FEIG controller

Assembly instructions
Installation, commissioning, utilization and maintenance

TST FUE / FU3E

<u>Attention</u> 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 ATENCIÓN INDICACIONES IMPORTANTES DE SEGURIDAD!
Deben seguirse las indicaciones detalladas en página 3 de estas instrucciones de montaje.

Baujahr

2011

Notes

Version: 2012-02-10

This edition replaces all earlier versions.
The specifications in this document are subject to change without notice.

This Manual is directed especially at persons involved with commissioning the TST FUE / TST FU3E 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 gate 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. 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. FEIG ELECTRONIC GmbH assumes no liability for the proper operation of the equipment in third-party environments.

FEIG ELECTRONIC GmbH provides no warranty that the information in this document is not subject to foreign copyrights. By furnishing this document, FEIG ELECTRONIC GmbH does not grant any licenses to its own or foreign patents or any other intellectual property rights.

Only the direct contracting parties shall be entitled to warranty claims against FEIG ELECTRONIC GmbH; warranty claims are non-transferable. The warranty covers only products supplied by FEIG ELECTRONIC GmbH. There are no express warranties except as listed above.

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.

⚠ Attention

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

⚠

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

⚠ Warning

indicates that the controller is at risk.

🛈

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

DE   ACHTUNG! WICHTIGE SICHERHEITSANWEISUNGEN!
Für die Sicherheit von Personen ist es wichtig diesen Anweisungen Folge zu leisten. Diese Anweisungen sind aufzubewahren.
Diese Montageanleitung finden Sie im Downloadbereich unter www.feig.de. Bitte loggen Sie sich mit folgenden Zugangsdaten ein: Username: Download / Password: feig

GB   ATTENTION! IMPORTANT SAFETY INFORMATION!
These instructions must be observed to ensure personal safety. Store these instructions safely.
These installation instructions are available from the download area at www.feig.de. Please sign in with the following details: Username: Download / Password: feig

FR   ATTENTION! IMPORTANTES INDICATIONS DE SÉCURITÉ!
Pour la sécurité des personnes, il est important de respecter les consignes en question. Les présentes consignes doivent être conservées en lieu sûr.
Les instructions de montage sont téléchargeables dans la zone téléchargements de www.feig,de. Prière de vous logger avec les données suivantes: Nom d'utilisateur : Download / Mot de passe: feig

IT   ATTENZIONE! INDICAZIONI SULLA SICUREZZA IMPORTANTI!
Per la sicurezza personale è importante attenersi scrupolosamente a queste indicazioni. Queste indicazioni vanno conservate.
Le presenti istruzioni di montaggio sono disponibili nell'area download del sito www.feig.de. Effettuare il login con i seguenti dati d'accesso: Nome utente: Download / Password: feig

ES   ATENCIÓN INDICACIONES IMPORTANTES DE SEGURIDAD
Para la seguridad de las personas es importante seguir estas indicaciones. Deben guardarse estas indicaciones.
Puede encontrar estas instrucciones de montaje en el área de descarga en www.feig.de. Se ruega iniciar sesión con los siguientes datos de acceso: Nombre de usuario: Download / Password: feig

NL   LET OP! BELANGRIJKE VEILIGHEIDSINSTRUCTIES!
Voor de veiligheid van personen is het belangrijk om deze aanwijzingen op te volgen. Deze aanwijzingen dienen bewaard te worden.
Deze montagehandleiding kunt u vinden als download op www.feig.de. Gelieve de volgende toegangsgegevens te gebruiken: gebruikersnaam: Download / wachtwoord: feig

Inhalt

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. The control system **TST FU3E** is designed to handle electrical induction motors with a power consumption of up to 5 kW and a 400 V supply. The control system TST FUE is designed to handle electrical induction motors with a power consumption of up to 1.5 kW and a 230 V supply A fully integrated frequency converter with power output stage can gently control the door with variable opening and closing speeds.

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. photoelectric beams, 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 SVEK: plug-in module for inductive loop detection
    - TST RFUxE: Input / output expansions incl. ports for lockage applications, etc.
    - TST LCD/Klartext: clear text display with 2 x 16 characters
    - TST SURAx: Safety edge evaluation board
    - TST SUKS-A: Safety edge evaluation board
    - TST FSx: wireless Security System

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 gates or at the intended doors or drive units. 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.

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.

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.

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 motors terminal board.
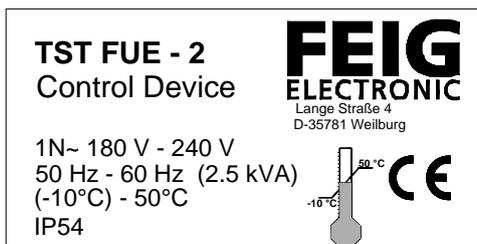
<u>**Type label**</u>　　　　　　　　　　　　　　　　**Warning notice label (example)**

Year of manufacture:
Serial No.:

Year of manufacture:
Serial No.:

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.
- 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 sight glass. Damaged keypads and sight glasses 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 chips 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 a main switch is installed. The main switch and the CEE-plug must be within easy reach.
- 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 photoelectric beam 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 pulses.
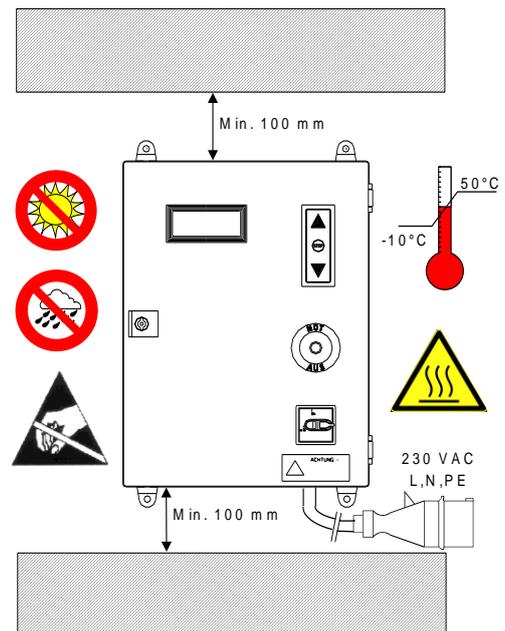
Fig. 1: Installation of the controller
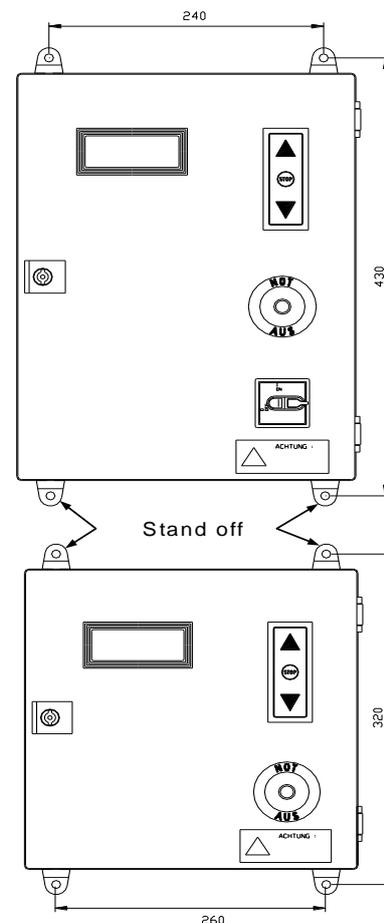
Fig. 2: Hole pattern

4   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 guidelines".
- 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 motors 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 is 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 intermediate circuit capacitors for up to five minutes after power has been turned off. The discharge time until voltages fall below 60VDC 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 intermediate circuit 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 sight glass. Damaged keypads and sight glasses 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! You must disconnect all supply circuits before opening the housing to access 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 photoelectric beam are defeated.

⚠ Warning

- Parameter settings and the speed as well as the operation of the safety devices must be checked. Die Einstellung der Parameter, Brücken und anderer Bedienelemente darf nur von unterwiesenem Personal durchgeführt werden.
- 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 24V 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 lineMaximum cable length: 30 m.
- Fast running sectional doors 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.
- **Maximum connection diameters for the terminals on printed circuit boards:**

	single wire (rigid)	fine wire (with/without wire end ferrule)	Max. tightening torque [NM]
screw terminals	4	2,5	0,5
plug in terminals	2,5	2,5	0,5
motor terminals	6	4	0,5
Line supplies	6	4	0,5

4.1 Power supply connection

4.1.1 TST FU3E
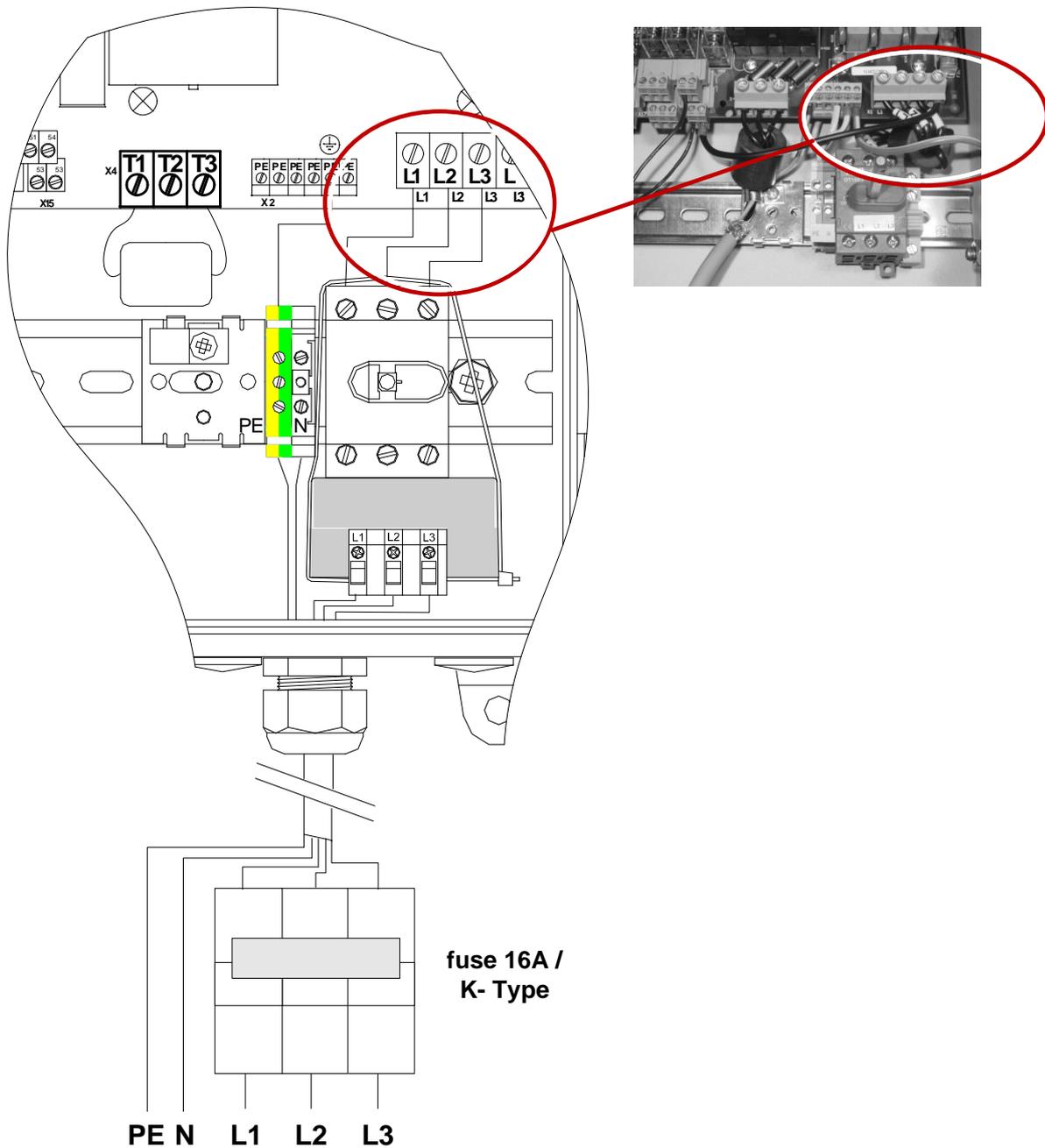
Fig. 3: Connecting the power cable TST FU3E

4.1.2 TST FUE

- Place 5 windings of each L and N conductor through the ferrite core
- Move the ferrite core directly next to the cable gland
- Connect wires L and N to the main switch
- The PE conductor must be connected directly to PE without it being wound through the ferrite core.
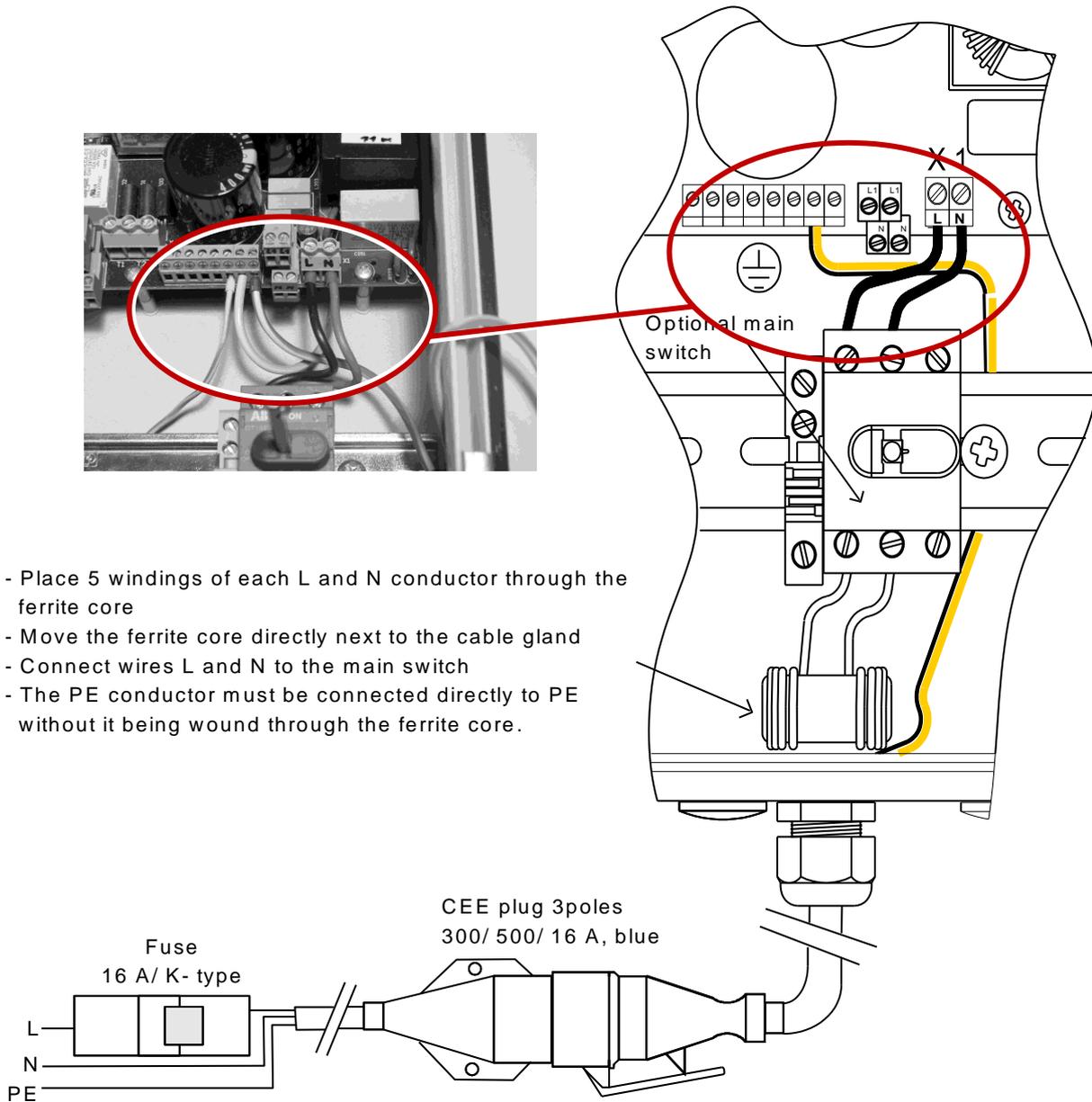
Fig. 4: Connecting the power cable TST FUE

⚠ **Warning**

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

4.2 Motor and brake connections

4.2.1 TST FU3E

Clamp shielding of the motor cable under PE clip

Connection example: brake according to open circuit current principle

control line including brake connection and limit switch connection

Shielding of the motor cable

The wire strap providing transport protection to the toroidal core must be removed before installing the motor cable.

PE U V W

M 3~

Brake rectifier

Fig. 5: Motor connection TST FU3E

⚠ **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.

4.2.2 TST FUE
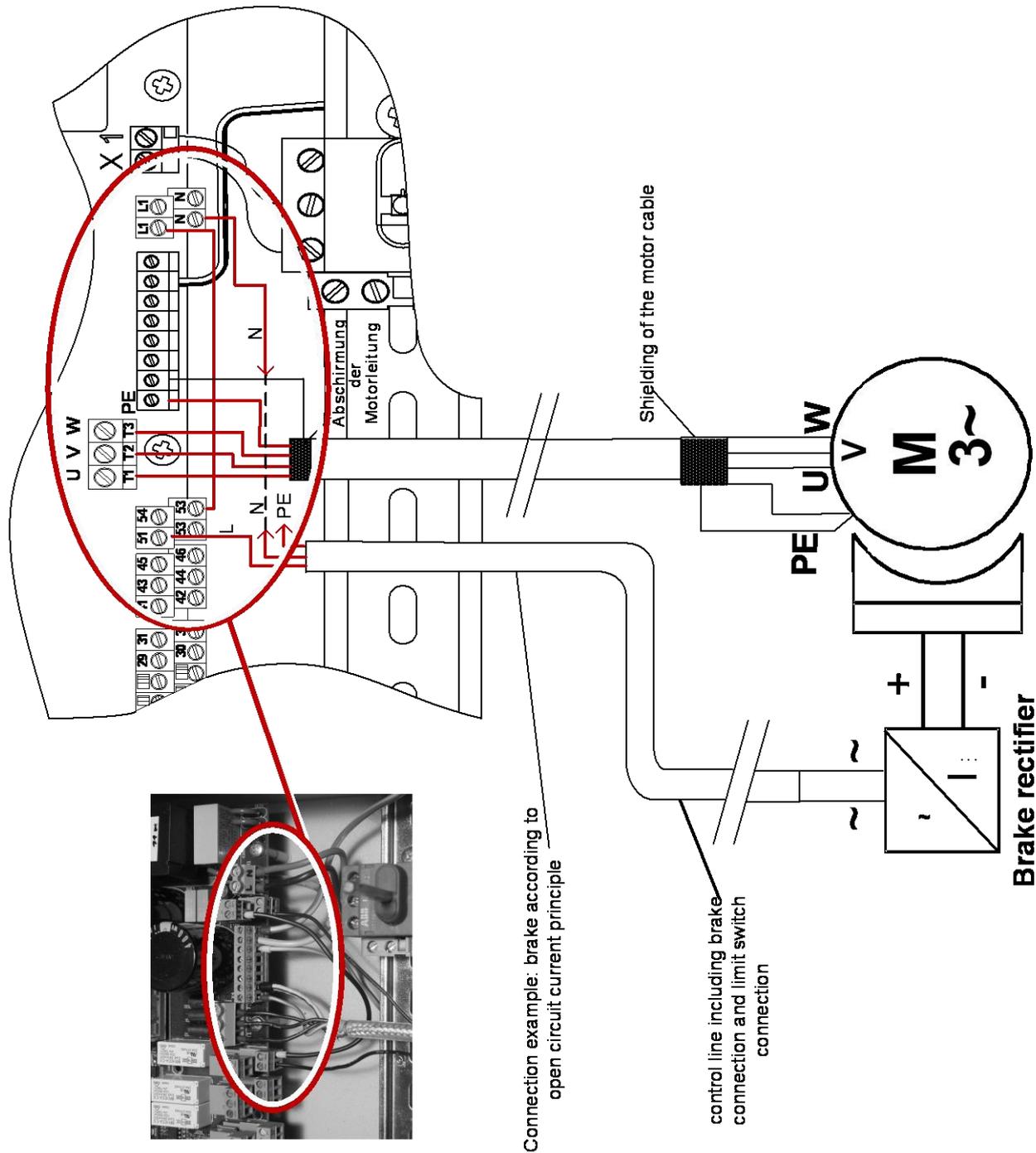
Fig. 6: Motor connection TST FUE

⚠️ **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.

