FEIG ELECTRONIC

CONTROLLER

Intelligent Door Management

Assembly instructions

Installation, commissioning, utilization and maintenance

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.

Attention

Important Safety Information

These instructions must be observed to ensure personal safety.

Store these instructions safely.

Notes

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

This Manual is directed specifically at persons involved with commissioning the **TST WU** 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 controller's 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 favourable general conditions. FEIG ELECTRONIC GmbH assumes no liability for the proper operation of the equipment in third-party environments.

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

General information about this document

Language of the original operating instructions: German

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

Attention

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

Warning

indicates that the controller is at risk.

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

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

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ES ATENCIÓN INDICACIONES IMPORTANTES DE SEGURIDAD
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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

Contents

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 WU** is designed to handle electrical induction motors with a power consumption of up to 2.2 kW and a 400V supply.
In addition to controlling the motor that drives the door, the controller can be used for the following tasks:

- Positioning the door at and between its final positions (open, close and intermediate positions)
- Evaluation of the security sensors on the door (e.g. safety edge monitoring, pull-in protection, etc.)
- Evaluation of additional safety equipment on the door (e.g. photo eyes, light curtains, etc.)
- Evaluation of control circuits at the door (e.g. pull switch, radio, inductive loops, etc.)
- Evaluation of emergency stop controls
- Electronically protected 24V low-voltage power supply for sensors and control devices
- 230 V power supply to external units
- Control of application-specific outputs (such as relays for door position reporting)
- Generation and output of diagnostic messages
- Configuration of application-specific parameters for different levels of access of the different user groups
- Control of input/output expansion modules
    - TST SFFE: plug-in module wireless remote control
    - TST SUVEK: plug-in module for inductive loop detection
    - TST RWU: Input / output expansions incl. ports for lockage applications, etc.
    - TST LCD/clear text: clear text display with 2 x 16 characters
    - TST SUKS-A: safety edge evaluation board
    - TST FSx: wireless Security System

2 Safety information

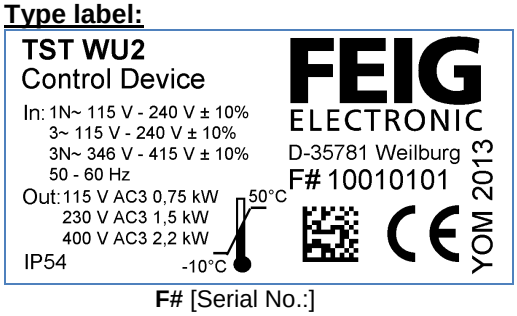
Attention

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 doors or at the drive units for doors or bring them together.** The respective safety requirements for the entire door (machine) must be aligned with the possibilities to meeting these safety requirements on the controller.
- Improper integration of the controller into the door complex – e.g. missing sensors, incorrect parameters, speed set excessively high, etc. – presents the risk that the door is operated without adequate safety precautions.
- To comply with the safety function according to EN 13849, a position encoder certified for PL c must be used.
- If an error occurs, a contactor may be turned on permanently!
- In order to avoid hazards due to a defective or sticking contactor, a mechanical stop must be installed in the end positions for all gate types
- If an error occurs, the motor may be live even if it has been turned off!
- It is forbidden to operate the contactors manually. If the protective foil is destroyed, the guarantee is void.
- **Commissioning of this controller is prohibited until it has been properly attached to the door that conforms with the EC Machinery Directive and for which an EC declaration of conformity according to Annex II of the Directive was obtained.**
- The following information describes standard applications that may not necessarily match the actual application. The actual application is provided by the manufacturer of the door as part of the overall documentation or as part of the operating instructions of the door.
- **Any installation, startup and maintenance work must only be performed by qualified specialists.** In particular, the following regulations must be observed : VDE0100, EN 50110 (VDE0105), EN 60204 (VDE0113), EN 50178 (VDE0160), EN 60335 (VDE0700), fire protection codes, accident prevention regulations as well as the relevant regulations for industrial doors and machine safety standards (EN ISO 13849, EN 62061)(ZH1/494, EN12453, EN12978)
- This device is not intended for use by persons (including children) with limited physical, sensory or mental abilities or with a lack of experience and / or knowledge, unless they are supervised by a person responsible for their safety or if they have received instructions on the use of the device. Children should be supervised to ensure that they do not play with the device. Keep remote controls away from such persons.
- A device mark (nameplate with name and address of the manufacturer, serial number, model number, supply voltage and temperature range) must be applied by the user.
- The example of the warning label must be attached to the motor near the motors terminal board

