General requirements</p> <ul style="list-style-type: none"> • Type: stationary motor-driven machines • Protection class I <p>EN 60335-2-103:2003 Safety of household and similar electrical appliances- - part 2-103: Special requirements for drives for industrial doors, doors and windows</p>
EMC Directive: 2014/30/EEC	<p>Electromagnetic compatibility – basic technical standards:</p> <p>EN 61000-6-1:2007 interference immunity, living area</p> <p>EN 61000-6-2:2006 interference immunity, industrial area</p> <p>EN 61000-6-3:2007 Electromagnetic radiation, living area</p> <p>EN 61000-6-4:2007 Electromagnetic radiation, industrial area</p>
Applied national specifications regarding the above directives:	<p>EN 12453:2001 Safety in use of power operated doors - Requirements</p> <ul style="list-style-type: none"> • Chapter 5.2 Drive Systems and Power Supply



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EG-Konformitätserklärung

nach EG-Maschinenrichtlinie 2006/42/EG, Anhang II A

Hiermit erklären wir, dass die nachstehende Maschine:

Bezeichnung	Torsteuerung
Typ / Handelsbezeichnungen	TST FUZ2

den einschlägigen Bestimmungen folgender Richtlinien entspricht:

Maschinenrichtlinie	2006/42/EG
Niederspannungsrichtlinie	2014/35/EU
ROHS2	2011/65/EU
EMV	2014/30/EU

Angewandte harmonisierte Normen:

EN ISO 13849-1:2015	Sicherheit von Maschinen – Sicherheitsbezogene Teile von Steuerungen
EN 60335-1:2012 / A11:2014	Sicherheit elektrische Geräte für den Hausgebrauch und ähnliche Zwecke
EN 60335-2-103:2015	Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke – Besondere Anforderungen für Antriebe für Tore, Türen und Fenster
EN 62061:2005 + Cor.:2010 + A1:2013 + A2 :2015	Sicherheit von Maschinen – Funktionale Sicherheit sicherheitsbezogener elektrischer, elektronischer und programmierbarer elektronischer Steuerungssysteme
EN 61000-6-1:2007	EMV Fachgrundnorm – Störfestigkeit (Wohnbereich)
EN 61000-6-2:2005 / AC:2005	EMV Fachgrundnorm – Störfestigkeit (Industriebereich)
EN 61000-6-3:2007 / A1:2011 / AC:2012	EMV Fachgrundnorm – Störaussendung (Wohnbereich)
EN 61000-6-4:2007 / A1:2011	EMV Fachgrundnorm – Störaussendung (Industriebereich)

Angewandte nationale technische Spezifikationen:

EN 12453:2000 Abschn. 5.2	Nutzungssicherheit kraftbetätigter Tore – Anforderungen Kapitel 5.2 Antriebssysteme und Energieversorgung
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Bevollmächtigter für die Zusammenstellung der relevanten technischen Unterlagen:

Weilburg, den 29.05.2017

Dirk Schäfer
 Technischer Leiter / Technical Director
 CONTROLLER & SENSORS (VTM)

Eine Prüfung des Maschinentyps auf Übereinstimmung mit den Anforderungen der EG-Maschinenrichtlinie erfolgte durch die

TÜV NORD CERT GmbH Essen,
 Zertifizierungsstelle Maschinen / Certification Body Machinery
 Langermarckstraße 20, D-45141 Essen, Notified Body ID. No.: 0044
 Reg.-No.: 44 205 13132610

Diese Prüfstelle ist zuständig im Sinne von Anhang XI der EG-Maschinenrichtlinie.

Die technische Dokumentation ist am Firmenstandort Weilburg archiviert.

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine Zusicherung von Eigenschaften. Die mitgelieferte Produktdokumentation und insbesondere die darin enthaltenen Sicherheitshinweise sind zu beachten.

Die Inbetriebnahme der Torsteuerung wird so lange untersagt, bis diese an ein Tor angebaut wurde und dieses Tor den Bestimmungen der EG-Maschinenrichtlinie entspricht.