4.3   Connection for safety edge

4.3.1   TST FU3E
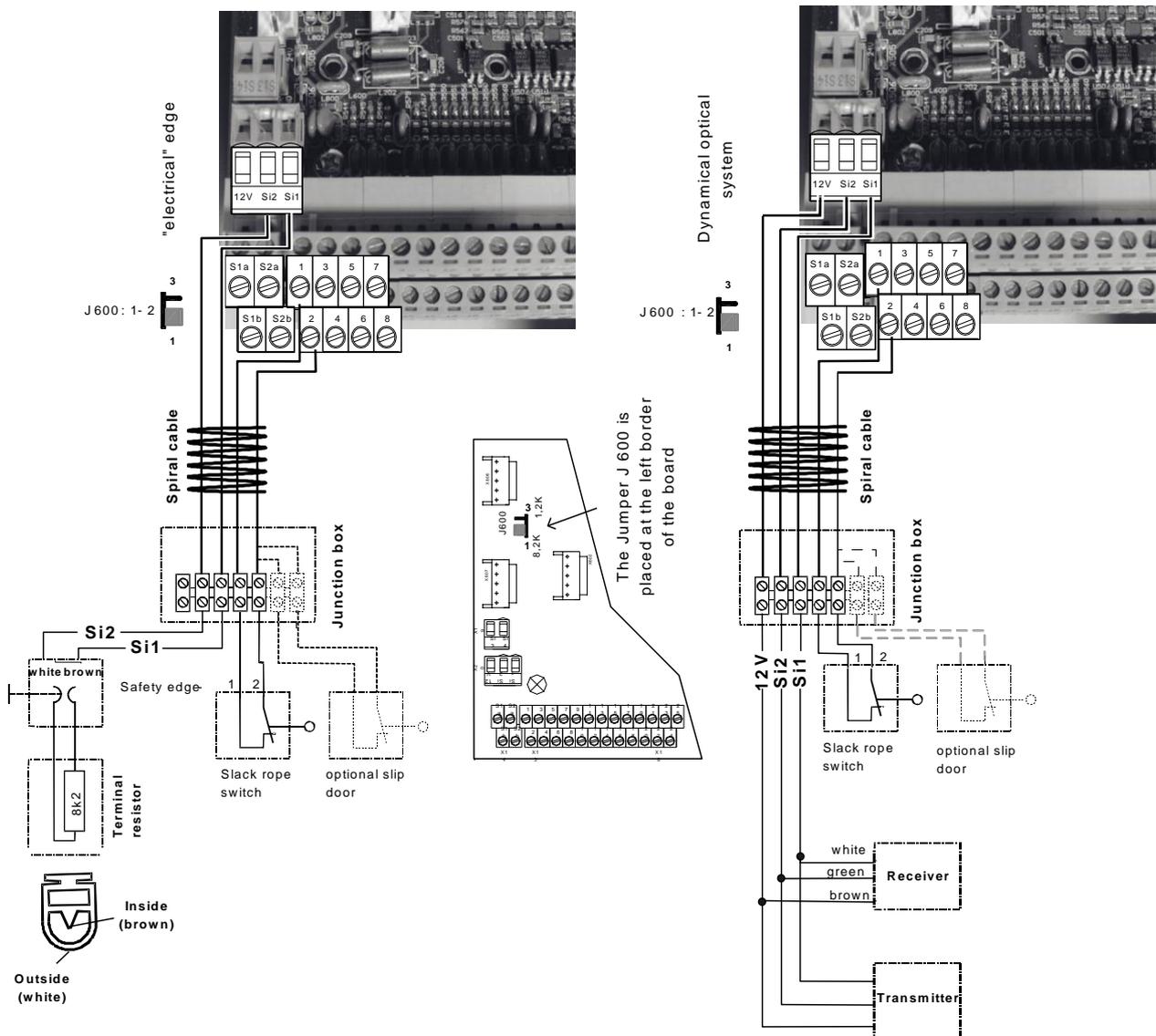
Fig. 7: Connection for safety edge TST FU3E

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 gate 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.

4.3.2 TST FUE
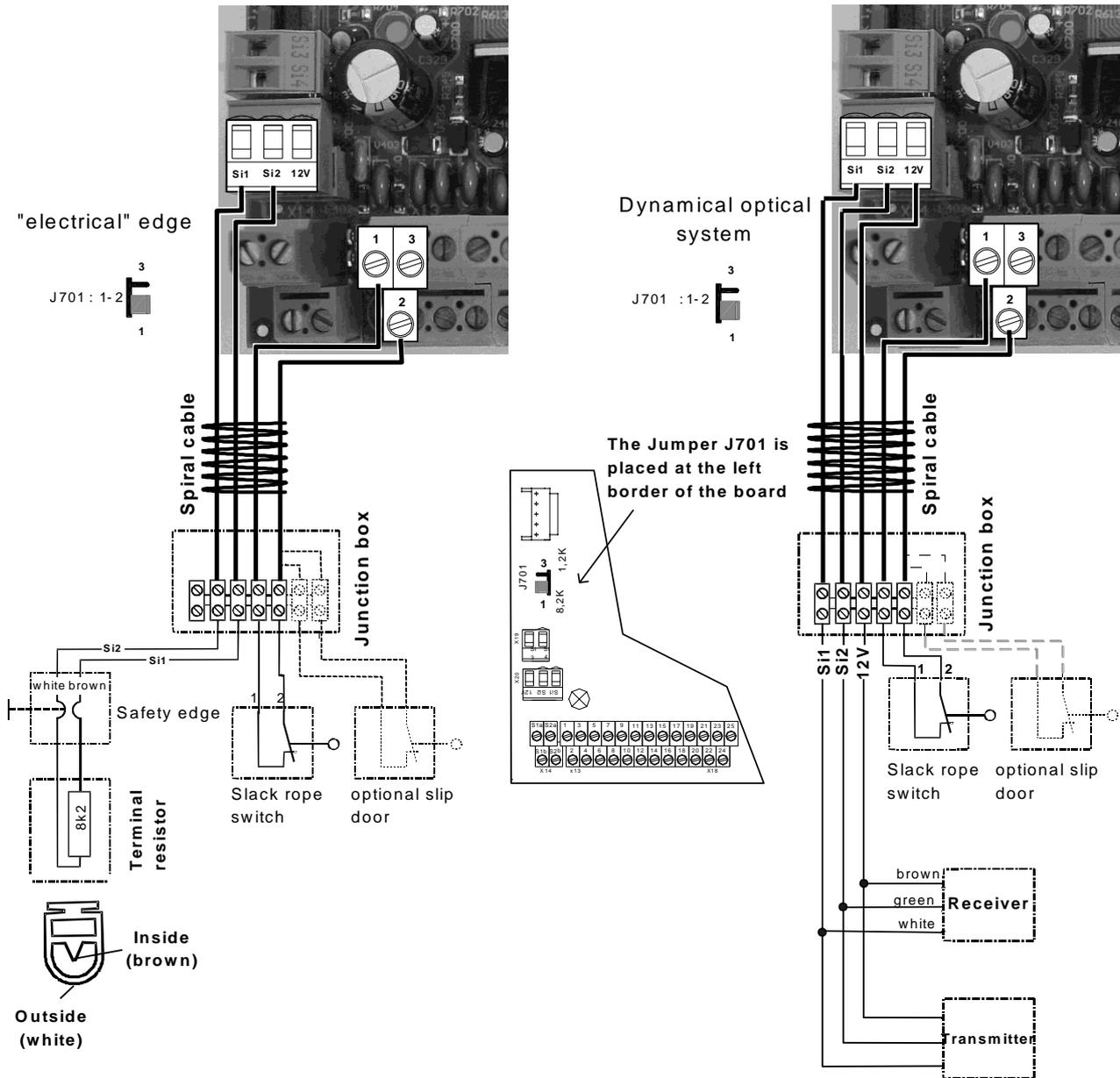
Fig. 8: Connection for safety edge TST FUE

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 gate 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.

4.4 Limit switch connection

Different limit switch systems can be used with the **TST FU3E or TST FUE** gate control system.
The default setting uses an absolute encoder as the limit switch. In addition, mechanical cam limit switches or incremental encoders may be used.

4.4.1 Absolute encoder TST PE FSB with WICAB system

Absolute encoder TST PE FSB is a single-turn encoder which is equipped with the WICAB radio system. The driving shaft must not execute more than a single revolution over the entire path of the gate.

The WICAB system can be employed to replace the spiral cable with a wireless link. For this purpose, a mobile unit FSBM TST must be mounted on the door leaf.
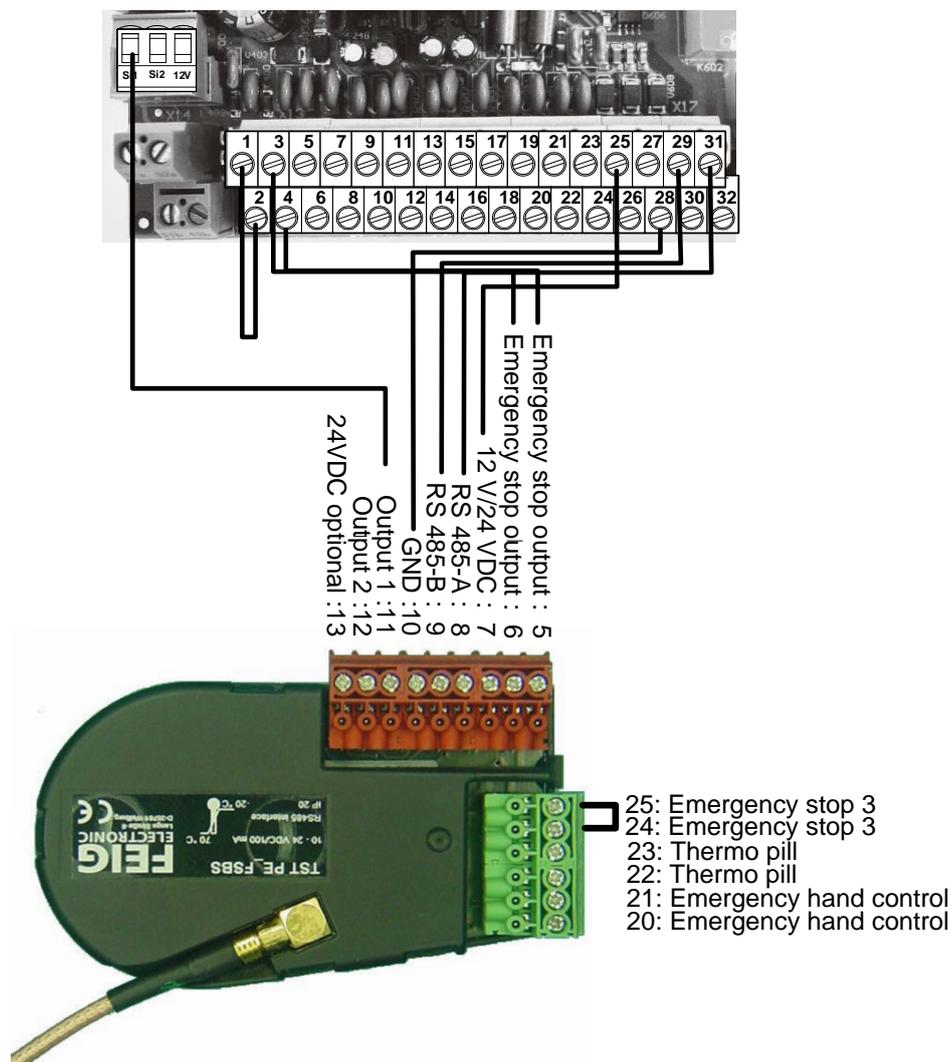
Fig. 9: Absolute encoder TST PE FSB

4.4.2 Absolute value 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 TSTPD FSAS and the mobile unit FSAM TST are required.

Wire 1: brown	→ **Terminal 27**
Wire 2: white	→ **Terminal 29**
Wire 3: blue	→ **Terminal 28**
Wire 4: black	→ **Terminal 31**
shield	→ **PE**
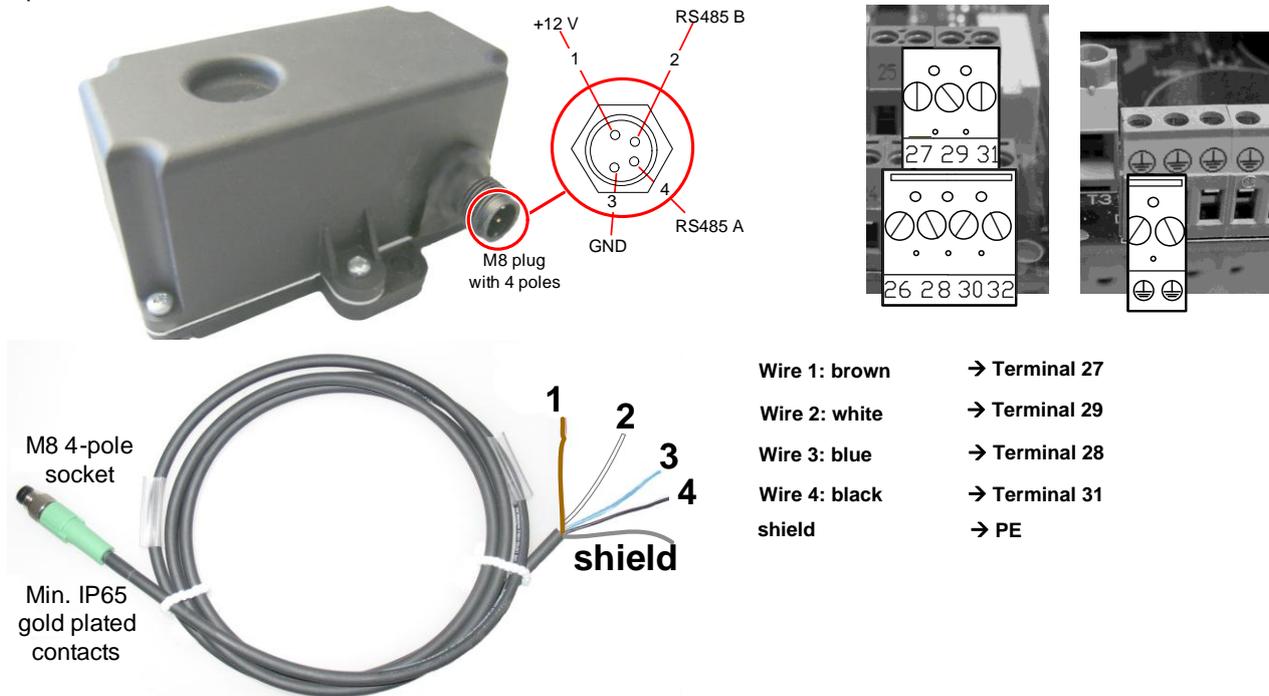
Fig. 10: Absolute value encoder TST PD

4.4.3 Absolute encoder DES

Wire 1: Emergency stop → Terminal 4
Wire 2: Channel B → Terminal 29
Wire 3: GND → Terminal 28
Wire 4: Channel A → Terminal 31
Wire 5: Emergency stop → Terminal 3
Wire 6: 12 VDC → Terminal 27
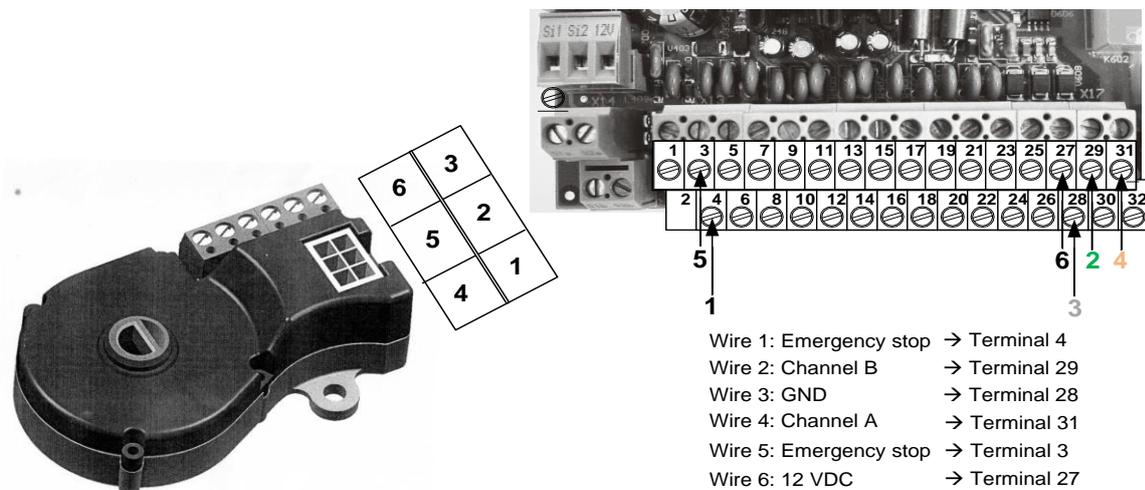
Fig. 11: Connection of absolute value encoder DES

4.4.4 Mechanical limit switches
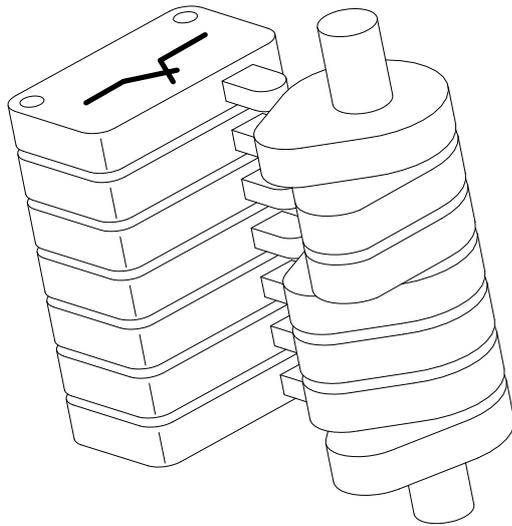
Fig. 12: Cam switch
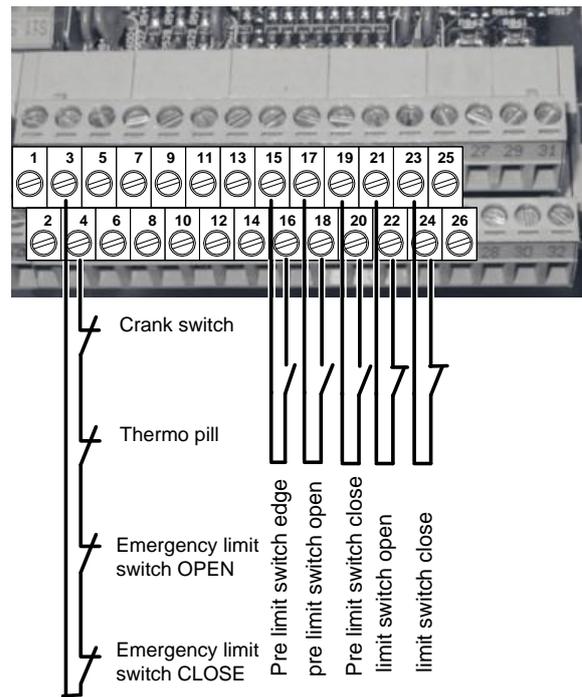
Fig. 13: Connecting cam switches

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

4.4.5 Incremental encoder

Fig. 14: Typical incremental encoder
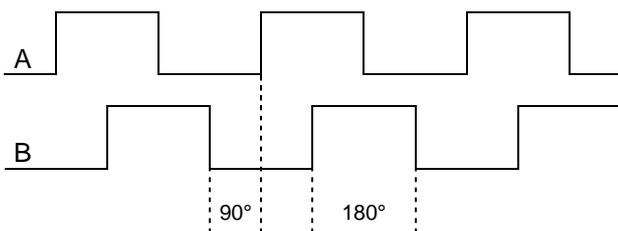
Fig. 15: Operation of an incremental encoder
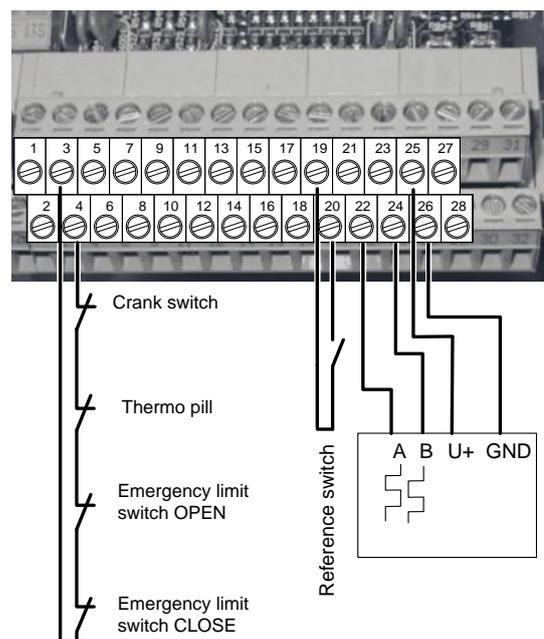
Fig. 16: Connecting incremental encoders