Type label:



F# [Serial No.:]
YOM [Year of manufacture Serial No.:]

Warning notice label (example)

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

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

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

3 Safety functions in accordance with EN 12453:2017

EN 12453:2017 places special requirements on safety-related signals. These signals must comply with a minimum of PL “c”, cat. 2 in accordance with EN 13849-1. To guarantee these safety requirements, the complete chain of sensors, actors and if necessary, the wiring must be taken into account accordingly. This affects (amongst others):

- Path restriction units (limit switch)
- Actuators with automatic reset
- Slack rope switches
- Slip door switches

To comply with these standard requirements, these signals can be connected via the Emergency-Stop inputs of the controller (terminal no. 31-32 and 41-42).

Alternatively, standard digital inputs can be used. In this case, an additional output must be configured as a test output and integrated in the signal chain.

3.1 Connection example testing

In this example, the testing is described using a transmitter-receiver light barrier.

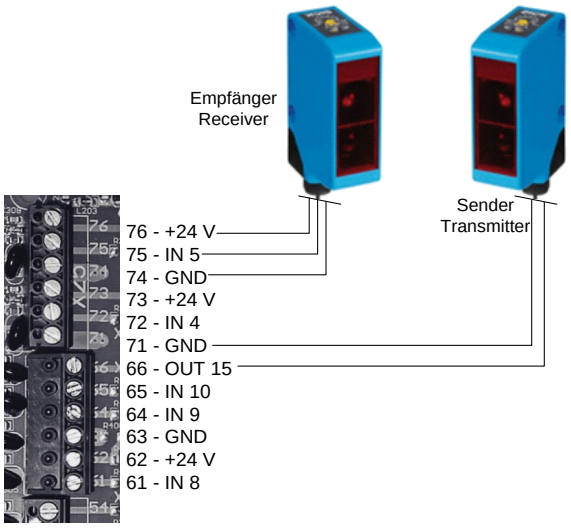
The transmitter is supplied with 24 V via a test output.

In a test case, the output is switched off so that the transmitter is voltage-free.

The receiver now switches the input.

The controller checks whether the input really switches and switches back.

If YES, the test was successful, if NO, error F.928 is set.



Both digital outputs and relays can use used as a test output.

3.2 Configuration

To activate the function testing, inputs and a relay must be configured for testing.

Input configuration P.5xA:
P.5xA = 0: No testing activated
P.5xA = 1: Testing the input upon reaching the end position OPEN and after activation
P.5xA = 2: Testing the input upon reaching the end position CLOSE and after activation

X = number of the input to be configured

Configuring the output P.7x0:
P.7x0 = 17: Testing in the end position CLOSE
P.7x0 = 25: Testing in the end position OPEN

Relays switched if testing inactive.
X = number of the outputs to be configured.

4 Installation of the controller

Attention

Important instructions for safe installation.