4.5   Photoelectric beam
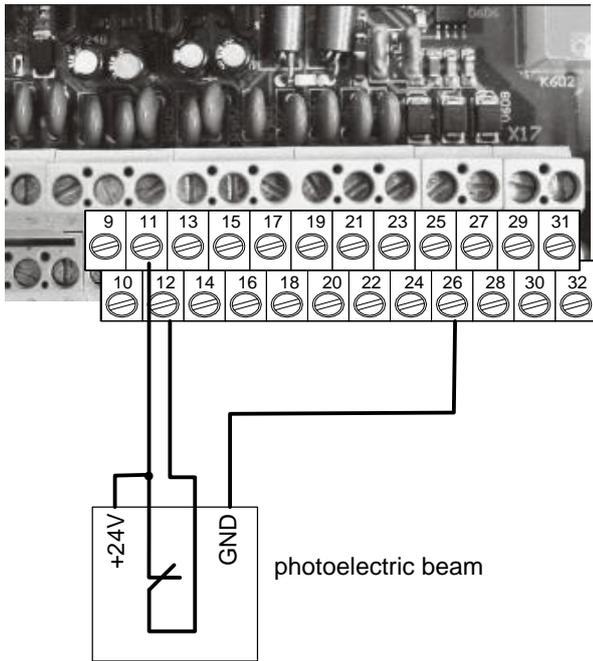
Fig. 17: Photoelectric beam connection

4.6   External triggering devices
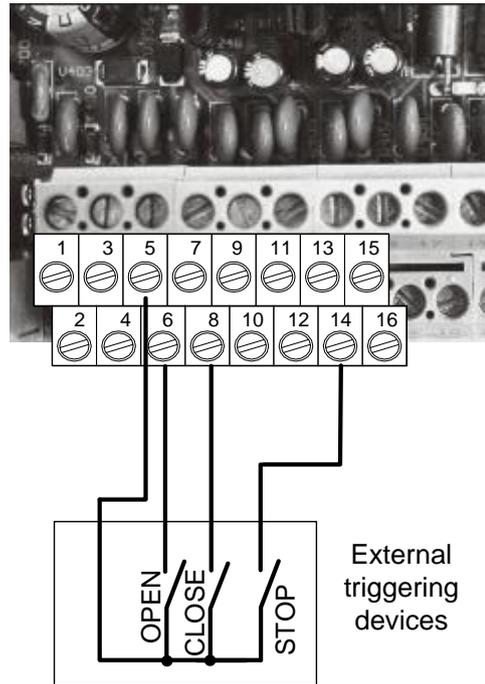
Fig. 18: External triggering devices

4.7   Traffic light connector TST FU3E

Constant green traffic light: relay active in position "Gate OPEN" P.704= 1281

blue

Bridge

L3

N

Flashing red traffic light: flashing during gate travel and during clearance time P.705= 1253
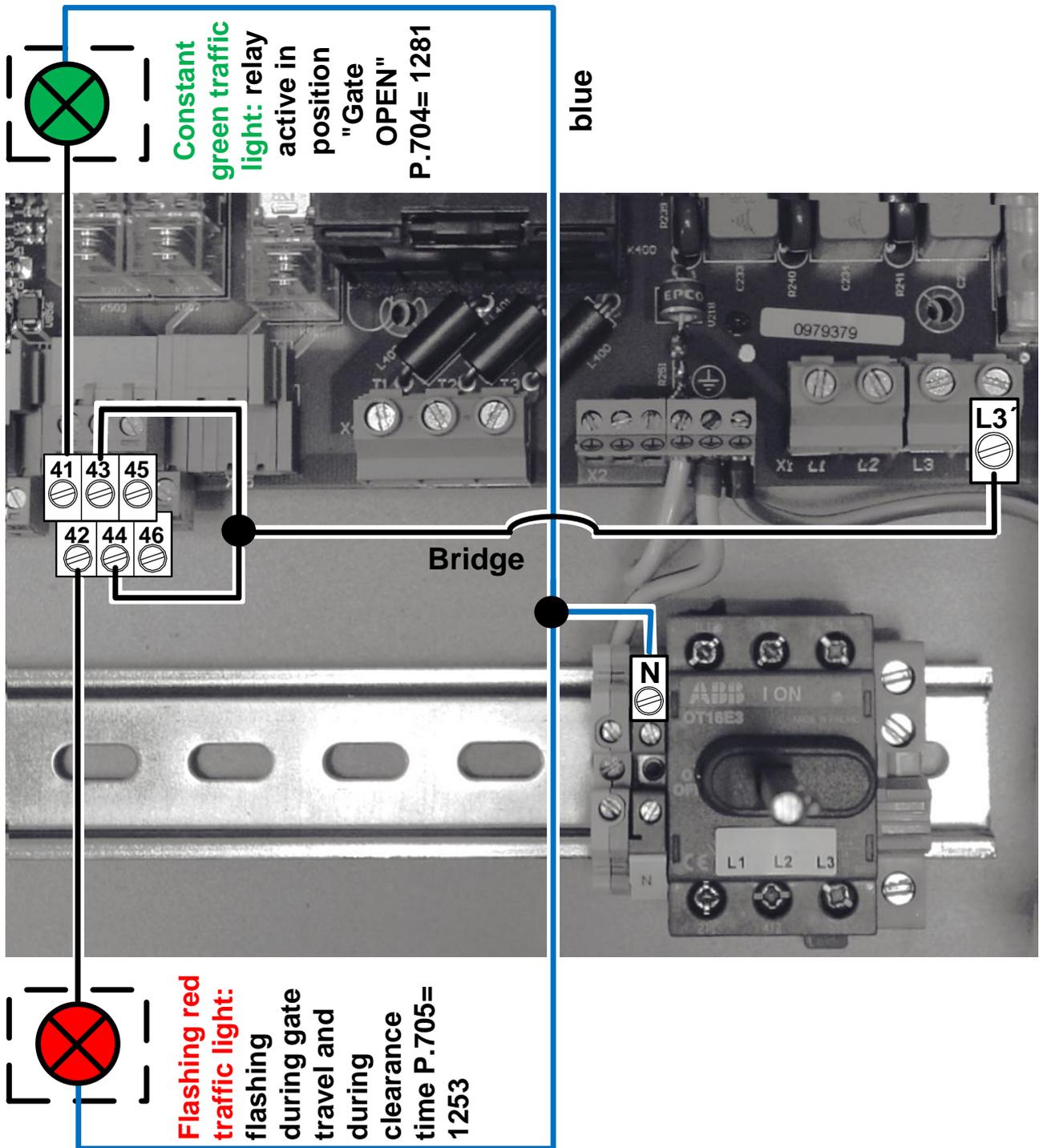
Fig. 19: Traffic light connector TST FU3E

4.8 Traffic light connector TST FUE
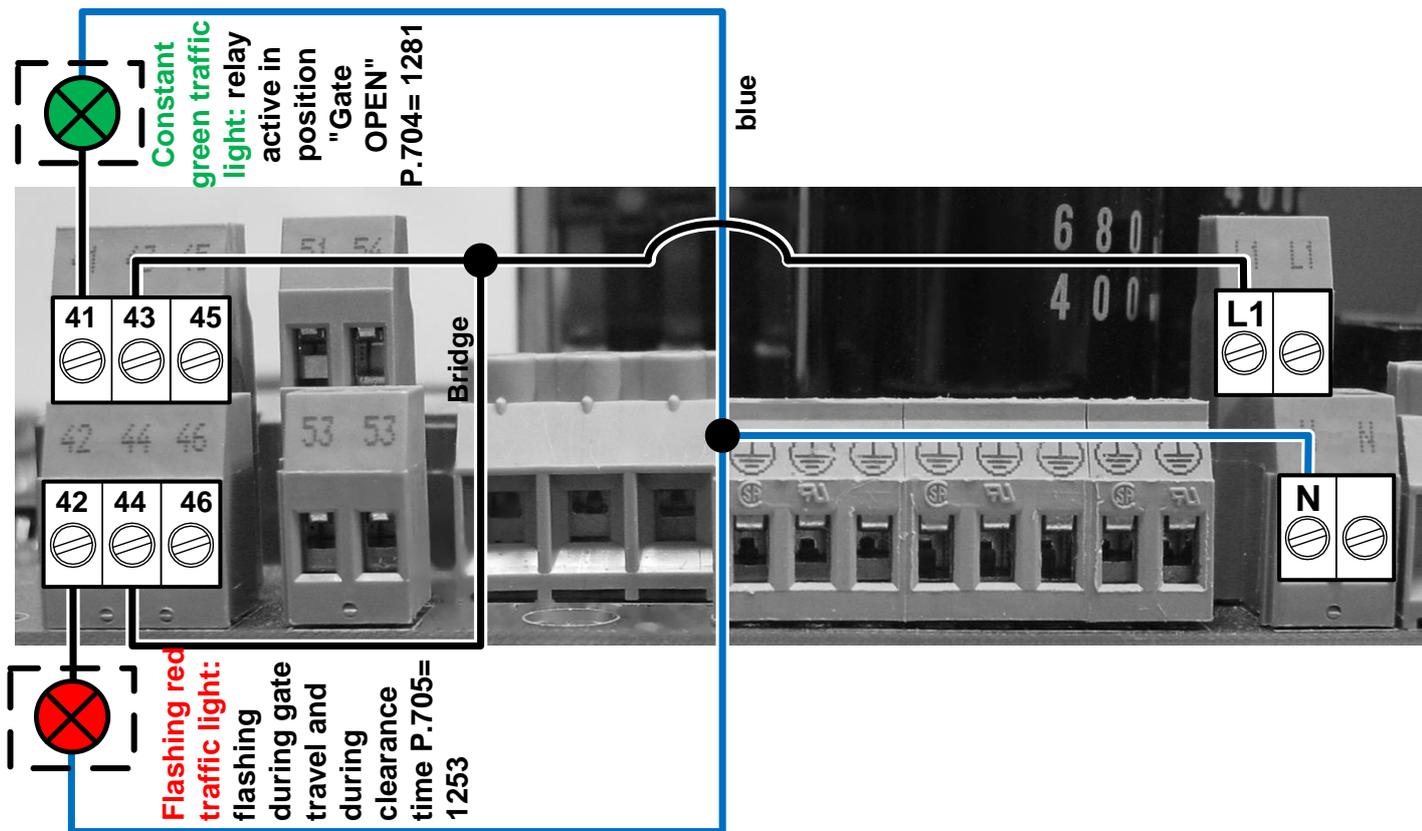
Fig. 20: Traffic light connector TST FUE

⚠️ **IMPORTANT, before you start the controller, check the electrical connection once more. Incorrect connections may damage the unit.**

5   Overview of inputs
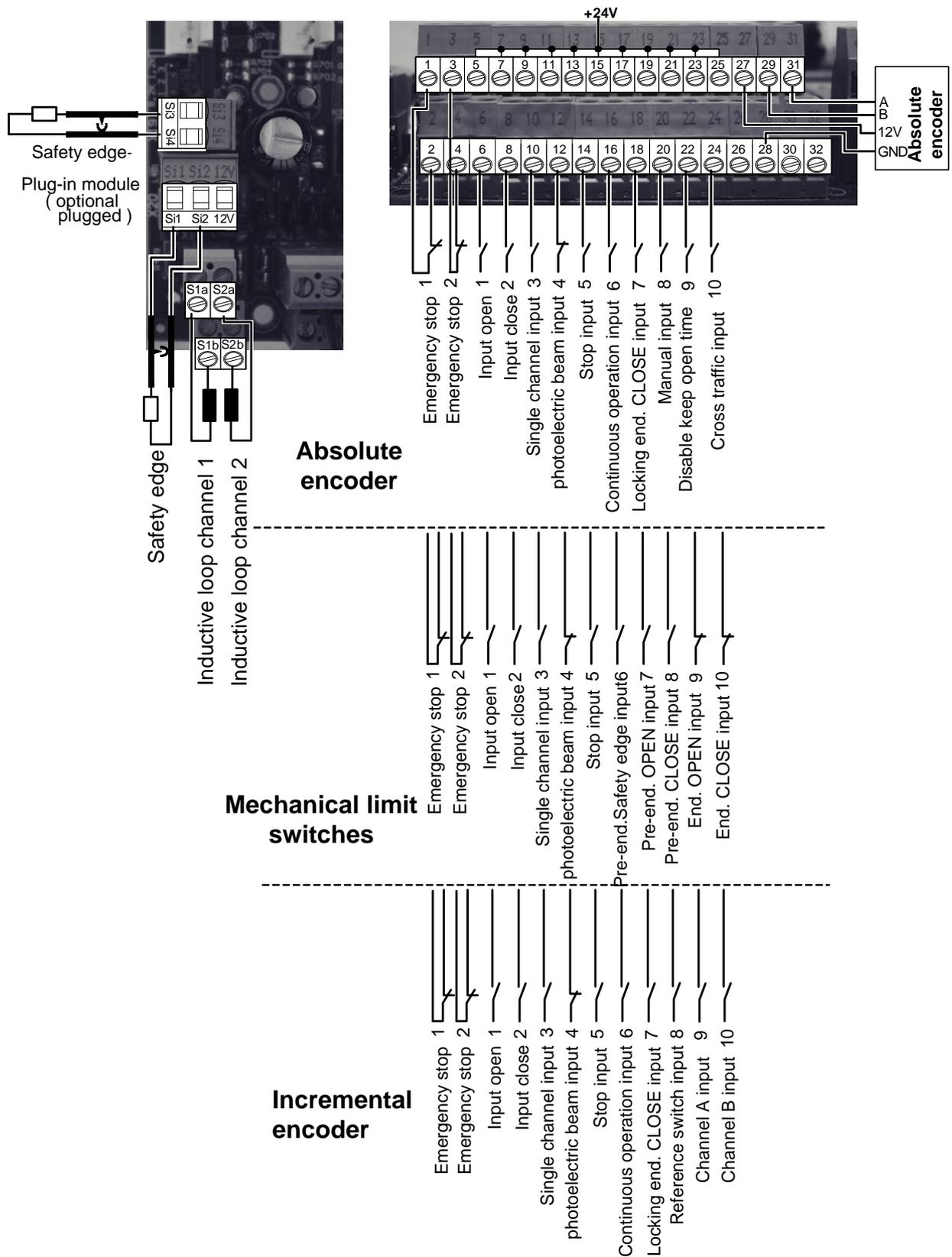
Fig. 21: Inputs

6   Overview of the relay outputs
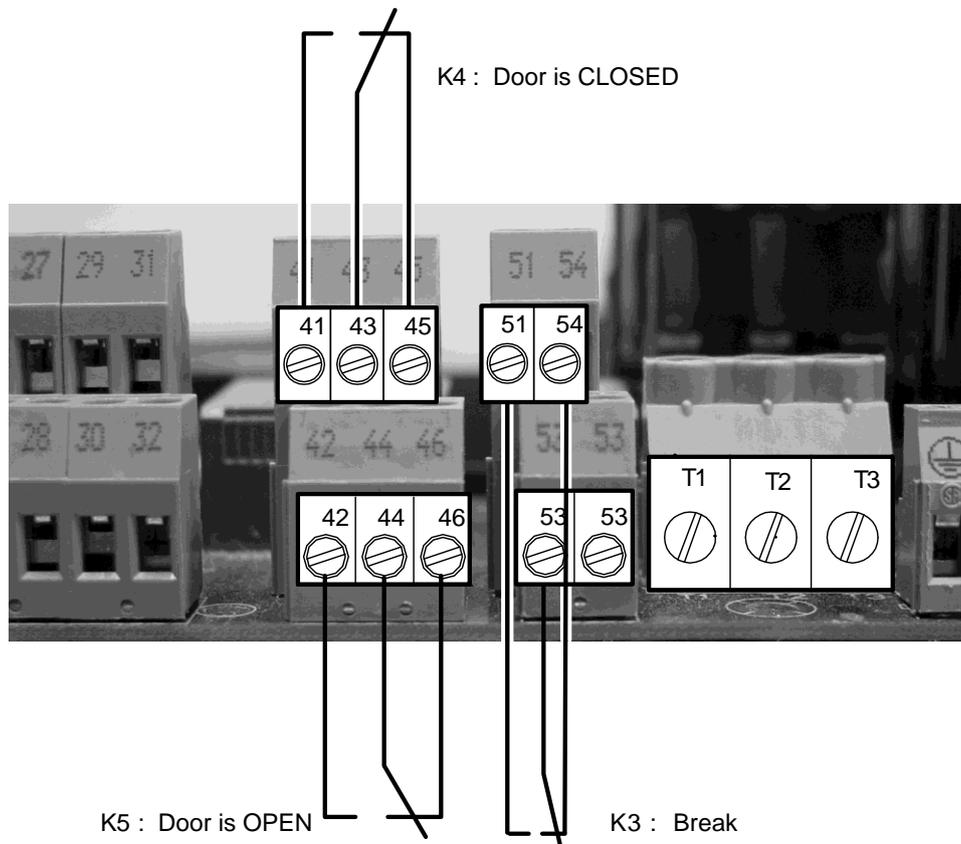
Fig. 22: Overview of the relay outputs

ℹ *Contrary to the mentioned standard settings, the relay function is selectable.*

7 General operating instructions to set parameters

7.1 Open the parameter operation mode

1. Turn off the gate controller and wait until the display has been completely extinguished.

2. Open the cover of the enclosure and switch the DIP switch (see illustration) to ON. The service mode is activated and you can close the cover.
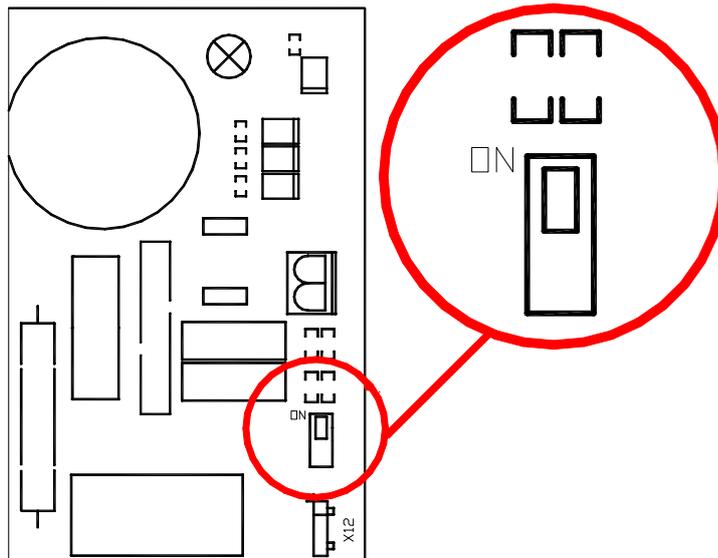
Fig. 23: DIP switch position

⚠ **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. press EMERGENCY STOP in order to change directly from travel operation to parameterization mode (the display will either show 1: plain text display or 2: 7-segment display).
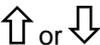
5. ⇧ or ⇩   Use the arrow keys to select the required parameter.

⚠ **Attention**

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

1. Plain text display	2. 7-segment display
P: Gate cycles | 000# 1234Zyk	P.000

P: Keep open1 | 010= 10 s	P.010

7.2   Editing a selected parameter

1. (STOP)   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: Keep open1 |	P. 0 10
010= 10 s	

P: Keep open1 |	10
010= 10✓s	

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: Keep open1 |	9*
010= 9?s	

3. (STOP)   - 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: Keep open1 |	10
010= 10✓s	

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

P: Keep open1 |	9
010= 9✓s	

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

P: Keep open1 |	P. 0 10
010= 9 s	

7.3   Exit from parameterization mode

P: Gate cycles |	P. 000
000 234Zyk	

(NOT STOP)   Pull out the EMERGENCY STOP button to exit from parameterization mode.

Tor steht	5ГOP
xxx	

7.4   Execute a reset

(STOP) + ⇧ + ⇩   press simultaneously and keep pressed for approx. 3 seconds.

7.5   Entry into the extended parameter configuration mode

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

P: Password | 99<u>9</u>= 0001 #	P.999

P.999 = 2 (extended commissioning mode)

P: Password | 999= 000<u>1</u>✓#	0 0 0 1

P: Password | 999= 000<u>2</u>?#	0* 0* 0* 2*

P: Password | 999= 000<u>2</u>✓#	P.999

8   Basic settings

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

8.1   Automatic retrieval of basic data

If the controller is not already preconfigured by the gate manufacturer, the following parameters are acquired automatically:

⚠️   **The DIP switch must have been turned on (see position DIP-switch figure Fig. 23: DIP switch position) so that the controller can acquire parameters automatically.**

ℹ️   *For the operation of the controller, see chapter: 7 General operating instructions for the parameterization*
The basic data does not require changes when they were previously retrieved and set automatically. See chapter 7 (General operating instructions to set parameters).
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 forced.

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

P.205: 0   = Mechanical limit switches Version 1 (Fig. Fig. 12: Cam switch: connecting cam switches)
P.205: 1   = Mechanical limit switches Version 2 (limit switches and pre-limit switches are normally closed)
P.205: 2   = Incremental encoder as limit switch
P.205: 3   = Absolute encoder DES-A
P.205: 4   = Absolute encoder TST PB-A
P.205: 5   = SSI encoder (only with UL-Version)
P.205: 6   = reserved
P.205: 7   = Absolute encoder DES-B (Kostal)
P.205: 8   = Absolute encoder TST PD / TST PE

Reference switch profile P.25F
If an incremental encoder is used as a limit switch, you must use Parameter P.25F to define a reference switch type and the behavior of the controller after power-up.