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

- When installing the controller, the system must be turned off.
- The controller may be opened only if all the poles of the supply voltage have been turned off. It is not permitted to turn on or to operate the controller when it is open.
- Disconnect all supply circuits before opening the housing for access to the terminals.
- Before the installation, check the controller for transport or other damages. Under some conditions a damaged controller may result in significant consequential damage to the controller as well as hazards to the user.
- The controller must never be operated with a damaged membrane keypad or 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 the supply voltage can be cut all poles by an installed main switch. The main switch and the CEE-plug must be within easy reach.
- A not rotating motor is no indication of the galvanic isolation from the power grid! The line supply connection terminals, motor terminals and terminals for the brake resistor can still carry dangerous voltages, e.g. under stop or emergency stops.
- If the supply cable is damaged, it must be replaced by the manufacturer or another qualified person in order to avoid danger (like connection type Y EN 60335-1)
- When moving the door in deadman mode, ensure that the operator has an unobstructed view of the door area. In this mode, safety equipment such as safety edge and photo eye may have been defeated. If this is not possible for structural reasons, you must ensure that this mode is only accessible to appropriately trained personnel or that the feature is disabled altogether.
- To prevent damage to the keypad, do not use pointed objects to operate the keys. The keypad is only designed to be operated by human fingers.
- Depending on the type of the door it may be necessary that the door can only be operated when it is within visual range. In these cases, no remote control (e.g. wireless) may be used to issue pulses.

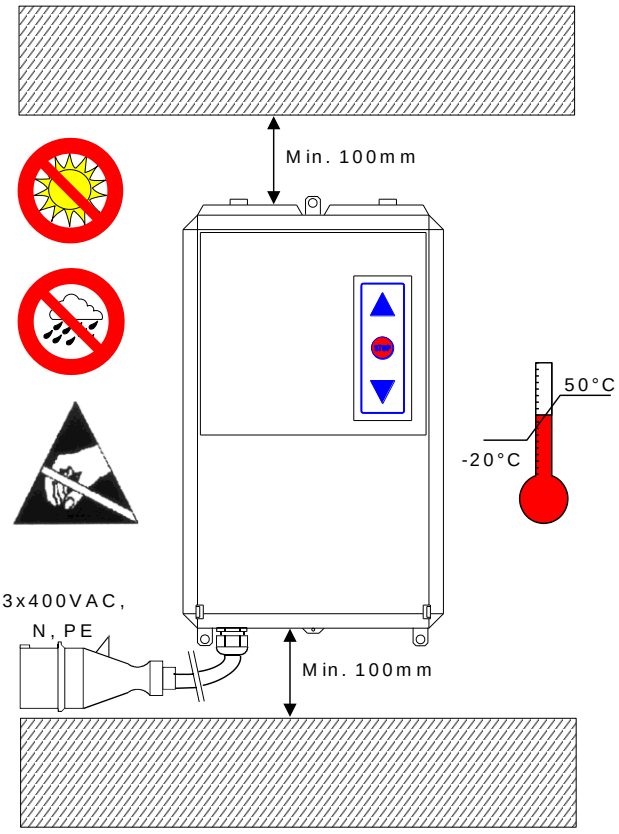


Fig. 1: Installing the controller

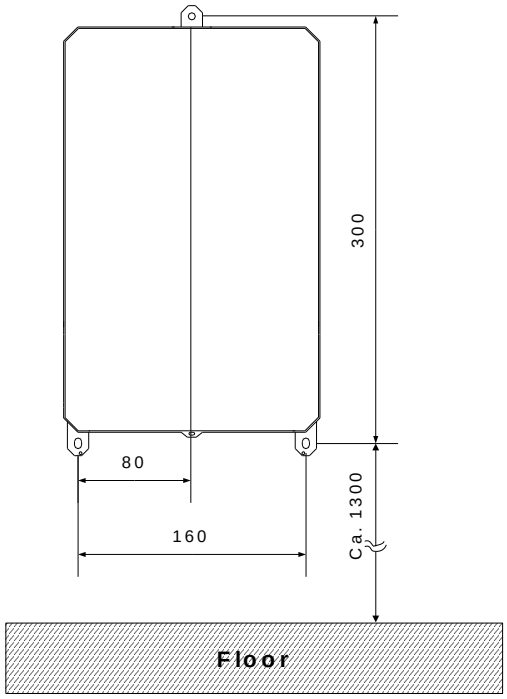


Fig. 2: Hole pattern

5 Electrical connection

Attention

- Any wiring, testing and maintenance work on an open controller shall only be performed when power has been turned off. Pay particular attention to the points shown under "Safety information".
- The controller must never be operated while it is open.
- When the controller has been turned off, dangerous voltage levels are still present for up to 2 minutes.
- Touching electronic components is dangerous due to residual voltages.
- Never operate the controller while the cover is removed.
- When the installation was completed, check that the system was configured correctly and that the safety system works properly.
- The controller may be opened only if all the poles of the supply voltage have been turned off. It is not permitted to turn on or to operate the controller when it is open.
- Never operate the controller without having connected the protective earth conductor. The absence of a protective earth conductor will result in hazardous voltages on the controllers housing caused by terminal capacitances. The RFI filters integrated into the controller may increase the leakage current up to a max. of 7 mA (see DIN EN 60335-1 section 16.2). Prior to delivery, the manufacturer will test individual units in this respect.
- Hazardous voltages remain stored in the intermediate circuit capacitors for up to 1/2 minutes after power has been turned off. The discharge time until voltages fall below 60VDC is a maximum of 1 minute. Touching internal controller components within this discharge time is hazardous.
- A defective switching power supply can considerably increase the discharge time of the DC-bus capacitors before reaching a voltage less than 60VDC. In this case, discharge times of up to 10 minutes may be possible.
- The processor circuit is galvanically connected to the power line. Important: when taking measurements on the processor circuit, do not use test equipment with PE reference to the measuring circuit.
- The controller must never be operated with a damaged membrane keypad or 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 photo eye are defeated.
- Parameter settings and the function of the safety devices must to be checked. Parameter settings and insertion of jumpers shall only be performed by properly trained persons.

WARNUNG

- 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 controller.
- 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.
- Fast running plastic foil 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.
- Connecting cables or wires must only be installed in the designated area on the upper right edge of the board. Avoid combining control circuits (24 V) and power wherever possible.
- Maximum connection diameters for the terminals on printed circuit boards

	single wire (rigid)	fine wire (with/without wire end ferrule)	Max. tightening torque [NM]
motor terminals	2,5	2,5	0,5
Line supplies	2,5	1,5	0,5
screw terminals (catch 5 mm)	2,5	1,5	0,5
plug in terminals (catch 5 mm)	1,5	1,0	0,4
plug in terminals (catch 3,5 mm)	1,5	1,0	0,25