P.25F: 0 =   Move to the lower limit position and save this.
P.25F: 1 =   After power-up, the system automatically synchronizes with the lower reference switch.
P.25F: 2 =   After power-up, the system automatically synchronizes with the safety edge.
P.25F: 3 =   After power-up, the system automatically synchronizes with the upper reference switch.
P.25F: 4 =   After power-up, the system automatically synchronizes to an upper mechanical stop.
P.25F: 5 =   After power-up, the system automatically synchronizes to the safety edge and then to an upper mechanical stop.
P.25F: 6 =   After power-up, the system automatically synchronizes to the safety edge and then to an upper reference switch.
P.25F: 7 =   After power-up, the system automatically synchronizes to an upper reference switch and then to an upper mechanical stop.
P.25F: 8 =   After power up, automatic synchronization with the upper mechanical stop and then with the lower mechanical stop
P.25F: 9 =   After power up, manual synchronization must be performed with the lower mechanical stop and then with the upper mechanical stop

Motor data P.100 – P.103

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

P.101:Motorcurrent

P.102: Cos φ

manufacturer

Type designation

| 0,5 KW | 50 Hz |

Δ / Y 2,4 / 1,4 A   Δ / Y 230 / 400 V

cos φ 0,85   Iso.Kl.: F

IP 55

P.100: Nominal motor frequency

P.103: Nominal motor voltage
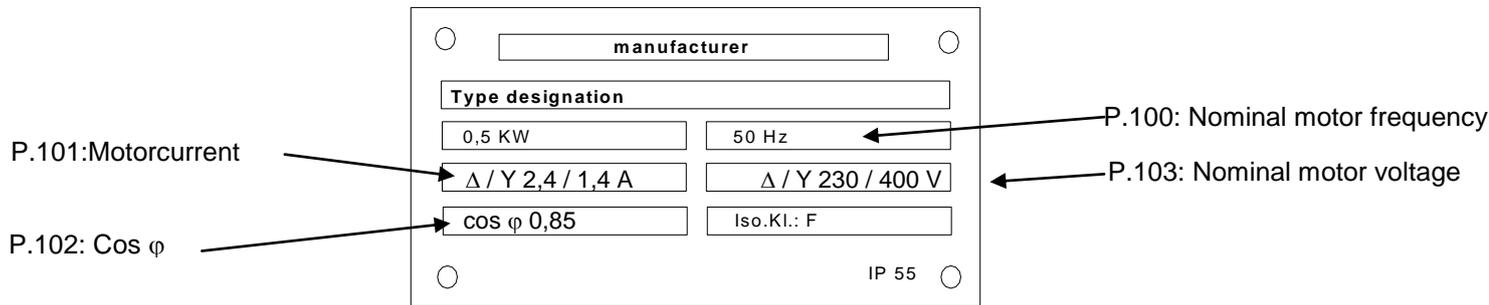
Fig. 24: Typical motor nameplate (may vary)

⚠ **Be sure to note the Y/D wiring of the motor. The motor data must be entered in accordance with the motors wiring.**

L1 L2 L3

U1 V1 W1

W2 U2 V2

Star wiring

L1 L2 L3

U1 V1 W1

W2 U2 V2
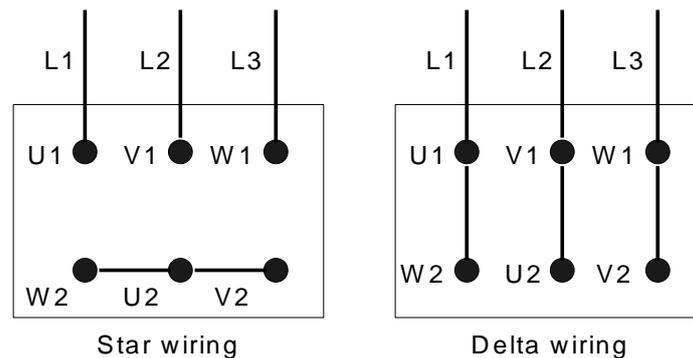
Delta wiring

Fig. 25: Star/Delta wiring

ℹ *The automatic retrieval 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 routine.*

9   Commissioning…

⚠ **Warning**

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

ℹ 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) STOP key.	!Calibration! Start with ⬩ / E!CH

2. Move the gate to the ⇩ CLOSE position with the membrane keypad CLOSE and

⚠ **If the gate moves in the incorrect direction: incorrect motor rotary field, turn off controller and reverse the 2 motor connections.**
If the gate does not move, the motor lacks power. The power to the motor can be increased by using the Boost option (increased power at low speed) (see Chapter Fehler! Verweisquelle konnte nicht gefunden werden.**), if necessary, check that the brake was released.**

3. save by pressing the (STOP) STOP key for approx. 3 seconds.	For the close position → ⇧⇩ 0 Apply with ⬩ / E* ı* E* u*

4. Move the gate to the OPEN position by means of membrane keypad ⇧ OPEN and	For the open position → ⇧ xxx Apply with ⬩ / E* ı* E* o*

⚠ **If the gate does not move, the motor lacks power. The power to the motor can be increased by using the Boost option (increased power at low speed) (see Chapter** Fehler! Verweisquelle konnte nicht gefunden werden.**), if necessary, check that the brake was released.**

5. save by pressing the (STOP) STOP key for approx. 3 seconds.

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

	Open position OK / ¯* Eo¯
6. Press ⇩ briefly, the gate moves down and is now taught in its position.	Gate closes I.555 teaching travel / I.555
	Close position OK / _*Eu_
7. Now press ⇧ repeat the process until the correction travel has completed. (Display I.510 = OK)	Tor Gate opens I.515 correction travel / I.515
	I.510 correction OK / I.510
	Gate opens / ºRUF
	Gate closes / 2*UFº

9.2   … with mechanical limit switches

1.   Press the ⇩ CLOSE-key to move the gate to a distance of approx. 50cm from the closed position

⚠️ **If the door does not move, the motor lacks power. The power to the motor can be increased by using the Boost option (see chapter** Fehler! Verweisquelle konnte nicht gefunden werden.**), 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 gate 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

   Press the ⇩ CLOSE-key to move the gate to a distance of approx. 10cm 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.**

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

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

4.   Press the ⇧ OPEN-key to move the gate to a distance of approx. 50cm from the opened position

⚠️ **If the door does not move, the motor lacks power. The power to the motor can be increased by using the Boost option (see chapter** Fehler! Verweisquelle konnte nicht gefunden werden.**), 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.**

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

6. Press ⇧ OPEN-key to move the gate to approx. 10cm 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.**

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

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

8. If required by the door type: adjust upper and lower EMERGENCY limit switches.

9.   Press (STOP) STOP and ⇧ OPEN to enter parameterization mode and select Parameter P.980 "Service Mode", open and set parameter value "2" to "0" (Automatic mode).

10. 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 !

11. Connect the NC contacts, e.g. the safety circuit, in series with thermo pill.

9.3   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

9.4   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 overcurrent 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 parameterization mode by pressing the (STOP) STOP and ⇧ OPEN buttons 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) STOP and use the ⇧ ⇩ arrow keys to change it in

      small steps of max. 5, then save by pressing (STOP) STOP (longer).

4.   After changing the boost, exit parameterization mode by pressing the (STOP) 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 optimization for the gate

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
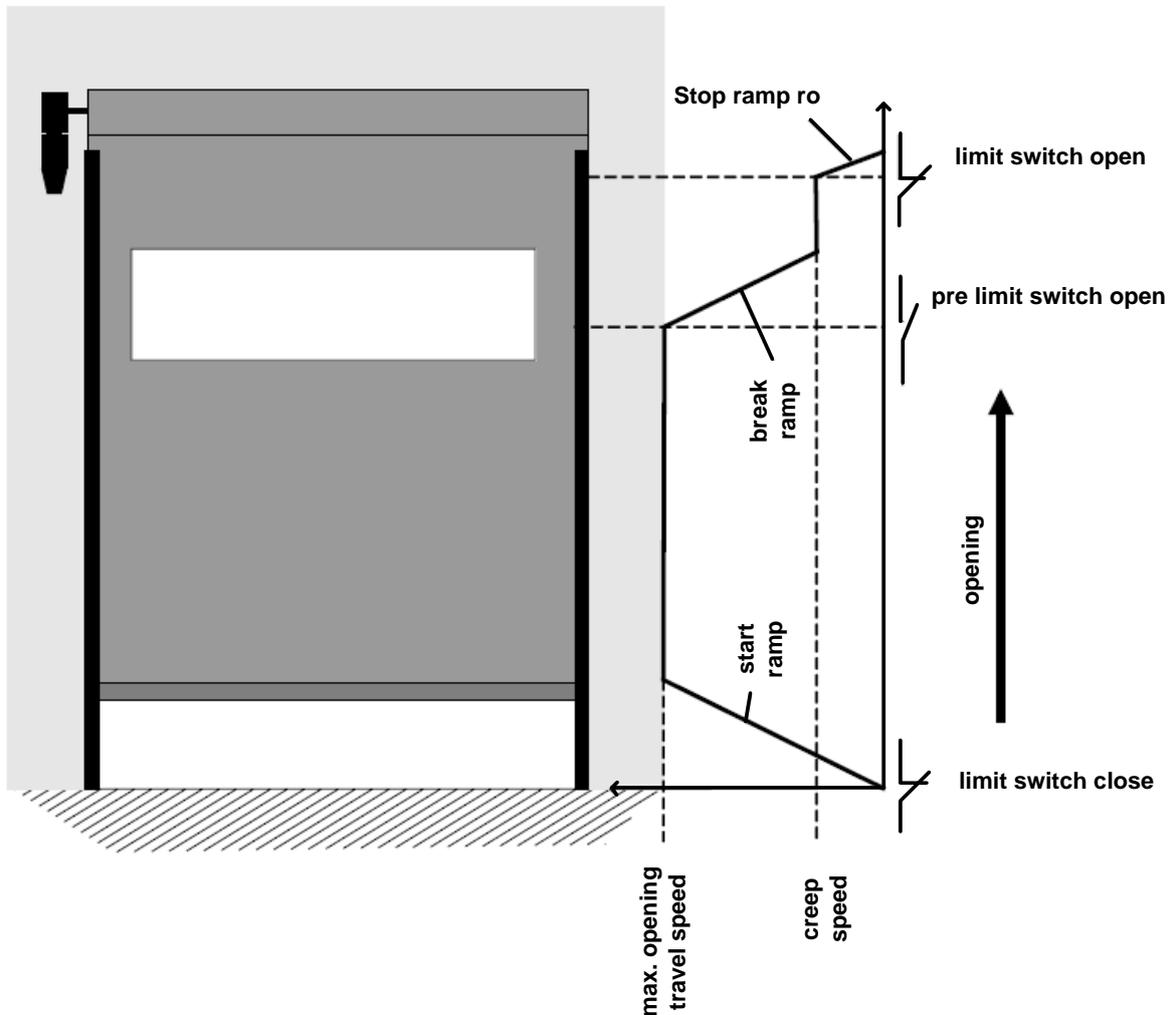
Fig. 26: Opening using frequency converter

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 the brake 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
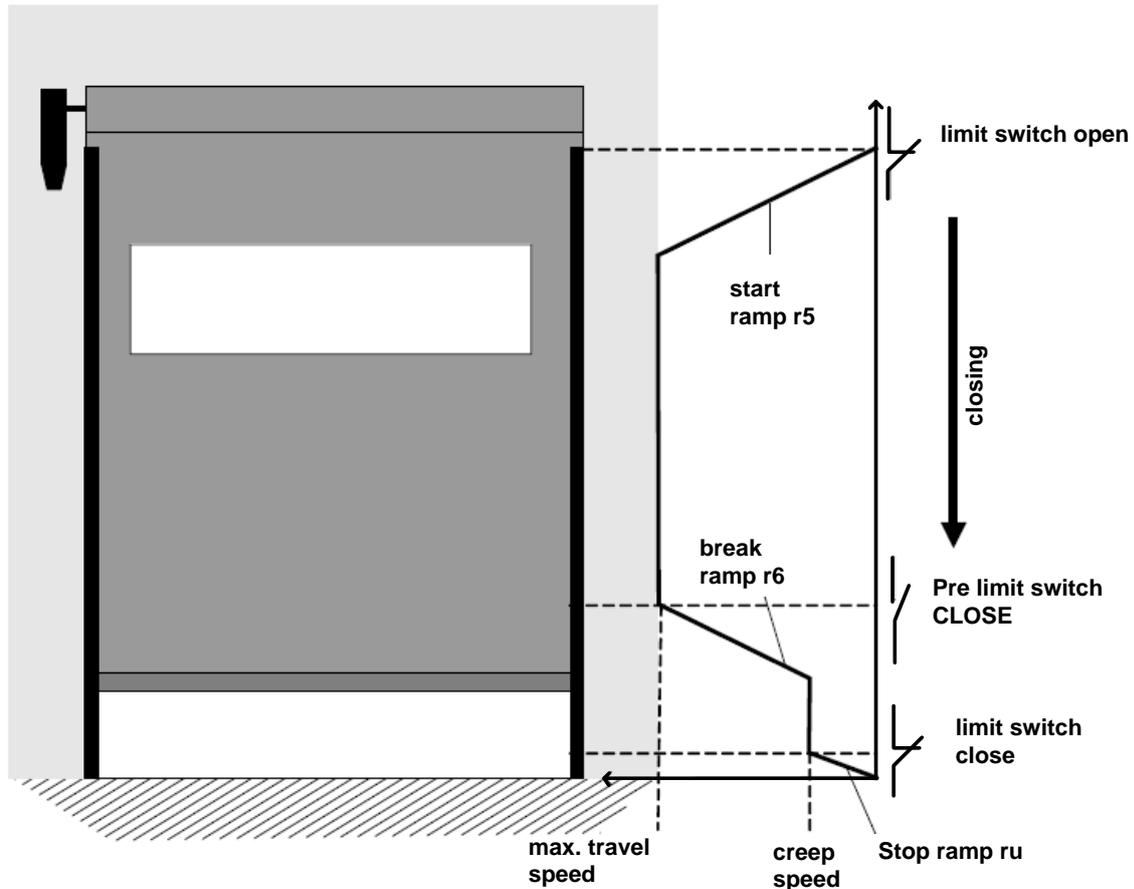
Fig. 27: Closing using the frequency converter

The frequency converter starts 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 the door is braked to the creep speed frequency 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 gate CLOSED absolute limit switchThe 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 gate OPEN absolute limit switch. 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.316 = 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 gate 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 gate. If the ramp is flatter the gate is braked or accelerated more gently.

P.311 / P.312 = Start ramp "r1": acceleration of the door from 0Hz 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 0Hz to closing speed.
P.361 / P.362 = Brake ramp "r2": deceleration of the door from closing speed to creep speed.
P.340 / P.342 = Ramp "r-STOP" for opening: deceleration of the door from opening speed to 0Hz after pressing a STOP key.
P.380 / P.382 = Ramp "r-STOP" for closing: deceleration of the door from closing speed to 0Hz 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.

10.6 Speed-distance profile

Parameter P.39F can be used to select profiles that pre-set the acceleration of the door. The parameter sets both the acceleration of the start ramp and of the brake ramp.

P.39F = 0: deactivated
P.39F = 1: slow acceleration of the door
P.39F = 2: medium acceleration of the door
P.39F = 3: fast acceleration of the door

11 Funktionen

11.1 Door Cycle Counter

P.	[Unit] Range	Function	Description/ Note
P.000	[Cycles]	cycle counter	The content of this parameter indicates the number of previously counted cycles.

11.2 Maintenance counter

P.	[Unit] Range	Function	Description/ Note
P.005	[Cycles]	Maintenance counter	The content of this parameter indicates the number of cycles remaining until maintenance is due. ⓘ *The setting -1 means that the maintenance counter has not yet been activated.*
P.973	0 ... 1	Resetting the maintenance counter	By setting this parameter to 1 the maintenance counter is reset.

11.3 Auto close times / Forced closing

ⓘ *Which Auto close time runs depends on the arrived end position and on the OPEN command used. For each OPEN command you can use Parameter P.5x4 to set separately whether and which Auto close time runs*
(X = Number of used input).

P.	[Unit] Range	Function	Description/ Note
P.010	[Seconds] 0 ... 9999	Auto close time 1	The door is held in the end position Gate OPEN for the set time. The door is then automatically closed.
P.011	[Seconds] 0 ... 9999	Auto close time 2	The door is held in the end position Intermediate Stop / Partial open for the set time. The door is then automatically closed.

11.4 Pre-warning time before door movement / Clearance time

P.	[Unit] Range	Function	Description/ Note
P.025	[Seconds] 0 ... 20	Pre-warning time before closing	The closing move is delayed following receipt of a CLOSE command or after expiration of the auto close time (forced close) by the time specified in this parameter.
P.026	0 ... 1	Pre-warning time before closing from between the end positions	By activating this parameter the pre-warning time runs always before closing, undependend from the input, also between end positions and not only in end position OPEN. The used time is set by P.025. 0: Pre-warning time set by input 1: Pre-warning time always active

11.5 Oncoming traffic

P.	[Unit] Range	Function	Description/ Note
P.892	0 ... 1	Oncomming traffic control	With this parameter the oncoming traffic function is activated. If activated the direction imformation of an open command (P.5x6) is used to control the traffic lights an the hold open time.

0: The oncomming traffic function is deactivated. The programmed direction with P.5x6 of relevant commands is not evaluated. Internal the direction is set to "both directions" (P.5x6 = 3).

1: The oncomming traffic function is active. The direction set by P.5x6 is evaluated. Traffic lights and hold open time are influenced by the used direction.

11.6 Motor settings

The motor ratings are used to teach the door controller what it needs to know about the motor used.

ℹ️ *The setting -1 means that this parameter is automatically queried during start-up of the door controller.*

P.	[Unit] Range	Function	Description/ Note
P.100	[Hz] 30 ... 200	Motor rated frequency	The motor rated frequency indicated on the nameplate is entered here.
P.101	[A] 0,0 ... 9,9	Motor rated current	The motor rated current indicated on the nameplate is entered here.
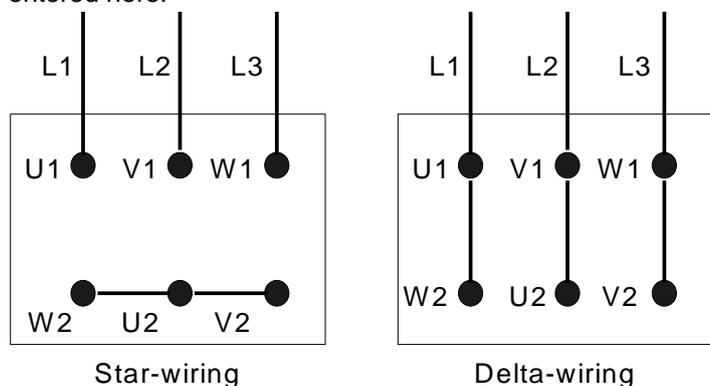
Figure 1: Star / Delta wiring

⚠️
Note Star / Delta wiring of the motor !

P.	[Unit] Range	Function	Description/ Note
P.102	[%] 40 ... 100	Power factor cos Phi	The power factor indicated on the nameplate is entered here.

⚠️
The entry is made without the leading "0".
63 thus means cos Phi 0.63.

P.	[Unit] Range	Function	Description/ Note
P.103	[Volt] 100 ... 500	Motor rated voltage	The motor rated voltage indicated on the nameplate is entered here. ⚠️ **Switching the motor windings to 400V operation makes no sense with 230 V supplied controllers, since they can output a maximum of 230V !** ⚠️ **Note Star /Delta switching of the motor ! (see Fig. In parameter P.101: Star / Delta wiring)**
P.110	0 ... 0	Drive profile	This profile is used to set the motor rated data for a known motor. 0: Manual setting of the motor rated data 🛈 *The exact settings which this profile involves can be found in Appendix: Drive Profile.*
P.130	0 ... 1	Motor rotary field	This parameter specifies the rotary field of the motor for OPEN move. 0: Right rotating 1: Left rotating

11.7 Boost

Boost is used to increase the power of drives in the lower speed range.

Either a too little or a too high boost setting can result in improper door movement. If too much boost is already set, this will result in an overcurrent error (F.510/F.410). In this case you must reduce the boost. If the boost is low or 0 and the motor still has insufficient force to move the door, you must increase the boost.

Due to the large number of possible door/gate types, the correct boost setting should be determined experimentally. The diagnostic function for motor current (see Parameter P.910) can be helpful here. By using the current indicator you can easily determine whether the changed setting has achieved the desired results.

ℹ️ *The boost should always be set as low as possible, but high enough to do the job.*

P.	[Unit] Range	Function	Description/ Note
P.140	[%] 0 ... 30	Boost for OPEN	The boost increases the output voltage and thus the power in the lower speed range until the cutoff frequency (P.100) is reached. The voltage is increased by the value in percent of the motor rated voltage (P.103) entered in the parameter.
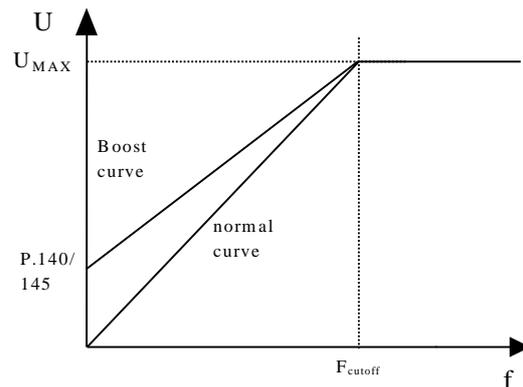
Figure 2: Boost characteristic

P.145	[%] 0 ... 30	Boost for CLOSE	see Parameter P.140

11.8 Frequency ramp stop function

The frequency ramp stop function makes it possible to move heavy doors.
The function monitors the current during door acceleration. The motor current is allowed to be max. double the rated current (P.101).
If the current is too high, the converter stops the door acceleration and continues to move at an even speed, so that the current drops, since energy for accelerating the door no longer needs to be provided.
If the current drops below the limit, the door continues accelerating.