5.1 Installation position of the cover

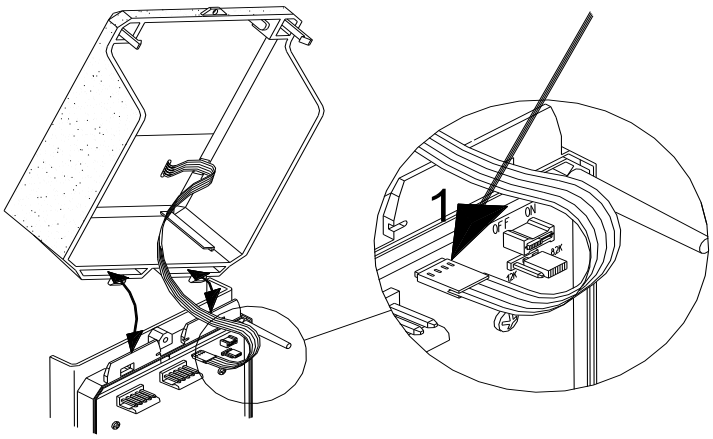


Fig. 3: Installation position of the cover, Foil keyboard connection

5.2 Power supply connection

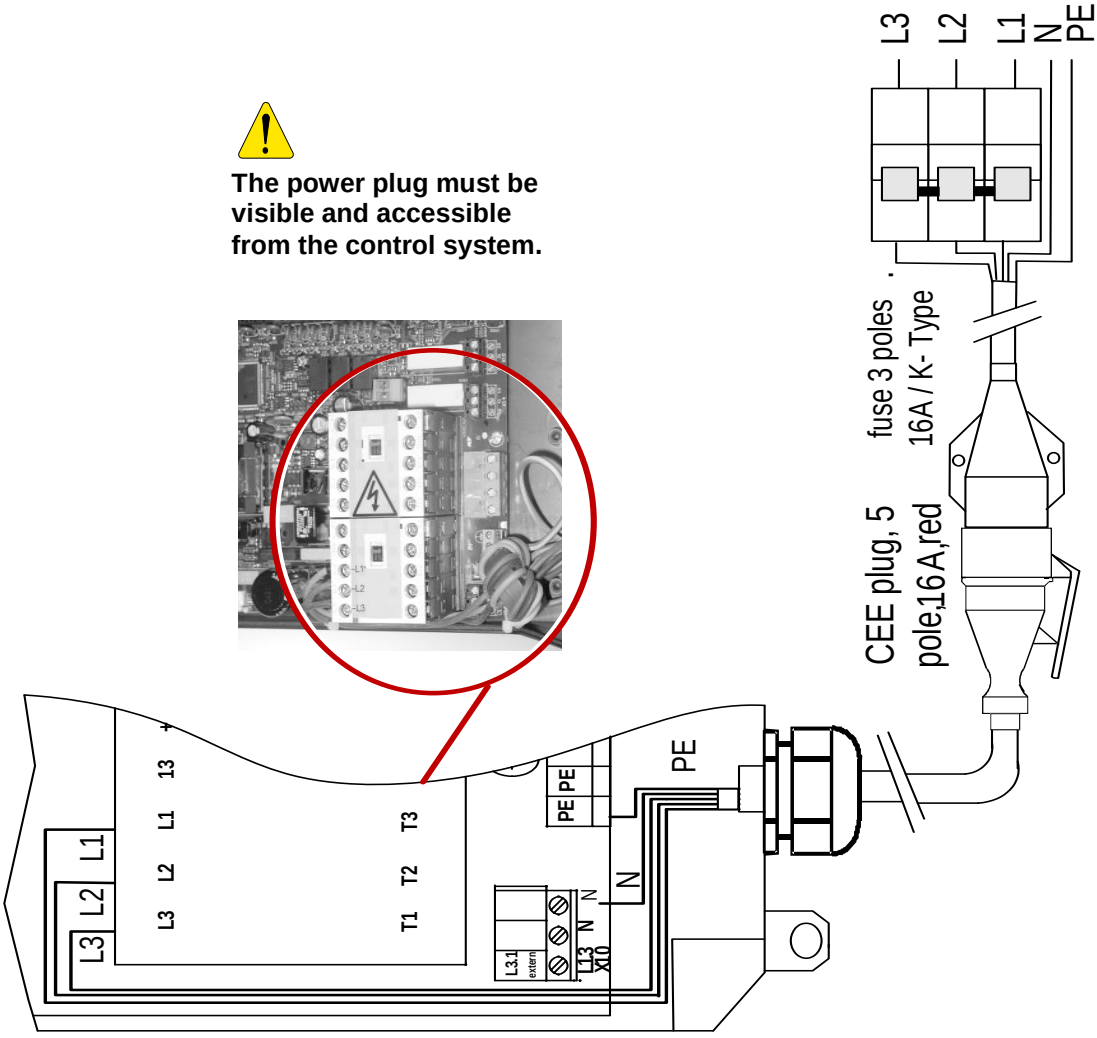