P.	[Unit] Range	Function	Description/ Note
P.141	[Hz] 10 ... 200	Start frequency of the frequency ramp stop for OPEN	Here the starting point for the frequency ramp stop function is set. Below the set frequency the function is deactivated. The current may then rise above the limit of 2x the motor rated current (P.101). This is possible for a short time, but for longer travel will result in an overcurrent error (F.410 or F.510).
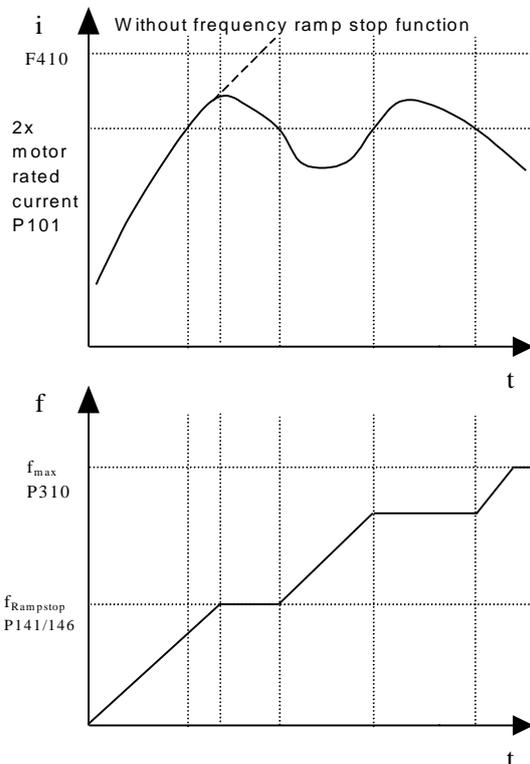
Figure 3: Frequency ramp stop characteristic curve

🛈 *A setting of 200 deactivates the function*

P.146	[Hz] 10 ... 200	Start frequency of the frequency ramp stop for CLOSE	see Parameter P.141

11.9 I x R compensation

I x R compensation increases the voltage and with it the motor power only in the lower speed range.

P.	[Unit] Range	Function	Description/ Note
P.142	[Hz] 0 ... 15	IxR compensation for OPEN	In this parameter you specify the frequency up to which I x R compensation is in effect. The voltage is held to the same value below this frequency. The voltage value is derived from the voltage which is normally output for the frequency set here.
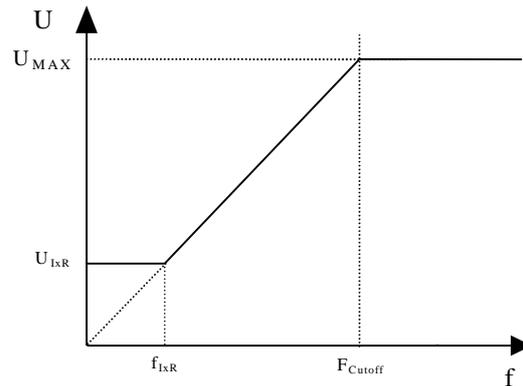
Figure 4: IxR compensation characteristic curve

P.147	[Hz] 0 ... 15	IxR compensation for CLOSE	see Parameter P.142

11.10 Voltage reduction

Reducing the motor voltage which is output prevents over-excitation of the motor. This reduces power dissipation and noise.

P.	[Unit] Range	Function	Description/ Note
P.143	[%] 35 ... 100	Voltage reduction for OPEN	The indicated value specifies what percent of the output voltage is given out.
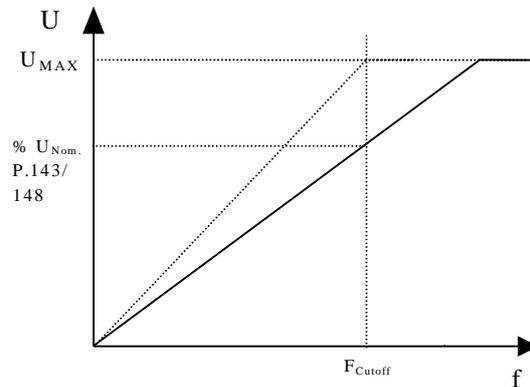
Figure 5: Voltage reduction characteristic curve

P.	[Unit] Range	Function	Description/ Note
P.148	[%] 35 ... 100	Voltage reduction for CLOSE	see Parameter P.143

11.11 Selecting the positioning system

P.	[Unit] Range	Function	Description/ Note
P.202	0 ... 20	Transmission ratio	With this parameter the transmission ratio of the encoder to the motor is set. As faster the drive shaft is as higher has the parameter value to be. ⓘ *This parameter is only visible in case of TST PD set as limit switch*
P.205	0 ... 8	Selecting the positioning system profile	This profile sets the limit switch system. Select from the following settings: 0: Mechanical limit switches 1. The absolute limit switches are processed as normally closed and the pre-limit switches as normally open. 1: Mechanical limit switches 2. All limit switches are processed as normally closed. 2: Incremental encoders with reference switch in lower end position. 3: Absolute encoder DES-A (GfA) 4: Absolute encoder TST PB-A 7: Absolute encoder DES-B (Kostal) 8: Absolute encoder TST PD / TST PE ⓘ *In case of TST PE Parameter P.202 has to be 20.* ⓘ *The exact settings which this profile involves can be found in Appendix: Position Sensor Profile.* ⚠️ **In addition, the standard functions of the controller inputs are matched to the limit switch type in use.**

11.12 End position correction

P.	[Unit] Range	Function	Description/ Note
P.210	0 ... 5	New teaching of the end positions	This parameter is used to start a new teaching of the end positions. The corresponding end positions are moved to in deadman mode after activating the procedure and saved by holding down the Stop key. Select from the following settings: 0: Cancel, no end positions are taught. 1: Limit switch Lower, limit switch Upper and if appropriate limit switch Intermediate Stop are taught. 2: Limit switch Upper and if appropriate limit switch Intermediate Stop are taught. 3: Limit switch Lower and limit switch Upper are taught. 4: Limit switch Intermediate Stop is taught. 5: All limit switches and the turndirection are taught. ℹ️ *Teaching the Intermediate Stop limit switch depends on the setting in Parameter P.244 (see section Partial Opening / Intermediate Stop).*
P.215	0 ... 1	Requesting correction of the pre-limit switch and limit switch bands	If automatic calculation of the pre-limit switch and limit switch bands (P.216) is activated, this parameter can be used to start a new teaching of the pre-limit switch and limit switch bands. 0: Make no correction. 1: Start correction of the pre-limit switch and limit switch bands. ℹ️ *Correction of the pre-limit switch and limit switch bands is only possible if P.216 = 2.*

P.	[Unit] Range	Function	Description/ Note
P.216	0 ... 2	Activating auto correction / Selecting the ramp setting mode	There are two basic ways to set the steepness of a ramp. The ramp time can be set in milliseconds, or the ramp acceleration can be set in Hz per second. In addition, the limit switch bands are automatically set when Automatic is activated.
			0: Ramp times have to be set manuelly (as in earlier door controllers from FEIG ELECTRONIC GmbH).
			1: Ramp acceleration has to be set manuelly.
			2: Ramp acceleration has to be set and limit switches are automatically set.
			⚠️ **In case of changing the speed of the door or one of the ramp accelerations the automatically setting of the pre limit switches and limit switch bands will start again.The values set in the corresponding parameters are then overwritten.**
			ℹ️ *Automatic teaching of the limit switches and pre limit switches only functions if accelerations for ramps are set. You cannot use ramp times as they were defined in earlier versions of the controllers.*
P.217	0 ... 600	Tolerance band of automatic end switch correction	With this parameter an offset is set to the end position find out by the automatic end switch correction. Because of that the door is not able to overrun the end switch position of the door by the first move. The end switch position will move by the value (in percent) adjusted with this parameter.

11.13 CLOSE

⚠️
If automatic setting of the pre-limit switches and limit switch bands is used (P.216 = 2), Parameters P.222 and P.223 are automatically changed.
The parameters are even changed if the speed of the door or the steepness of a ramp is changed, since this results in a new start of automatic limit switch correction.
If you want to set these ramps manually, P.216 must be < 2.

11.13.1 End position door close modify

P.	[Unit] Range	Function	Description/ Note
P.221	[Increments] -125 ... 125	Correction value End position door CLOSE	This parameter is used to shift the entire lower end position, i.e., the end position is shifted together with the associated pre-limit switches. A change in the parameter value in the positive direction causes the end position to shift up. A change in the parameter value in the negative direction causes the end position to shift down.

11.13.2 Start of Door Closing

P.	[Unit] Range	Function	Description/ Note
P.350	[Hz] 6 ... 200	Travel frequency for rapid CLOSE	Here you specify the maximum close speed in Hz. Start ramp "r5" is used to accelerate to this speed. The steepness of the ramp is set with Parameter P.351 or P.352.
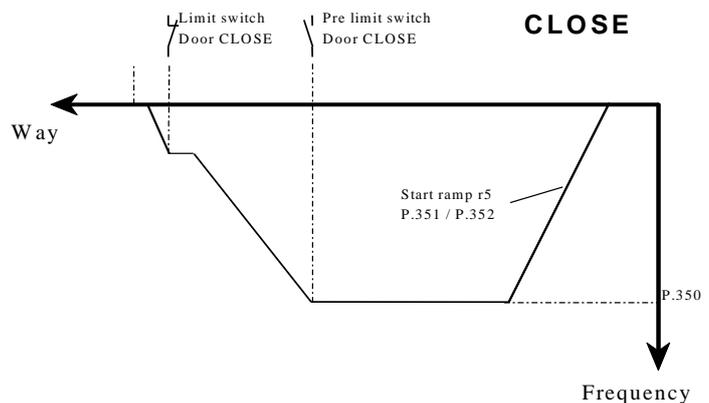
Figure 6: Start ramp, CLOSE

P.	[Unit] Range	Function	Description/ Note
P.351	[10 ms] 20 ... 500	Duration of start ramp "r5"	Time of start ramp "r5" in milliseconds. The door is accelerated within the specified time from 0Hz to the maximum close speed (P.350). Smaller values result in greater acceleration of the door. Larger values result in diminished acceleration of the door. ℹ️ *This parameter is only visible and settable if Parameter P.216 is set to 0.*
P.352	[Hz/s] 5 ... 300	Acceleration of start ramp "r5"	Acceleration during start ramp "r5" in Hertz per second. Smaller values result in diminished acceleration of the door. Larger values result in greater acceleration of the door. ℹ️ *This parameter is only visible and settable if Parameter P.216 is greater than 0.*

11.13.3 Slow down after Pre-limit switch during Door CLOSE

P.	[Unit] Range	Function	Description/ Note
P.222	[Increments] 0 ... 2100	Pre-limit switch position Door CLOSE	The parameter value specifies the distance to the absolute limit switch Door CLOSE in increments. The pre-limit switch is used to initiate the brake ramp "r6". The steepness of the ramp is set with Parameter P.361 or P.362.
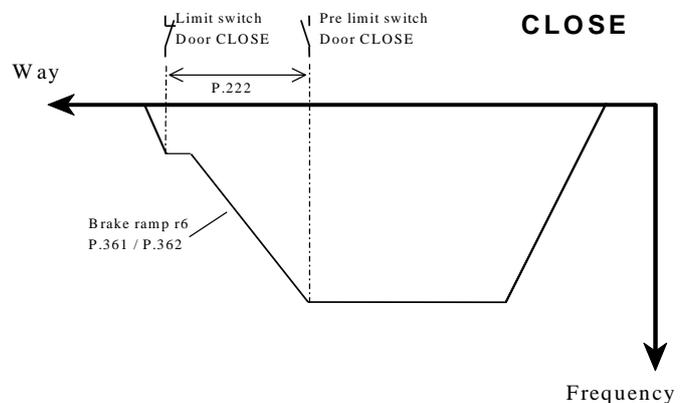
Figure 7: Pre-limit switch position Door CLOSE

P.	[Unit] Range	Function	Description/ Note
P.360	[Hz] 6 ... 200	Creep speed frequency for CLOSE	Brake ramp "r6" is used to slow to creep speed frequency, and is initiated after activation of the pre-limit switch Door CLOSE. The steepness of the brake ramp "r6" is set with Parameter P361 or P.362.
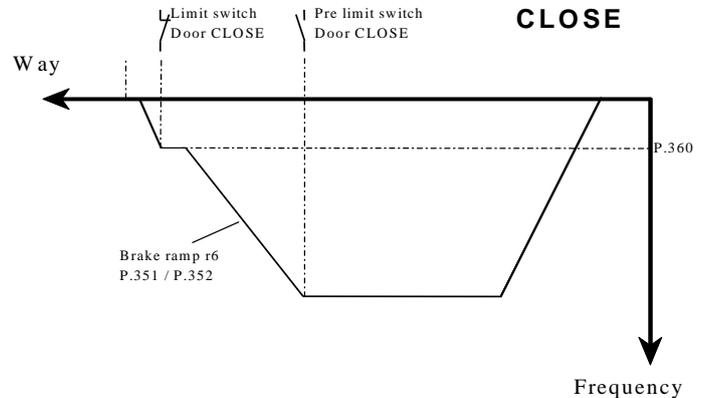
Figure 8: Creep move for CLOSE

P.	[Unit] Range	Function	Description/ Note
P.361	[10 ms] 15 ... 500	Duration of brake ramp "r6"	This parameter specifies the time of brake ramp "r6" in milliseconds. The door is decelerated from maximum close frequency (P350) to creep frequency (P.360) within this time. Smaller values result in greater deceleration of the door. Larger values result in diminished deceleration of the door. **ⓘ** *This parameter is only visible and settable if Parameter P.216 is set to 0.*
P.362	[Hz/s] 5 ... 300	Acceleration of brake ramp "r6"	This parameter specifies the acceleration of the door during brake ramp "r6" in Hertz per second. Smaller values result in diminished deceleration of the door. Larger values result in greater deceleration of the door. **ⓘ** *This parameter is only visible and settable if Parameter P.216 is greater than 0.*

11.13.4 Stopramp after stop is triggered (CLOSE)

P.	[Unit] Range	Function	Description/ Note
P.382	[Hz/s] 5 ... 300	Acceleration of stop ramp "r STOP-Z" after stop is triggered	Acceleration during stop ramp "r STOP-Z" in Hertz per second. The door is decelerated from maximum close speed to 0 Hz after a stop command is given. Smaller values result in diminished acceleration of the door. Larger values result in greater acceleration of the door. 🛈 *This ramp also takes effect after the photo eye is interrupted.* 🛈 *This parameter is only visible and settable if Parameter P.216 is greater than 0.*

11.14 Open

⚠️
If automatic setting of the pre-limit switch and limit switch bands is used (P.216 = 2), Parameters P.232 and P.233 are automatically changed.
The parameters are even changed if the speed of the door or the steepness of a ramp is changed, since this results in a new start of automatic limit switch correction.
If you want to set these ramps manually, P.216 must be < 2.

11.14.1 Adjust the end position Door open

P.	[Unit] Range	Function	Description/ Note
P.231	[Increments] -60 ... 60	Correction value End position Door OPEN	This parameter is used to shift the entire Door OPEN end position, i.e., the end position is shifted together with the associated pre-limit switches. A change in the parameter value in a positive direction causes the end position to shift up. A change in the parameter value in the negative direction causes the end position to shift down.

11.14.2 Start Door Opening

P.	[Unit] Range	Function	Description/ Note
P.310	[Hz] 6 ... 200	Travel frequency for rapid OPEN	Here you specify the maximum open speed in Hz. Start ramp "r1" is used to accelerate to this speed. The steepness of the ramp is set with Parameter P.311 or P.312.
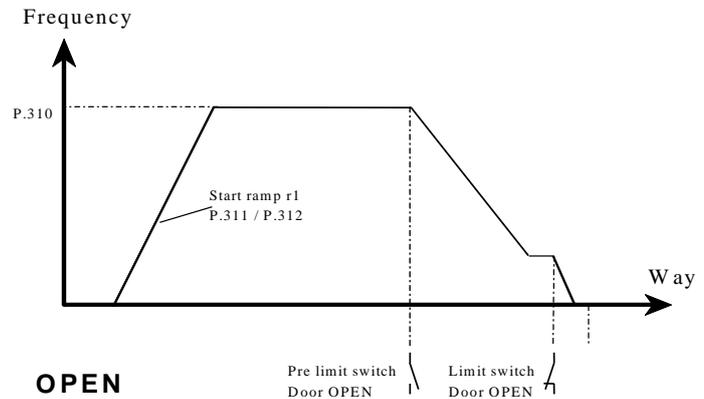
Figure 9: Start ramp, OPEN move

P.	[Unit] Range	Function	Description/ Note
P.311	[10 ms] 20 ... 500	Duration of start ramp "r1"	Time of start ramp "r1" in milliseconds. The door is accelerated within the specified time from 0Hz to the maximum open speed (P.310). Smaller values result in greater acceleration of the door. Larger values result in diminished acceleration of the door. ℹ️ *This parameter is only visible and settable if Parameter P.216 is set to 0.*
P.312	[Hz/s] 5 ... 300	Acceleration of start ramp "r1"	Acceleration during start ramp "r1" in Hertz per second. Smaller values result in diminished acceleration of the door. Larger values result in greater acceleration of the door. ℹ️ *This parameter is only visible and settable if Parameter P.216 is greater than 0.*

11.14.3 Slow down after pre-limit switch is triggered during Door OPEN

P.	[Unit] Range	Function	Description/ Note
P.232	[Increments] 0 ... 2100	Pre-limit switch position Door OPEN	The parameter value specifies the distance to the Door OPEN absolute limit switch in increments. The pre-limit switch is used to initiate the brake ramp "r2". The steepness of the ramp is set with Parameter P.321 or P.322.
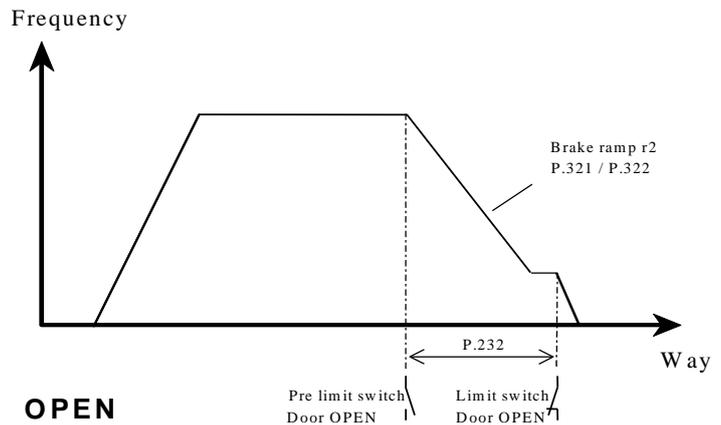
Figure 10: Pre-limit switch position Door OPEN

P.	[Unit] Range	Function	Description/ Note
P.320	[Hz] 6 ... 200	Creep speed frequency for OPEN	Brake ramp "r2" is used to slow to creep speed frequency, and is initiated after activation of the pre-limit switch Door OPEN. The steepness of the brake ramp "r2" is set with Parameter P321 or P.322.
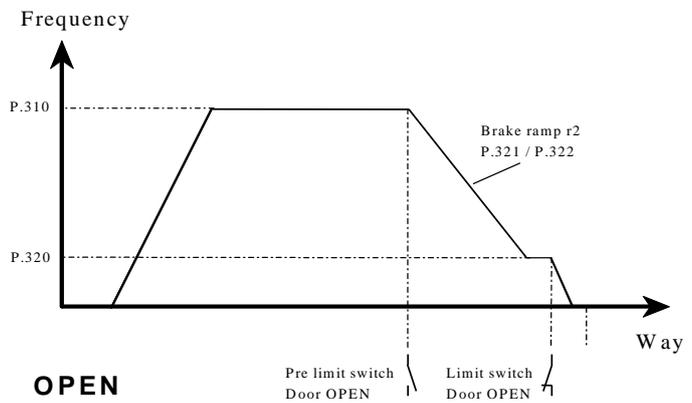
Figure 11: Creep move for OPEN

P.	[Unit] Range	Function	Description/ Note
P.321	[10 ms] 15 ... 500	Duration of brake ramp "r2"	This parameter specifies the acceleration of the door during brake ramp "r2" in Hertz per second. Smaller values result in diminished deceleration of the door. Larger values result in greater deceleration of the door. ℹ️ *This parameter is only visible and settable if Parameter P.216 is greater than 0.*
P.322	[Hz/s] 5 ... 300	Acceleration of brake ramp "r2"	This parameter specifies the acceleration of the door during brake ramp "r2" in Hertz per second. Smaller values result in diminished deceleration of the door. Larger values result in greater deceleration of the door. ℹ️ *This parameter is only visible and settable if Parameter P.216 is greater than 0.*

11.14.4 Stop ramp after stop is triggered (OPEN)

P.	[Unit] Range	Function	Description/ Note
P.340	[10 ms] 15 ... 250	Duration of stop ramp "r STOP-A" after stop is triggered	Time of stop ramp "r STOP-A" in milliseconds. The door is decelerated in the specified time from maximum open speed to 0 Hz after triggering of a stop command. Smaller values result in greater acceleration of the door. Larger values result in diminished acceleration of the door.

Frequency

Stop ramp r$_{STOP-A}$
P.340 / P.342

Way

Pre limit switch
Door OPEN

Limit switch
Door OPEN
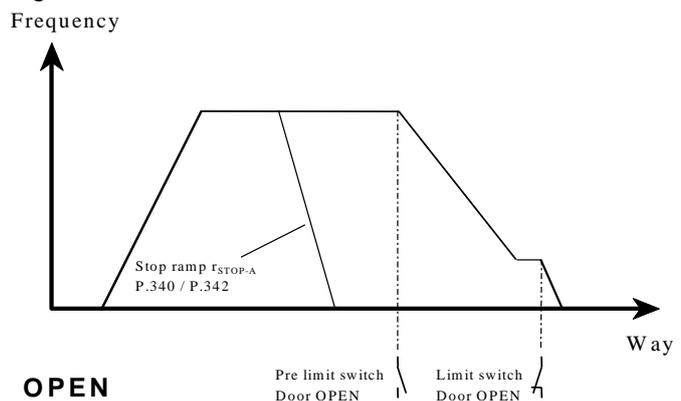
OPEN

Figure 12: Triggering of Stop for OPEN move

ℹ️ *This parameter is only visible and settable if Parameter P.216 is set to 0.*

P.	[Unit] Range	Function	Description/ Note
P.342	[Hz/s] 5 ... 300	Acceleration of stop ramp " r STOP-A" after stop is triggered	Acceleration during stop ramp "r STOP-A" in Hertz per second. The door is decelerated from maximum open speed to 0 Hz after a stop command is given. Smaller values result in diminished acceleration of the door. Larger values result in greater acceleration of the door. 🛈 *This parameter is only visible and settable if Parameter P.216 is greater than 0.*

11.15 Deadman move

P.	[Unit] Range	Function	Description/ Note
P.390	[Hz] 6 ... 100	Move frequency Deadman OPEN move	This parameter specifies the travel speed in Hertz for opening in deadman mode.

11.16 Incremental encoder / Synchronisation

11.17 Synchronization type

P.	[Unit] Range	Function	Description/ Note
P.25F	0 ... 9	Synchronization type profile	This profile is used to set the reference switches and automatic synchronization mode. 0: Deactivated 1: Synchronization to reference switch in Door CLOSE Endposition. 2: Synchronization to to safety edge. 3: Synchronization to reference switch in Door OPEN endposition. 4: Synchronization to mechanical stop in Door OPEN endposition. 5: Synchronization to safety edge and then to mechanical stop in Door OPEN endposition. 6: Synchronization to safety edge and then to reference switch in Door OPEN endposition. 7: Synchronization to reference switch in Door CLOSE endposition and then to mechanical stop in Door OPEN Endposition. 8: Synchronization to mechanical stop in Door CLOSE Endposition and then to mechanical stop in Door OPEN Endposition. 9: Manual synchronization to Door CLOSE Endposition and to Door OPEN Endposition. 🛈 *The exact settings which this profile involves can be found in Appendix: Synchronization Type.*

11.18 Radio safety system

P.	[Unit] Range	Function	Description/ Note
P.92A		Softwareversion FSx mobile unit	Software version of the mobile unit of the wireless safety device.
P.92B		Software version FSx stationary unit	Software version of the stationary unit of the wireless safety device.
P.9F0	[%] 0 ... 100	Capacity of battery	This parameter shows the actuall capacity of the battery.
P.9F1	[Volt]	Battery voltage of radio safety system	Shows the battery voltage of the mobile unit if the radio safety system.
P.9F2	[%]	Wireless status	Shows the quality of the radio link to the mobile unit of the radio safety system.
P.F00	0 ... 1	Activation of the wireless	Activation of the wireless 0: Deactivated 1: Activated
P.F01	[ms] 6 ... 250	Timeout for the wireless	Defines the time in which the radio safety system is set as tripped in case of an radio interruption.
P.F05	1 ... 10	Channelgroup	Sets the channel group ehich the radio safety system is using.
P.F07	00000000 ... 0FFFFFFF	Address of the mobile unit	Address of the mobile unit with which the wireless security system should communicate ⚠️**ATTENTION** **After entering the address it is necessary to check whether the controller is connected to and works with the selected oportable unit.** ℹ️ *It is also possible to "learn" the address automatically. To do this, the parameter must be set to - then the mobile unit must be reset by removing the battery. The address is then entered into the parameter and can be saved*
P.F09	[Volt] 1,2 ... 3,6	Battery nominal voltage	Here the nominal voltage of the battery is put in.

11.18.1 FSx input profiles

ℹ️ *The settings that may be necessary for these profiles are available from the attachments.*

P.	[Unit] Range	Function	Description/ Note
A.F00	1 ... 2	FSx Wireless safety system profile	This Profile activates the radio safety system TST FSx and sets configurations for the typical door applications. 0: No profile set 1: Settings for sectional door / overhead doors 2: Roll door, WiCab PE_FSBS and FSBM
P.F1F	0000 ... F302	Function input 1	Selection of the Input configuration for the input 1of the FSx unit. 0000: Deactivated F101: Safety edge 8K2 F102: Dynamical optical safety edge F201: Flap door switch digital F202: Flap door switch 8k2 F203: Slack rope switch digital F206: Thermo pill F207: Crank switch F301: Crash impulse switch with handshake F302: crash static
P.F2F	0000 ... F302	Function input 1	Make a selection from the Inputconfiguration for the input 2 of the FSx unit 0000: Deactivated F101: Safety edge 8K2 F102: Dynamical optical safety edge F201: Flap door switch digital F202: Flap door switch 8k2 F203: Slack rope switch digital F206: Thermo pill F207: Crank switch F301: Crash impulse switch with handshake F302: crash static
P.F3F	0000 ... F302	Function input 3	Make a selection from the Inputconfiguration for the input 3 of the FSx unit 0000: Deactivated F101: Safety edge 8K2 F102: Dynamical optical safety edge F201: Flap door switch digital F202: Flap door switch 8k2 F203: Slack rope switch digital F206: Thermo pill F207: Crank switch F301: Crash impulse switch with handshake F302: crash static

P.	[Unit] Range	Function	Description/ Note
P.F4F	0000 ... F302	Function input 4	Make a selection from the Inputconfiguration for the input 4 of the FSx unit 0000: Deactivated F101: Safety edge 8K2 F102: Dynamical optical safety edge F201: Flap door switch digital F202: Flap door switch 8k2 F203: Slack rope switch digital F206: Thermo pill F207: Crank switch F301: Crash impulse switch with handshake F302: crash static ⓘ *This parameter is visible only in connection with TST FSBM mobile unit.*

11.18.2 FSx input 1

P.	[Unit] Range	Function	Description/ Note
P.F10	0 ... 4	Mode input 1	Defines the operation mode of input 1 of the mobile unit. 0: Deactivated 1: Analogue evaluation with 8K2 Ohm 2: Analogue evaluation with 1K2 Ohm 3: Dynamic optical system 4: Digital evaluation
P.F11	0 ... 2	Safety	This parameter specifies how the input will work after the radio signal is missing. 0: Input active at missing radio signal and always in sleepmode. 1: Input active at missing radio signal 2: The last status of the input is given out (missing radio signal and sleepmode doesn`t change the output)
P.F12	0 ... 1	Contact type	Specifies the contact type of the switch which is connected to the input. 0: Normally open 1: Normally closed
P.F13	0 ... 1	Debouncing time	This Parameter determine the debouncing time for the Input 0: Short debouncing time (3 ms) 1: Long debouncing time (30 ms)
P.F16	1 ... 3	Output	With this parameter the allocation from the input 1 of the mobile unit to the stationary unit is done. 1: Output 1 2: Output 2 3: Output 3
P.F19	0 ... 57	LCD Messages	Select the LCD Messages which are shown in the Display 🛈 *The list of messages can be found in the Appendix LCD Messages*

11.18.3 FSx input 2

P.	[Unit] Range	Function	Description/ Note
P.F20	0 ... 4	Mode input 2	Defines the operation mode of input 2 of the mobile unit. 0: Deactivated 1: Analogue evaluation with 8K2 Ohm 2: Analogue evaluation with 1K2 Ohm 3: Dynamic optical system 4: Digital evaluation
P.F21	0 ... 2	Safety	This parameter specifies how the input will work after the radio signal is missing. 0: Input active at missing radio signal and always in sleepmode. 1: Input active at missing radio signal 2: The last status of the input is given out (missing radio signal and sleepmode doesn`t change the output)
P.F22	0 ... 1	Contact type	Specifies the contact type of the switch which is connected to the input. 0: Normally open 1: Normally closed
P.F23	0 ... 1	Debouncing Time	This Parameter determine the debouncing time for the Input 0: Short debouncing time (3 ms) 1: Long debouncing time (30 ms)
P.F26	1 ... 3	Output	With this parameter the allocation from the input 2 of the mobile unit to the stationary unit is done. 1: Output 1 2: Output 2 3: Output 3
P.F29	0 ... 57	LCD Messages	Select the LCD Messages which are shown in the Display 🛈 *The list of messages can be found in the Appendix LCD Messages*

11.18.4 FSx input 3

P.	[Unit] Range	Function	Description/ Note
P.F30	0 ... 4	Mode input 3	Defines the operation mode of input 3 of the mobile unit. 0: Deactivated 1: Analogue evaluation with 8K2 Ohm 2: Analogue evaluation with 1K2 Ohm 3: Dynamic optical system 4: Digital evaluation
P.F31	0 ... 2	Safety	This parameter specifies how the input will work after the radio signal is missing. 0: Input active at missing radio signal and always in sleepmode. 1: Input active at missing radio signal 2: The last status of the input is given out (missing radio signal and sleepmode doesn`t change the output)
P.F32	0 ... 1	Contact type	Specifies the contact type of the switch which is connected to the input. 0: Normally open 1: Normally closed
P.F33	0 ... 1	Debouncing time	This Parameter determine the debouncing time for the Input 0: Short debouncing time (3 ms) 1: Long debouncing time (30 ms)
P.F36	1 ... 3	Output	With this parameter the allocation from the input 3 of the mobile unit to the stationary unit is done. 1: Output 1 2: Output 2 3: Output 3
P.F39	0 ... 57	LCD Messages	Select the LCD Messages which are shown in the Display 🛈 *The list of messages can be found in the Appendix LCD Messages*

11.18.5 FSx input 4

ℹ️ *The input 4 of the mobile unit is only possible with TST FSBM. The following parameters are only visible by using this mobile unit.*

P.	[Unit] Range	Function	Description/ Note
P.F40	0 ... 4	Mode input 4	Defines the operation mode of input 4 of the mobile unit. 0: Deactivated 1: Analogue evaluation with 8K2 Ohm 2: Analogue evaluation with 1K2 Ohm 3: Dynamic optical system 4: Digital evaluation
P.F41	0 ... 2	Safety	This parameter specifies how the input will work after the radio signal is missing. 0: Input active at missing radio signal and always in sleepmode. 1: Input active at missing radio signal 2: The last status of the input is given out (missing radio signal and sleepmode doesn`t change the output)
P.F42	0 ... 1	Contact type	Specifies the contact type of the switch which is connected to the input. 0: Normally open 1: Normally closed
P.F43	0 ... 1	Debouncing time	This Parameter determine the debouncing time for the Input 0: Short debouncing time (3 ms) 1: Long debouncing time (30 ms)
P.F46	1 ... 3	Output	With this parameter the allocation from the input 4 of the mobile unit to the stationary unit is done. 1: Output 1 2: Output 2 3: Output 3
P.F49	0 ... 57	LCD Messages	Select the LCD Messages which are shown in the Display ℹ️ *The list of messages can be found in the Appendix LCD Messages*

11.18.6 FSx stationary unit inputs

ℹ️ *The stationary inputs are existing only on TST PE FSB stationary unit.*

P.	[Unit] Range	Function	Description/ Note
P.FA9	0 ... 57	LCD- Messages	Select the LCD Messages which are shown in the Display ℹ️ *The list of messages can be found in the Appendix LCD Messages*
P.FB9	0 ... 57	LCD Messages	Select the LCD Messages which are shown in the Display ℹ️ *The list of messages can be found in the Appendix LCD Messages*
P.FC9	0 ... 57	LCD Messages	Select the LCD Messages which are shown in the Display ℹ️ *The list of messages can be found in the Appendix LCD Messages*

11.19 Safety Edges

The following parameters can be set both for integrated safety edge processing as well as for external safety edge processing (optional for different controllers) .

11.19.1 Integrated safety edge processing

The controllers have a safety edge processor already on the motherboard.
No additional plug-in cards are necessary.

P.	[Unit] Range	Function	Description/ Note
P.460	0 ... 6	profile internal safety edge	With this profile the parameter´s for the function of the internal safety edge are set. 0: Deactivated 1: Electrical safety edge, redundantly processed, functioning as normally open 2: Electrical safety edge, redundantly processed, functioning as normally closed 3: Electrical safety egde with testing in Door close end position, functioning as normally open 4: Electrical safety egde with testing in Door close end position, functioning as normally closed 5: Dynamic optical system 6: Automatically detection of the connected safety edge. Electrical N.O. edges and dynamic optical systems are recognised automatically. ℹ️ *The exact settings which this profile involves can be found in the Appendix :Safety egde profile*
P.466	0 ... 2	External testing of safety edge	With this parameter a testing of the safety edge can resquested. Testing is possible in door CLOSE or OPEN position. 0: No test 1: Test in the endpostion Door Open and after start up of the controller 2: Test in the endpostion Door Close and after start up of the controller

11.20 Input profiles

P.	[Unit] Range	Function	Description/ Note
P.501	0000 ... 1408	Function of Input 1	This profile can be used to specify the function of the input. All parameters needed for the function of the input are changed in one step. ℹ️ *The exact settings which this profile involves can be found in Chapter "Overview of Input Profiles"*
P.502	0000 ... 1408	Function of Input 2	see P.501
P.503	0000 ... 1408	Function of Input 3	see P.501
P.504	0000 ... 1408	Function of Input 4	see P.501
P.505	0000 ... 1408	Function of Input 5	see P.501
P.506	0000 ... 1408	Function of Input 6	see P.501
P.507	0000 ... 1408	Function of Input 7	see P.501
P.508	0000 ... 1408	Function of Input 8	see P.501
P.509	0000 ... 1408	Function of Input 9	see P.501
P.50A	0000 ... 1408	Function of Input 10	see P.501

11.21 Input profiles with expansion board

⚠️
The expansion board can not be used with all controllers.

⚠️
The expansion board is activated with P.800 =1.

P.	[Unit] Range	Function	Description/ Note
P.A01	0000 ... 1408	Function of Input 21	see P.501
P.A02	0000 ... 1408	Function of Input 22	see P.501
P.A03	0000 ... 1408	Function of Input 23	see P.501
P.A04	0000 ... 1408	Function of Input 24	see P.501
P.A05	0000 ... 1408	Function of Input 25	see P.501
P.A06	0000 ... 1408	Function of Input 26	see P.501
P.A07	0000 ... 1408	Function of input 27	see P.501
P.A08	0000 ... 1408	Function of input 28	see P.501

11.21.1 Overview of Input Profiles

0000	Input functions	Input deactivated
	Mode	-
	Contact type	-
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	-

0101	Input functions	OPEN command
	Mode	OPEN 1, lockable
	Contact type	N.O., Normally open
	End position to move to	End position Door OPEN
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0102	Input functions	OPEN command
	Mode	OPEN 1, lockable
	Contact type	N.O., Normally open
	End position to move to	End position intermediate stop / partial opening
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0103	Input functions	OPEN command
	Mode	OPEN airlock move, not lockable
	Contact type	N.O., Normally open
	End position to move to	End position intermediate stop / partial opening
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0104	Input functions	OPEN command
	Mode	OPEN 1, lockable
	Contact type	N.O., Normally open
	End position to move to	End position intermediate stop / partial opening
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	From outside to inside
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0105	Input functions	OPEN command
	Mode	OPEN 2, lockable
	Contact type	N.O., Normally open
	End position to move to	End position Door OPEN
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0106	Input functions	OPEN command
	Mode	OPEN 2, lockable
	Contact type	N.O., Normally open
	End position to move to	End position Door OPEN
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	From inside to outside
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0107	Input functions	OPEN command
	Mode	OPEN 4, not lockable
	Contact type	N.O., Normally open
	End position to move to	End position Door OPEN
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0108	Input functions	OPEN command
	Mode	OPEN 2, lockable
	Contact type	N.O., Normally open
	End position to move to	End position intermediate stop / partial opening
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0109	Input functions	OPEN command
	Mode	OPEN 3, not lockable
	Contact type	N.O., Normally open
	End position to move to	End position intermediate stop / partial opening
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0110	Input functions	OPEN command
	Mode	OPEN 1, lockable
	Contact type	N.O., Normally open
	End position to move to	End position Door OPEN
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	From outside to inside
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0111	Input functions	OPEN command
	Mode	OPEN 1, lockable
	Contact type	N.C., Normally closed
	End position to move to	End position Door OPEN
	Hold-open time / Priority	Without auto close time
	Clear time	No clear time / pre-warning time
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0112	Input functions	OPEN command
	Mode	OPEN 1, lockable
	Contact type	N.O., Normally open
	End position to move to	End position Door OPEN
	Hold-open time / Priority	Without auto close time
	Clear time	With clear time / pre-warning time (P.025)
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0114	Input functions	OPEN command
	Mode	OPEN airlock move, not lockable
	Contact type	N.O., Normally open
	End position to move to	End position intermediate stop / partial opening
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	From inside to outside
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0116	Input functions	OPEN command
	Mode	OPEN 1, lockable
	Contact type	N.O., Normally open
	End position to move to	End position Door OPEN
	Hold-open time / Priority	Without auto close time
	Clear time	With clear time / pre-warning time (P.025)
	Direction	From outside to inside
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0117	Input functions	OPEN command
	Mode	OPEN 1, lockable
	Contact type	N.O., Normally open
	End position to move to	End position Door OPEN
	Hold-open time / Priority	Without auto close time
	Clear time	With clear time / pre-warning time (P.025)
	Direction	From inside to outside
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0120	Input functions	OPEN command
	Mode	OPEN 2, lockable
	Contact type	N.O., Normally open
	End position to move to	End position Door OPEN
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	No clear time / pre-warning time
	Direction	From inside to outside
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0121	Input functions	OPEN command
	Mode	OPEN 1, lockable
	Contact type	N.O., Normally open
	End position to move to	End position Door OPEN
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	No clear time / pre-warning time
	Direction	From outside to inside
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0124	Input functions	OPEN command
	Mode	OPEN 2, lockable
	Contact type	N.O., Normally open
	End position to move to	End position intermediate stop / partial opening
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	From inside to outside
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0125	Input functions	OPEN command
	Mode	OPEN 2, lockable
	Contact type	N.O., Normally open
	End position to move to	End position Door OPEN
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	From inside to outside
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0129	Input functions	OPEN command
	Mode	OPEN 2, lockable
	Contact type	N.O., Normally open
	End position to move to	End position intermediate stop / partial opening
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	From outside to inside
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0201	Input functions	Single channel / pull switch
	Mode	OPEN -> End position -> CLOSE -> OPEN
	Contact type	N.O., Normally open
	End position to move to	When activating in Door CLOSE end position, the door travels up to the intermediate stop / partial opening end position, when activating in intermediate stop position the door travels up to the Door OPEN end position.
	Hold-open time / Priority	With auto close time (P.010 or P.011)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0202	Input functions	Single channel / pull switch
	Mode	OPEN -> End position -> CLOSE -> OPEN
	Contact type	N.O., Normally open
	End position to move to	like 2., but the door travels directly to the Door OPEN end position if activation takes place 2x in quick succession in the Lower end position.
	Hold-open time / Priority	Without auto close time
	Clear time	With clear time / pre-warning time (P.025)
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0203	Input functions	Single channel / pull switch
	Mode	OPEN -> End position -> CLOSE -> OPEN
	Contact type	N.O., Normally open
	End position to move to	like 2., but the door travels directly to the Door OPEN end position if activation takes place 2x in quick succession in the Lower end position.
	Hold-open time / Priority	Without auto close time
	Clear time	With clear time / pre-warning time (P.025)
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0204	Input functions	Single channel / pull switch
	Mode	OPEN -> End position -> CLOSE -> OPEN
	Contact type	N.O., Normally open
	End position to move to	End position Door OPEN
	Hold-open time / Priority	Without auto close time
	Clear time	With clear time / pre-warning time (P.025)
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0301	Input functions	Permanent open command
	Mode	Permanent open command
	Contact type	N.O., Normally open
	End position to move to	When activating in Door CLOSE end position, the door travels up to the intermediate stop / partial opening end position, when activating in intermediate stop position the door travels up to the Door OPEN end position.
	Hold-open time / Priority	-
	Clear time	-
	Direction	Both directions are cleared
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0304	Input functions	Permanent open command
	Mode	Permanent open command
	Contact type	N.O., Normally open
	End position to move to	End position Door OPEN
	Hold-open time / Priority	-
	Clear time	-
	Direction	No direction specified
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0401	Input functions	Stop command
	Mode	Stop function
	Contact type	N.C., Normally closed
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0402	Input functions	Stop command
	Mode	Stop function
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0403	Input functions	Stop command
	Mode	Stop function and also acknowledgement function, i.e. this input is used for an acknowledgement. An acknowledgement must be performed e.g. under the conditions defined in P.408
	Contact type	N.C., Normally closed
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0404	Input functions	Stop command
	Mode	Stop function and also acknowledgement function, i.e. this input is used for an acknowledgement. An acknowledgement must be performed e.g. under the conditions defined in P.408
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0501	Input functions	Safety B
	Mode	Safety during closing: Reversing during automatic closing, stop during jog closing, no reaction during opening
	Contact type	N.C., Normally closed
	End position to move to	Same end position as the previously activated input moved to.
	Hold-open time / Priority	Auto close time as used before with the last open command.
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0502	Input functions	Safety B
	Mode	Safety during closing: Reversing during automatic closing, stop during jog closing, no reaction during opening
	Contact type	N.C., Normally closed
	End position to move to	Same end position as the previously activated input moved to.
	Hold-open time / Priority	Auto close time as used before with the last open command.
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0504	Input functions	Safety B
	Mode	Safety during closing: Reversing during automatic closing, stop during jog closing, no reaction during opening
	Contact type	N.C., Normally closed
	End position to move to	Same end position as the previously activated input moved to.
	Hold-open time / Priority	With minimum auto close time (P.015)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0505	Input functions	Safety B
	Mode	Safety during closing: Reversing during automatic closing, stop during jog closing, no reaction during opening
	Contact type	N.O., Normally open
	End position to move to	Same end position as the previously activated input moved to.
	Hold-open time / Priority	Auto close time as used before with the last open command.
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0506	Input functions	Safety B
	Mode	Safety during closing: Reversing during automatic closing, stop during jog closing, no reaction during opening
	Contact type	N.C., Normally closed
	End position to move to	Same end position as the previously activated input moved to.
	Hold-open time / Priority	With minimum auto close time (P.015)
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0507	Input functions	Safety B
	Mode	Safety during closing: Reversing during automatic closing, stop during jog closing, no reaction during opening
	Contact type	N.O., Normally open
	End position to move to	Same end position as the previously activated input moved to.
	Hold-open time / Priority	Auto close time as used before with the last open command.
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0601	Input functions	Jog mode / Automatic switch
	Mode	Manual permits opening and closing
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0602	Input functions	Jog mode / Automatic switch
	Mode	Manual permits closing only
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0701	Input functions	Close command
	Mode	Closing in automatic mode only
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	Without auto close time
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0801	Input functions	Door locking in end position
	Mode	Door locking in end position Door-CLOSE, no deadman move permitted
	Contact type	N.O., Normally open
	End position to move to	Locking in end position Door-OPEN
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0802	Input functions	Door locking in end position
	Mode	Door locking in end position Door-CLOSE, Deadman move permitted
	Contact type	N.O., Normally open
	End position to move to	Locking in end position Door-OPEN
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0803	Input functions	Door locking in end position
	Mode	Door locking in position which is set by parameter P.5x3. Also a drive command is given so that the door moves automaticaly in creep speed (P.320) to the adjusted position.
	Contact type	N.O., Normally open
	End position to move to	Locking in end position Door-OPEN
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0804	Input functions	Door locking in end position
	Mode	Door locking in position which is set by parameter P.5x3. Also a drive command is given so that the door moves automaticaly in creep speed (P.320) to the adjusted position.
	Contact type	N.O., Normally open
	End position to move to	Locking in end position Door-CLOSE
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0901	Input functions	Cross traffic input
	Mode	Detector channel1 and OPEN 1 commands
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0902	Input functions	Cross traffic input
	Mode	is locked by partner detector. Additionally open commands of the partner are locked.
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