Fig. 4: Connecting the power cable

5.3 Motor and brake connections

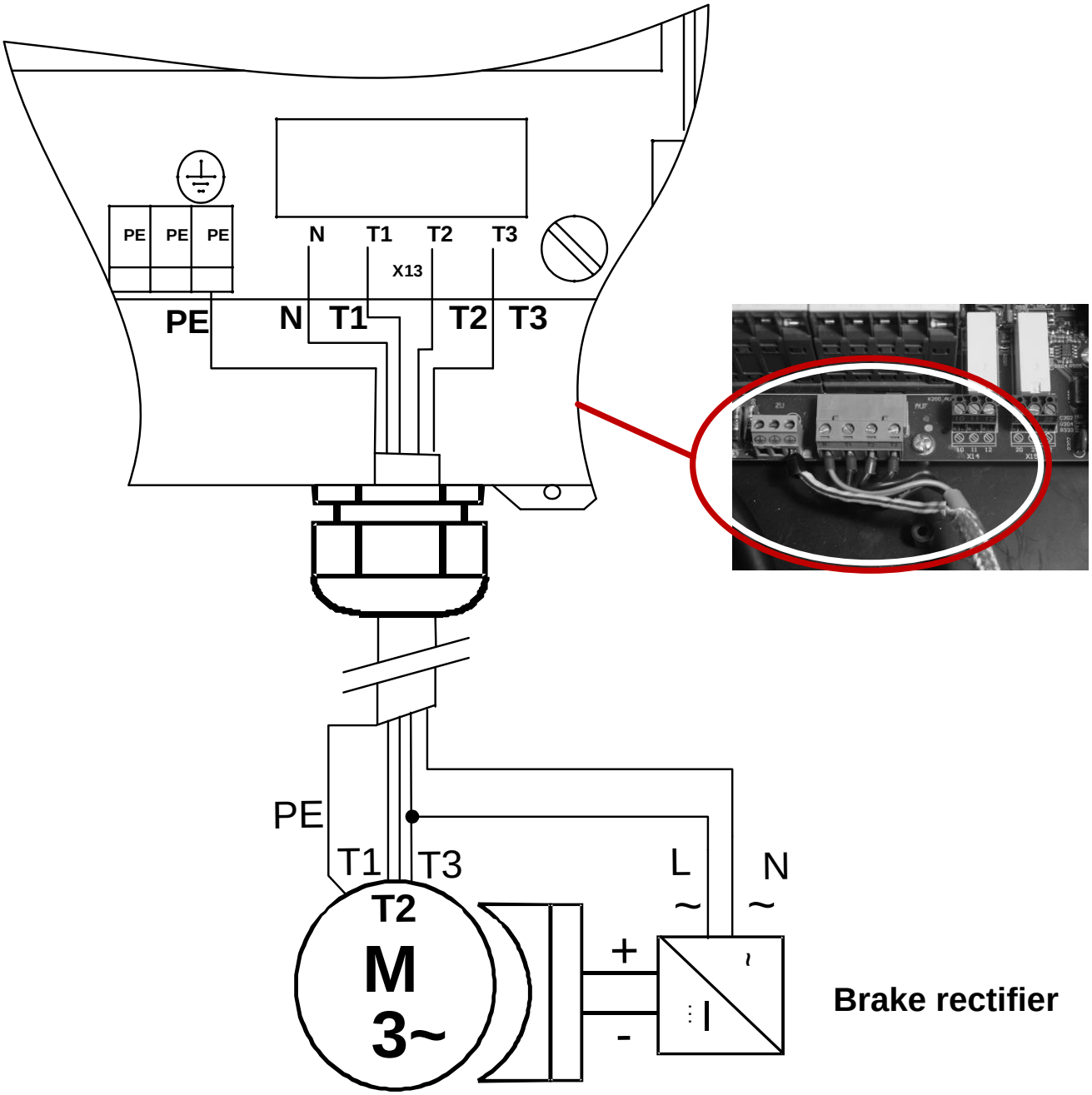


Fig. 5: Motor connection

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.