0903	Input functions	Cross traffic input
	Mode	Detector Channels 1 and 2 as well as OPEN 1 and 2 commands
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1001	Input functions	Deactivation input
	Mode	Hold-open time / Forced closing
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1002	Input functions	Deactivation input
	Mode	Airlock function
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1003	Input functions	Deactivation input
	Mode	Intermediate stop / partial opening
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1004	Input functions	Deactivation input
	Mode	Detector commands from the outside (P.666 or P.676) DET 1
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1101	Input functions	Limit switch input
	Mode	Pre-limit switch Photoeye
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1102	Input functions	Limit switch input
	Mode	Intermediate stop / partial opening limit switch
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1103	Input functions	Limit switch input
	Mode	Pre-limit switch Intermediate stop / partial opening
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1104	Input functions	Limit switch input
	Mode	Pre-limit switch safety edge
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1105	Input functions	Limit switch input
	Mode	Pre-limit switch safety edge
	Contact type	N.C., Normally closed
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1106	Input functions	Limit switch input
	Mode	Pre-limit switch Door OPEN
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1107	Input functions	Limit switch input
	Mode	Pre-limit switch Door OPEN
	Contact type	N.C., Normally closed
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1108	Input functions	Limit switch input
	Mode	Pre-limit switch Door CLOSE
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1109	Input functions	Limit switch input
	Mode	Pre-limit switch Door CLOSE
	Contact type	N.C., Normally closed
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1110	Input functions	Limit switch input
	Mode	Limit switch Door Open
	Contact type	N.C., Normally closed
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1111	**Input functions**	Limit switch input
	Mode	Limit switch Door Close
	Contact type	N.C., Normally closed
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1112	**Input functions**	Limit switch input
	Mode	Reference switch
	Contact type	N.O., Normally open
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1113	**Input functions**	Limit switch input
	Mode	Reference switch
	Contact type	N.C., Normally closed
	End position to move to	-
	Hold-open time / Priority	-
	Clear time	-
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1401	**Input functions**	Safety A
	Mode	Safety during closing: Stopping during automatic closing without reversing, stop during jog closing, no reaction during opening
	Contact type	N.C., Normally closed
	End position to move to	End position Door OPEN
	Hold-open time / Priority	Without auto close time
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1402	Input functions	Safety A
	Mode	Safety during closing: Reversing during automatic closing, stop during jog closing, no reaction during opening
	Contact type	N.C., Normally closed
	End position to move to	Same end position as the previously activated input moved to.
	Hold-open time / Priority	Auto close time as used before with the last open command.
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1403	Input functions	Safety A
	Mode	Safety during closing: Stopping during automatic or jog closing, after releasing the input the door moves on to door close position, no reaction during opening
	Contact type	N.C., Normally closed
	End position to move to	End position Door OPEN
	Hold-open time / Priority	Without auto close time
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1404	Input functions	Safety A
	Mode	Safety during closing and opening: Stopping during automatic or jog opening or closing
	Contact type	N.C., Normally closed
	End position to move to	End position Door OPEN
	Hold-open time / Priority	Without auto close time
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1405	Input functions	Safety A
	Mode	Safety during closing and opening: Stopping during automatic or jog opening or closing, after releasing the input the door moves on to door close position
	Contact type	N.C., Normally closed
	End position to move to	End position Door OPEN
	Hold-open time / Priority	Without auto close time
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1406	Input functions	Safety A
	Mode	Safety during opening: Reversing during automatic opening, stopping during jog opening, no reaction during closing
	Contact type	N.C., Normally closed
	End position to move to	Same end position as the previously activated input moved to.
	Hold-open time / Priority	Auto close time as used before with the last open command.
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1407	Input functions	Safety A
	Mode	Safety during opening: Stopping during automatic or jog opening
	Contact type	N.C., Normally closed
	End position to move to	Same end position as the previously activated input moved to.
	Hold-open time / Priority	Auto close time as used before with the last open command.
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	No test

1408	**Input functions**	Safety A
	Mode	Draw in safety: Stopping during automatic or jog opening, then only jog closing possible, no reaction during closing
	Contact type	N.C., Normally closed
	End position to move to	Same end position as the previously activated input moved to.
	Hold-open time / Priority	Auto close time as used before with the last open command.
	Clear time	With clear time / pre-warning time (P.025)
	Direction	-
	Switch on delay of input	0,0 [Seconds]
	Switch off delay of input	0,0 [Seconds]
	LCD-Text	-
	Test	Test in the endpostion Door Close and after start up of the controller

11.22 Output Profiles

P.	[Unit] Range	Function	Description/ Note
P.704	0000 ... 2501	Function of Output 4	see P.701 or P.704
			0000: Output relay deactivated
			0001: Continuously turned on
			0101: Door is Open
			ⓘ *The message depends on the logical status of the gate*
			0102: Doos is Open
			ⓘ *The message depends on the position of the door*
			0201: Door is Closed
			ⓘ *The message depends on the logical status of the gate*
			0203: Door is Closed
			ⓘ *The message depends on the position of the door*
			0401: There is no error
			0501: Courtyard light function, switched ON during opening and closing with 10 s switch off delay after opening.
			0701: Flashing during opening and closing and in partial open position
			0801: Active during opening and closing and during active pre-warning / clearance time.
			1001: Locking second door
			1002: Locking second door, 1 s switch off delay
			1201: Green traffic light on inside of door
			1210: Green traffic light on outside of door
			1220: Red traffic light on inside of door 1
			1221: Flashing red traffic light on inside of door 1
			1222: Red traffic light on inside of door 2
			1223: Flashing red traffic light on inside of door 2
			1224: Red traffic light on inside of door, flashing during pre-warning / clearance time
			1250: Red traffic light on outside of door 1
			1251: Flashing red traffic light on outside of door 1
			1252: Red traffic light on outside of door 2
			1253: Flashing red traffic light on outside of door 2
			1255: Red traffic light on outside of door, flashing during pre-warning / clearance time
			1601: Airlock OPEN
			1701: Testing in end position close
			2501: Testing in endposition OPEN
P.705	0000 ... 2501	Function of Output 5	see P.701 or P.704
P.706	0000 ... 2501	Function of Output 6	see P.701 or P.704
P.707	0000 ... 2501	Function of Output 7	see P.701 or P.704
P.708	0000 ... 2501	Function of Output 8	see P.701 or P.704
P.709	0000 ... 2501	Function of Output 9	see P.701 or P.704

11.22.1 Overview output profiles

0000		
	Switching condition Output relay	Command forwarding
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

0001		
	Switching condition Output relay	Command forwarding
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

0101	Switching condition Output relay	If End position Door OPEN was reliably detected
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

0102	Switching condition Output relay	Command forwarding
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Forwarding door OPEN postion (The forwarding depends only on postion and will not interrupted by the clearance time or door drive)

0201	Switching condition Output relay	If End position Door CLOSE was reliably detected
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

0203	Switching condition Output relay	Command forwarding
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Forwarding door CLOSE position (The forwarding depends only on postion and will not interrupted by the clearance time or door drive)

0401		
	Switching condition Output relay	If there is no fault condition or emergency stop, controller in Automatic mode
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

0501		
	Switching condition Output relay	Courtyard light function, during every OPEN and CLOSE move with 10 turn-off delay after opening.
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

0701	Switching condition Output relay	During each OPEN and CLOSE move
	Switching behavior of the relay	0,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

0801	Switching condition Output relay	During each OPEN and CLOSE move and during active clearing time.
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

1001		
	Switching condition Output relay	Forward external door locking (e.g., airlock operation)
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

1002		
	Switching condition Output relay	Forward external door locking (e.g., airlock operation)
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	1,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

1201	Switching condition Output relay	Traffic light function
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously on
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

1210	Switching condition Output relay	Traffic light function
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green light on outside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously on
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

1220	**Switching condition Output relay**	Traffic light function
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Red traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously on
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Flashing at 1Hz
	Behavior during closing	Continuously on
	Behavior at stop	Continuously on
	Behavior when there is no automatic function	Continuously on
	Command forwarding	Output permanent off

1221	**Switching condition Output relay**	Traffic light function
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Red traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Flashing at 1Hz
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Flashing at 2Hz
	Behavior during closing	Flashing at 1Hz
	Behavior at stop	Continuously on
	Behavior when there is no automatic function	Continuously on
	Command forwarding	Output permanent off

1222	Switching condition Output relay	Traffic light function
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Red traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously on
	Behavior during opening	Continuously on
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Flashing at 1Hz
	Behavior during closing	Continuously on
	Behavior at stop	Continuously on
	Behavior when there is no automatic function	Continuously on
	Command forwarding	Output permanent off

1223	Switching condition Output relay	Traffic light function
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Red traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously on
	Behavior during opening	Flashing at 1Hz
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Flashing at 2Hz
	Behavior during closing	Flashing at 1Hz
	Behavior at stop	Continuously on
	Behavior when there is no automatic function	Continuously on
	Command forwarding	Output permanent off

1224		
	Switching condition Output relay	Traffic light function
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Red traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously on
	Behavior during opening	Continuously on
	Behavior in Door OPEN end position	Turned on in case that the condition of parameter P.7xF is fullfilled.
	Behavior during the clearing phase	Continuously on
	Behavior during closing	Continuously on
	Behavior at stop	Continuously on
	Behavior when there is no automatic function	Continuously on
	Command forwarding	Detector channel 2

1250		
	Switching condition Output relay	Traffic light function
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Red traffic light on outside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously on
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Flashing at 1Hz
	Behavior during closing	Continuously on
	Behavior at stop	Continuously on
	Behavior when there is no automatic function	Continuously on
	Command forwarding	Output permanent off

1251	**Switching condition Output relay**	Traffic light function
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Red traffic light on outside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Flashing at 1Hz
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Flashing at 2Hz
	Behavior during closing	Flashing at 1Hz
	Behavior at stop	Continuously on
	Behavior when there is no automatic function	Continuously on
	Command forwarding	Output permanent off

1252	**Switching condition Output relay**	Traffic light function
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Red traffic light on outside of door
	Behavior in Door CLOSE end position	Continuously on
	Behavior during opening	Continuously on
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Flashing at 1Hz
	Behavior during closing	Continuously on
	Behavior at stop	Continuously on
	Behavior when there is no automatic function	Continuously on
	Command forwarding	Output permanent off

1253		
	Switching condition Output relay	Traffic light function
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Red traffic light on outside of door
	Behavior in Door CLOSE end position	Continuously on
	Behavior during opening	Flashing at 1Hz
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Flashing at 2Hz
	Behavior during closing	Flashing at 1Hz
	Behavior at stop	Continuously on
	Behavior when there is no automatic function	Continuously on
	Command forwarding	Output permanent off

1255		
	Switching condition Output relay	Traffic light function
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Red traffic light on outside of door
	Behavior in Door CLOSE end position	Continuously on
	Behavior during opening	Continuously on
	Behavior in Door OPEN end position	Turned on in case that the condition of parameter P.7xF is fullfilled.
	Behavior during the clearing phase	Continuously on
	Behavior during closing	Continuously on
	Behavior at stop	Continuously on
	Behavior when there is no automatic function	Continuously on
	Command forwarding	Detector channel 1

1601	Switching condition Output relay	Airlock OPEN, forwards OPEN command to second airlock door
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

1701	Switching condition Output relay	Test of draw in safety device. Relay is active in Endposition Close and is used e.g. to switch of the photo eye of the draw in safety in order to test it.
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

2501	**Switching condition Output relay**	Test at the End-Position Door Open Relay works at the End- Position Door Open
	Switching behavior of the relay	1000,0 [Seconds]
	Turn-on delay	0,0 [Seconds]
	Turn-off delay	0,0 [Seconds]
	Switch on logic	Not turned
	Position forwarding	0 [Increments]
	Select traffic light type	Green traffic light on inside of door
	Behavior in Door CLOSE end position	Continuously off
	Behavior during opening	Continuously off
	Behavior in Door OPEN end position	Continuously off
	Behavior during the clearing phase	Continuously off
	Behavior during closing	Continuously off
	Behavior at stop	Continuously off
	Behavior when there is no automatic function	Continuously off
	Command forwarding	Output permanent off

11.23 Diagnostics display

P.	[Unit] Range	Function	Description/ Note
P.910	0 ... 24	Display mode selection	With the aid of this parameter you can show the variables listed below in the display of the door controller. The following variables are displayed 0: The control sequence is displayed (Automatic) 1: [Hz] The current travel speed 2: [A] The current motor current 3: [V] The current motor voltage 4: [A] The current DC-Bus current 5: [V] The current DC-Bus voltage 6: [°C] The power stage temperature in °Celsius 7: [°F] The power stage temperature in °Fahrenheit 8: [s] The run-time of the motor during the last door operation 9: [Increments] The current position 10: [Increments] The position of the reference 11: [Dig] Channel 1 value of the absolute encoder 12: [Dig] Channel 2 value of the absolute encoder 13: [V] Current reference voltage 16: Transmission ratio from motor to encoder during opening 17: Transmission ratio from motor to encoder during closing 18: Rotation speed of the TST PD shaft *Only with TST PD* 19: Temperature of the absolut encoder TST PD 20: Battery voltage of absolute encoder TST PD 21: Number of position requisition without answere from encoder 22: Number of wrong received signs in TST PD encoder (activates also the output in P.955) 23: Radio quality of the wireless safety device in %. 24: Number of errors of the wireless safety device during the last door drive. *Settings 14 and 15 are only possible when using TST FUS.*

11.24 Error Memory

P.	[Unit] Range	Function	Description/ Note
P.920		Error Memory	The controller stores the last four errors in the error memory.
			After opening Parameter P.920:
			- Change level using OPEN and CLOSE keys
			- Opening the error memory with the STOP key
			- Closing the error memory with the STOP key
			- Exiting Parameter P.920 with Eb -
			Eb1: Error message 1 (most recent error)
			Eb2: Error message 2
			Eb3: Error message 3
			Eb4: Error message 4
			Eb5: Error message 5
			Eb6: Error message 6
			Eb7: Error message 7
			Eb8: Error message 8
			Ebcl: Clear the complete error memory
			Eb-: Exit, jump back to P.920
			🛈 *Er- in the display means that no error was entered.*

11.25 Software Version

P.	[Unit] Range	Function	Description/ Note
P.925		Software Version	This parameter displays the version of the currently used software.

11.26 Door run-Time

P.	[Unit] Range	Function	Description/ Note
P.930	[Seconds]	Motor run-time	In this parameter the time required for the last drive operation is stored.

11.27 Input Voltage Measurement

P.	[Unit] Range	Function	Description/ Note
P.940	[Volt]	Input voltage	In this parameter the amount of the currently present input voltage is displayed.

11.28 Operating Mode of the Controller

P.	[Unit] Range	Function	Description/ Note
P.980	0 ... 5	Operating mode	This parameter is used to set the operating mode for the controller. The following modes are possible: 0: OPEN and CLOSE move in self-holding (Automatic) 1: OPEN move in self-holding, CLOSE move in manual mode (partial automatic) 2: OPEN and CLOSE move in Manual mode (deadman) 3: Deadman emergency operation ⚠ **ATTENTION** **All safety devices and limit switches are ignored.** 4: Endurance test with safety devices Automatic OPEN and CLOSE operation. Before each new operation the hold-open time P.010 is in effect. 5: Endurance test without safety devices ⚠ **ATTENTION** **All safety devices are ignored.** ⓘ *The endurance test setting is lost after turning off the controller. The controller then reverts to manual mode.*

11.29 Password

ⓘ *The password is not setable on the customer level*

P.	[Unit] Range	Function	Description/ Note
P.999	0000 ... FFFF	Password	The password provides access to the various parameter levels. ⚠ **There are different parameters visible depending on the password level.** **A changing of parameters without to know there functionality is forbidden.** **In order to avoid failure and endangering because of unauthorized access passwords are only allowed to give to trained staff.**

11.30 Factory Setting / Defaults

P.	[Unit] Range	Function	Description/ Note
P.990	0 ... 1	Factory setting	By setting and saving this parameter to 1 all parameter values are restored to their original value.

12 Parameter Summary

P.	Function	Default	Changed of: at:	Page
A.F00	FSx Wireless safety system profile	0		54
P.000	cycle counter	[Cycles]		36
P.005	Maintenance counter	[Cycles]		36
P.010	Auto close time 1	10 [Seconds]		36
P.011	Auto close time 2	10 [Seconds]		36
P.025	Pre-warning time before closing	0 [Seconds]		37
P.026	Pre-warning time before closing from between the end positions	0		37
P.100	Motor rated frequency	[Hz]		37
P.101	Motor rated current	[A]		38
P.102	Power factor cos Phi	[%]		38
P.103	Motor rated voltage	[Volt]		38
P.110	Drive profile	0		38
P.130	Motor rotary field	0		38
P.140	Boost for OPEN	0 [%]		39
P.141	Start frequency of the frequency ramp stop for OPEN	20 [Hz]		40
P.142	IxR compensation for OPEN	0 [Hz]		41
P.143	Voltage reduction for OPEN	100 [%]		42
P.145	Boost for CLOSE	0 [%]		39
P.146	Start frequency of the frequency ramp stop for CLOSE	20 [Hz]		40
P.147	IxR compensation for CLOSE	0 [Hz]		41
P.148	Voltage reduction for CLOSE	100 [%]		42
P.202	Transmission ratio			42
P.205	Selecting the positioning system profile			43
P.210	New teaching of the end positions	5		43
P.215	Requesting correction of the pre-limit switch and limit switch bands	0		44
P.216	Activating auto correction / Selecting the ramp setting mode	2		44
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P.231	Correction value End position Door OPEN	0 [Increments]		48
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P.320	Creep speed frequency for OPEN	20 [Hz]		50
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P.350	Travel frequency for rapid CLOSE	40 [Hz]		45

P.	Function	Default	Changed of: at:	Page
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P.352	Acceleration of start ramp "r5"	80 [Hz/s]		46
P.360	Creep speed frequency for CLOSE	20 [Hz]		47
P.361	Duration of brake ramp "r6"	50 [10 ms]		47
P.362	Acceleration of brake ramp "r6"	40 [Hz/s]		47
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P.999	Password	0000		96
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P.A04	Function of Input 24	0107		62
P.A05	Function of Input 25	0109		62
P.A06	Function of Input 26	1002		62
P.A07	Function of input 27	0106		62
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P.F00	Activation of the wireless	0		54
P.F01	Timeout for the wireless	50 [ms]		54
P.F05	Channelgroup	1		54
P.F07	Address of the mobile unit	00000000		54
P.F09	Battery nominal voltage	3,6 [Volt]		54
P.F10	Mode input 1	0		56

P.	Function	Default	Changed of: at:	Page
P.F11	Safety	2		56
P.F12	Contact type	0		56
P.F13	Debouncing time	1		56
P.F16	Output	1		57
P.F19	LCD Messages	0		57
P.F1F	Function input 1	0000		55
P.F20	Mode input 2	0		57
P.F21	Safety	2		57
P.F22	Contact type	0		57
P.F23	Debouncing Time	1		57
P.F26	Output	1		57
P.F29	LCD Messages	0		58
P.F2F	Function input 1	0000		55
P.F30	Mode input 3	0		58
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P.F36	Output	1		58
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P.F3F	Function input 3	0000		55
P.F40	Mode input 4	0		59
P.F41	Safety	2		59
P.F42	Contact type	0		59
P.F43	Debouncing time	1		59
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P.F49	LCD Messages	0		59
P.F4F	Function input 4	0000		56
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P.FB9	LCD Messages	0		60
P.FC9	LCD Messages	0		60

13 Übersicht Fehler-Meldungen

Fehler können, sofern sie sich nicht selbständig zurück setzen, quittiert werden.

⚠️**WARNUNG**

Es muss zuerst die Ursache des Fehlers beseitigt werden, bevor die entsprechende Meldung quittiert wird.

Dazu betätigt man die (STOP) STOP-Taste und hält sie fest und drückt anschließend den NOT-AUS-Taster ein. Alternativ kann auch die (STOP) STOP-Taste für ca. 5 Sekunden betätigt werden.

Nr.	Beschreibung	Mögliche Fehlerursache
F.000	Door position too far up	• Too small a parameter value for upper emergency limit switch → enlarge P.239 • Upper limit switch range (limit switch band) too small → enlarge P.233 • Mechanical brake defective or improperly set
F.005	Door position too far down	• Too small a parameter value for lower emergency limit switch → enlarge P. 229 • Lower limit switch range (limit switch band) too small → enlarge P. 223 • Mechanical brake defective or improperly set
F.020	Run time exceeded (during opening, closing or deadman)	• 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.030	Lag error (position change of the door is less than expected)	• gate 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	• 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.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.050	Reference switch position	• Reference switch constantly tripped (defective)

Nr.	Beschreibung	Mögliche Fehlerursache
	deviates from permissible range. During cyclical synchronization	• Reference switch trips too far from the selected reference. • Reference switch trips in the limit switch band • P270 and P280 are both at the reference switch
F.051	Reference switch position deviates from permissible range.	• Reference switch lies in the limit switch band • Reference switch is beyond 15% EO • Reference switch defective
F.052	Reference switch not recognized	• The reference switch is not recognized within 20% EO during automatic synchronization after power-on • The reference switch is not recognized in the associated end position.
F.060	Breakaway recognized	• Breakaway was detected but not fixed • The automatic lead in after breakaway has failed
F.080	Fault: Maintenance is required	• Service counter has expired
F.090	Controller not parameterized	• The min. neseccary basic parameters for the controller have not yet been set → Activate DIP-switch and put in the asked parameters.
F.201	Internal E-Stop „push-button" tripped or Watchdog (computer monitor)	• E-Stop chain was interrupted starting at input „internal EStop" without parameterizing mode having been selected • Internal parameter or EEPROM checks defective, pressing the STOP key 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 edge trips for closing has reached set limit	• Parameterized, maximum number of safety edge trips during a door cycle was exceeded → To reset close the door in deadman mode
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
F.364	Safety edge testing failed	• Safety edge was not activated as expected when requesting a test. • The time between request for testing and actual testing not in agreement
F.365	Redundancy error with interruption	• 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

Nr.	Beschreibung	Mögliche Fehlerursache
F.366	Too high a pulse frequency for optical safety edge	• Defective optical safety edge • Defective input for internal safety edge
F.369	Internal safety edge incorrectly parameterized	• An internal safety edge is connected but deactivated → set P.460 to the used edge type
F.371	Number of edge trips for external safty edge has reached set limit	• Parameterized, maximum number of safety edge trips during a door cycle was exceeded
F.372	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
F.373	Fault in the safety edge (message comes from module)	• 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 bar testing failed	• Pre-limit switch for safety edge incorrectly set or defective • Processing module defective • Safety edge defective
F.385	Fault in pre-limit switch for safety edge	• Pre-limit switch for turning off the safety edge or reversing after safety edge tripping remains tripped even in the upper end position.
F.38A	Redundancy error of the 8K2 slip door switch on the second internal safety edge evaluation unit	• 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	• 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	• 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	• Parameterized, maximum number of safety input trips during a door cycle was exceeded
F.400	Controller hardware reset detected	• Excessive noise on supply voltage • Internal watchdog tripped • RAM error
F.410	Over-current (motor current or DC-bus)	• 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.420	Overvoltage in DC-bus Limit 1	• Brake chopper interference / defective / missing • Feed voltage much to high • Motor feeds back too much energy in generator mode, door motion energy cannot be sufficiently brought down
F.425	Overvoltage line supply	• The supply voltage for the controller is to high

Nr.	Beschreibung	Mögliche Fehlerursache
F.426	Undervoltage line supply	• The supply voltage for the controller is to low
F.430	Temperature cooler outside of working range Limit 1	• 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.440	Overcurrent in DC-bus Limit 1	• Boost not adjusted • Motor incorrectly dimensioned for door • Door sticks
F.510	Motor / DC-bus overcurrent Limit 2	• 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.512	Offset motor current / DC-bus current faulty	• The controller hardware is broken
F.519	IGBT driver chip detected overcurrent	• 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	• Brake chopper interference / defective / missing • Feed voltage much to high • Motor feeds back too much energy in generator mode, door motion energy cannot be sufficiently brought down.
F.521	Overvoltage in DC-bus	• 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	• 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 line supply input	• The line supply for the Controller is to high • The line supply fluctuates very extremly
F.530	Heatsink temperature outside of working range Limit 1	• 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.540	Overcurrent in DC-bus Limit 2	• Boost not adjusted • Motor incorrectly dimensioned for door • Door sticks

Nr.	Beschreibung	Mögliche Fehlerursache
F.700	Position sensing defective	For mechanical limit switches: • 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: • 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.750	Protocol Transmission error	• Defective hardware or electrically noisy environment
F.751	Synchronization FUE <-> absolute encoder	• Defective hardware or electrically noisy environment • Absolute encoder processor electronics defective
F.752	Timeout with protocol transmission	• Interface cable defective / interrupted • Channel A and B connected over cross • Absolute encoder processor electronics defective • Defective hardware or electrically noisy environment • Take a controlcable with shield • Adjust a RC element (100Ω+100nF) at the brake
F.760	Position outside of window	• Position encoder drive defective • Absolute encoder processing electronics defective • Defective hardware or electrically noisy environment
F.761	Distance Channel 1 <-> Channel 2 outside allowed window	• Position encoder drive 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	• Input 1 of the mobile unit was tested wrong • The device which is connected to the input does not work correct • The mobile unit is defective

Nr.	Beschreibung	Mögliche Fehlerursache
F.802	Wrong Test of input 2 of the mobile unit TST FSx	• Input 2 of the mobile unit was tested wrong • The device which is connected to the input does not work correct • The mobile unit is defective
F.803	Wrong Test of input 3 of the mobile unit TST FSx	• Input 3 of the mobile unit was tested wrong • The device which is connected to the input does not work correct • The mobile unit is defective
F.804	Wrong Test of input 4 of the mobile unit TST FSx	• Input 4 of the mobile unit was tested wrong • The device which is connected to the input does not work correct • The mobile unit is defective
F.80A	Wrong Test of input A of the stationary unit TST FSx	• 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
F.80B	Wrong Test of input B of the stationary unit TST FSx	• 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	• 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 of output 1 of the stationary unit TST FSx	• The output 1 of the stationary unit was tested wrong • The cable between stationary unit and controller is broken or not connected • The stationary unit is defective • Parameter P.Fxb, P.47b or P.465 wrong adjusted
F.812	Wrong Test of output 2 of the stationary unit TST FSx	• The output 2 of the stationary unit was tested wrong • The cable between stationary unit and controller is broken or not connected • The stationary unit is defective • Parameter P.Fxb, P.47b or P.465 wrong adjusted
F.813	Wrong Test of output 3 of the stationary unit TST FSx	• The output 3 of the stationary unit was tested wrong • The cable between stationary unit and controller is broken or not connected • The stationary unit is defective • Parameter P.Fxb, P.47b or P.465 wrong adjusted
F.821	Wrong parameter setting input 1 of mobile unit	• 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	• 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	• 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	• The device which is connected to input 4 of the mobile unit does not fit to the settings • Check Parameter P.F4F

Nr.	Beschreibung	Mögliche Fehlerursache
F.831	Disturbed input 1 of mobile unit TST FSx	• 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	• 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	• 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	• 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	• The connected optical safety sdge is faulty
F.843	Frequency error on input 3 of mobile unit	• The connected optical safety sdge is faulty
F.920	Internal 2.5 V reference voltage incorrect	• Hardware defect
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.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.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	• UserSTack or SystemStack overflowed • Possible software error due to recursive invocations (e.g. profile)
F.960	Wrong 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

Nr.	Beschreibung	Mögliche Fehlerursache
F.970	Plausibility Param.block error	• New EPROM version • Controller not yet initialized • Some parameter is implausible

14 Information 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 ᵈ	**closing active**
ˉEoˉ	**upper limit position Eo**
≡Eo≡	**upper limit position locked ->** closing not possible (e.g., safety edge)
ᵈAUF	**opening active**
-E1-	**middle limit position E1 (intermediate stop position)**
≡E1≡	**middle limit position locked ->** closing not possible (e.g., safety edge)
FAIL	**fault ->** only deadman travel is possible, automatic opening may also be possible
EICH	**calibration ->** setting the limit positions in deadman travel mode (for absolute encoder) à Start procedure using STOP key
≡NA≡	**E-stop ->** Travel not possible, hardware safety chain interrupted
NOTF	**E-travel ->** Deadman travel without regard for safety facilities, etc.
'Hd'	**manual ->** Deadman mode
ParA	**parameterization**
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
FU3E / FUE	Initial display after power up (**Power Up and self-test**)

Status messages during calibration	
E.i.E.u.	calibration of the lower limit position requested (in deadman travel)
E.i.E.o.	calibration of the upper 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.u.	synchronization of lower limit position requested (deadman or wait for starting condition)
S.y.E.o.	synchronization of upper limit 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 (STOP)

Status messages during dead man movement	
Hd.cL	deadman closing (membrane key: CLOSE)
Hd.oP	deadman opening (membrane key: OPEN)
Hd.Eu	lower limit position reached, no further deadman closing possibl
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 automatic operation	
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 aktiv
I.161	Priority not 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.200	Reference corrected
I.205	Reference position encoder
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.510	Correction drive finished
I.515	Active correction drive
I.520	Pre set speed for open or close drive not reached
I.555	Measuring rotation factor not ready

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.121	Input 21
E.128	Input 28
E.129	Input airlock open from extension board

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	activation of internal safety edge
E.363	internal safety edge fault
E.370	activation of external safety edge
E.373	external safety edge fault
E.379	external safety edge activated but not yet plugged in

Wireless plug-in module	
E.401	wireless Channel 1
E.402	wireless Channel 2

Inductive loop detection – plug-in module	
E.501	Detector channel 1
E.502	Detector channel 2

Internal inputs	
E.900	Controller chip fault signal

Input WiCab	
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

15 Specifications

	TST FU3E	**TST FUE**
Dimensions of case (W x H x D):	300x400x120mm (excl. wall bracket)	300x400x120mm (excl. wall bracket) or : 300x300x120mm (excl. wall bracket)
Installation:	Vertical using wall bracket on housing bottom	
Supply voltage (power line):	terminal L1,L2,L3: 3~200…480 VAC ±10%, 50…60 Hz alternatively L2, L3: 1N~200…480 VAC ±10%, 50...60 Hz On-site fuse: 16A K-type	terminals L, N: 1N~180...240 VAC ±10%, 50...60 Hz On-site fuse: 16A K-type
Controller internal power consumption:	max. 50W fully assembled and with motor not running	max. 40W fully assembled and with motor not running
External supply voltage 1 (depending on supply):	terminal L3': corresponds to terminal voltage applied to L3 (fused on the circuit board: F204 / 2,5 AT)	Terminal L1: corresponds to terminal voltage at terminal L (fused on the circuit board: F202 / 3.15AT)
Control voltage / external supply 2:	24 VDC regulated (±5% at nominal voltage 230 V) max. 500 mA incl. optional plug-in modules. 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. 150mA	
Control inputs 1-8:	24 VDC / typ.15 mA, max. 26VDC / 20mA all inputs must be connected potential-free or: < 5 V: inactive -> logical 0 > 7 V: active -> logical 1 min. signal duration for input control commands: > 100 ms galvanically isolated via optocouplers on the circuit board	
Inputs INK 1 and INK 2 (IN 9 and 10):	< 5 V: inactive à logical 0, > 16 V active à logical 1 For two 24V active 90° offset pulse inputs, max. 20mA load. Limit frequency: 1kHz	
Serial interface RS485 A and B:	only for electronic limit switches RS485 level, terminated in 100Ω	
Safety chain / E-STOP (Terminal: emergency stop ext. 1/2 and 3/4):	all inputs must be connected potential-free Contact load capacity ≥ 26 VDC / ≥ 120 mA. when safety chain is interrupted, no movement of the drive is possible, not even in deadman mode Factory setting: not jumpered	
Safety edge input:	for electrical safety edges with 1.2kΩ or 8.2kΩ termination resistor and for dynamic optical systems.	
Relay outputs:	**when inductive loads are being controlled (e.g. additional relays or brakes) they must be equipped with appropriate suppressors (free-wheeling diodes, varistors, RC elements)**	
Relay K3: Standard brake relay:	Changeover contact for enabling electromechanical brakes with interposed brake rectifier. 230VAC / 3A.When the EMERGENCY-STOP is tripped, the brake relay is deactivated immediately.	
Relays K4 and K5 "Fault / Door position messages / Lamp functions	Changeover contact potential-free min. 10mA max. 230VAC / 3A.	⚠ **Attention** **Relays may only be connected to voltages having the same reference potential. Contacts used for power switching can no longer be used to switch low currents.**
Drive output:	for drives up to 2.2kW (version –A), 4KW (version –C) or 5 kW (version -F) at 400V Motor constant current at 100% duty factor and 40°C ambient temperature or Motor constant current at 60% duty factor and 50°C ambient temperature: version –A: 5 A, version –C: 10 A, version -F: 12 A Momentary overload capacity up to 15A resp. 22A for 0.5s Max. length of motor cable: 30m	For drives up to 0.75kW (Version –A) resp. 1,5KW (Version –C) at 230V Motor constant current at 100% duty factor and 40°C ambient temperature: 5A Motor constant current at 60% duty factor and 50°C ambient temperature: 5A Version –A: 5A:, Version –C: 10A Short-time overload capacity up to 15A resp. 22A for 0.5s Max. length of motor cable: 30m
Brake resistance load (optional):	max. 1.5KW for max. 0.5 seconds. Repetition rate min. every 20 seconds.	⚠ **Attention** **the heat sink and braking resistor on the rear of the enclosure can reach temperatures of up to 85°C. In case of failure this can reach 280 °C (<5 min.)!**
Temperature range: Operating: Storage:	-10...+50°C -25...+70°C	
Relative humidity:	up to 80% non-condensing	
Vibration	low-vibration installation, e.g. on a concrete wall	
Protection class:	IP54 (only in respect of enclosure)	
Weight:	approx. 6,5 kg	
Equipment mobility:	stationary	
Equipment type:	motor appliance, external motor is not part of the delivery from FEIG ELECTRONIC GMBH	
Protection class:	Protection clas 1	

Baumuster geprüft nach:	Normen:

Machinery Directive:
 	
Add-on for TST FU3E:
	➔ device complies with Annex IV categories of machinery - Section 21: "logic unit for safety functions"
	
	"EN ISO 13849-1:2008 Safety of machinery – safety-related parts of control systems – part 1: General design principles
	• Category: 2
	• Performance Level (PL):
	• Safe functions:
	  o Endpoint detection
	  o Contacting edge evaluation (8,2/1,2 kΩ or optical)
	  o photoelectric beam incl. pull-in protection (comp. EN 12453 table 1: type D or type E with test)
	  o Slip door switch
	  o Slack rope switch
	EN 61508:2002 Functional safety of safety-related electrical/electronic/programmable electronic control systems
	• Safety integrity level (SIL): 2

Low-Voltage Directive: 2006/95/EEC	EN 60335-1:2007 Safety of electrical appliances for household and similar use / Part 1: general requirements • Type: stationary motor-driven machines • Protection class 1 EN 60335-2-103:2003 Safety of household and similar electrical appliances - part 2-103: Special requirements for drives for industrial gates, doors and windows
EMC Directive: EMC 2004/108/EEC	Electromagnetic compatibility – basic technical standards: EN 61000-6-1:2007 interference immunity, living area EN 61000-6-2:2006 interference immunity, industrial area EN 61000-6-3:2007 Electromagnetic radiation, living area EN 61000-6-4:2007 Electromagnetic radiation, industrial area
Applied national specifications regarding the above directives:	EN 12453:2001 Safety in use of power operated doors - Requirements • Chapter 5.2 Drive Systems and Power Supply

FEIG ELECTRONIC GmbH
Lange Straße 4
D- 35781 Weilburg

EC Declaration of conformity
in accordance with the EC Machinery Directive 2006/42/EC, Annex II A

We declare that the machine

Description	**Gate controller with integrated frequency converter**
Type/trade name	**TST FU3E**

complies with the den the relevant provisions of the following directive:

Machinery Directive	2006/42/EG
EMC Directive	2004/108/EG
Low-Voltage Directive	2006/95/EG

Applicable harmonized standards:

EN ISO 13849-1: 2008	Safety of machinery – safety-related parts of control systems
EN 61508:2002	Functional safety of safety-related electrical, electronic and programmable electronic control systems
EN 60335-1:2007	Safety of household and similar electrical appliances
EN 60335-2-103:2003	Safety of household and similar electrical appliances - Special requirements for drives for industrial gates, doors and windows
EN 61000-6-1:2007	EMV: Minimum Technical Standard – immunity to interference (living quarters)
EN 61000-6-2:2006	EMV: Minimum Technical Standard – immunity to interference (industrial sector)
EN 61000-6-3:2007	EMV: Minimum Technical Standard – electromagnetic radiation (living quarters)
EN 61000-6-4:2007	EMV: Minimum Technical Standard – electromagnetic radiation (industrial sector)

Applied national technical standards and specifications:

EN 12453:2001	Safe use of power operated doors - Requirements Chapter 5.2 drive systems and power supply

Authorized representative for the compilation of the relevant technical documentation:

Weilburg, 04. August 2010

Eldor Walk, Technical manager

The examination of the type of machine for compliance with the requirements of the EC Machinery Directive was carried out by the

TÜV NORD CERT GmbH
Langemarckstraße 20, D-45141 Essen, Notified Body ID. No.: 0044
Reg.-No.: 44 780 10 368433

This test laboratory is responsible in accordance with Annex XI of the EC Machinery Directive!

This declaration certifies compliance with these regulations, however, it does not entail any warranted qualities. The accompanying product documentation and in particular the safety instructions must be observed.

Commissioning of the gate controller is prohibited until it has been installed on a gate and this gate complies with the provisions of the EC Machinery Directive.

FEIG
ELECTRONIC

$C\epsilon$

EG-Konformitäts-Erklärung
Declaration of conformity

Hiermit bescheinigt das Unternehmen / *The company*

FEIG ELECTRONIC GmbH
Lange Straße 4
D- 35781 Weilburg

die Konformität des Produkts / *herewith declares conformity of the product*

Bezeichnung / *Designation*:	**Torsteuerung**
Typ / *Type:*	**TST FUE-2**
Variante / *Version:*	**-A, -C, -D, -E, -F und -G**

mit folgenden einschlägigen Bestimmungen / *with applicable regulations below*

EG-Richtlinie / *EC directive*

EMV-Richtlinie: mit Änderungen	**89/336/EWG**
Niederspannungsrichtlinie:	**2006/95/EG**
Maschinenrichtlinie mit Änderungen	**98/37/EG**

Angewendete harmonisierte Normen / *Harmonized standards applied:*

EN 12453 / 02.2001	: Nutzungssicherheit kraftbetätigter Tore -Anforderungen
EN 12445 / 02.2001	: Nutzungssicherheit kraftbetätigter Tore –Prüfverfahren
EN 12978 / 09.2003	: Tore–Schutzeinrichtungen-Anforderungen-Prüfverfahren
EN 60335-1 / 02.2007	: Sicherheit elektrische Geräte für den Hausgebrauch
EN 61000-6-1 / 08.2002	: EMV: Fachgrundnorm – Störfestigkeit (Wohnbereich)
EN 61000-6-2 / 02.2005	: EMV: Fachgrundnorm – Störfestigkeit (Industriebereich)
EN 61000-6-3 / 08.2002	: EMV: Fachgrundnorm – Störaussendung (Wohnbereich)
EN 61000-6-4 / 08.2002	: EMV: Fachgrundnorm – Störaussendung (Industriebereich)

Weilburg, 03.März.2008   Eldor Walk, Technischer Leiter

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