5.4 Connection for safety edge

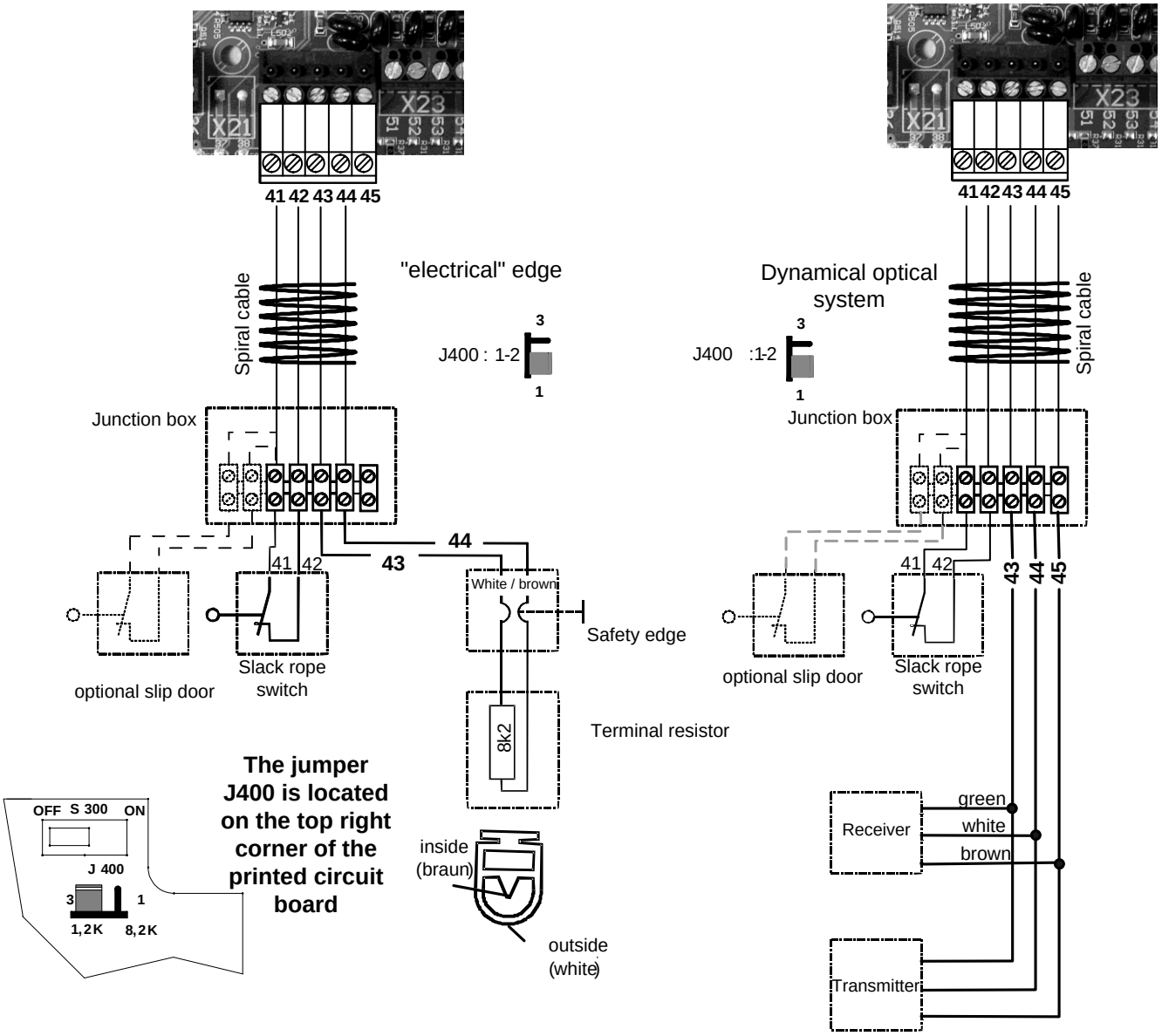


Fig. 6: Connection for safety edge

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.

5.1 Light curtain TST LGB

The light curtain TST LGB may be used as a sole safety device. It should be noted that the door plate covers the light lines of the light curtain. The light curtain also enables an automatic learning for the lower limit position.

The TST LGB may also assume other functions. In These cases further safety devices are to be installed.

5.1.1 Mounting the TST LGB

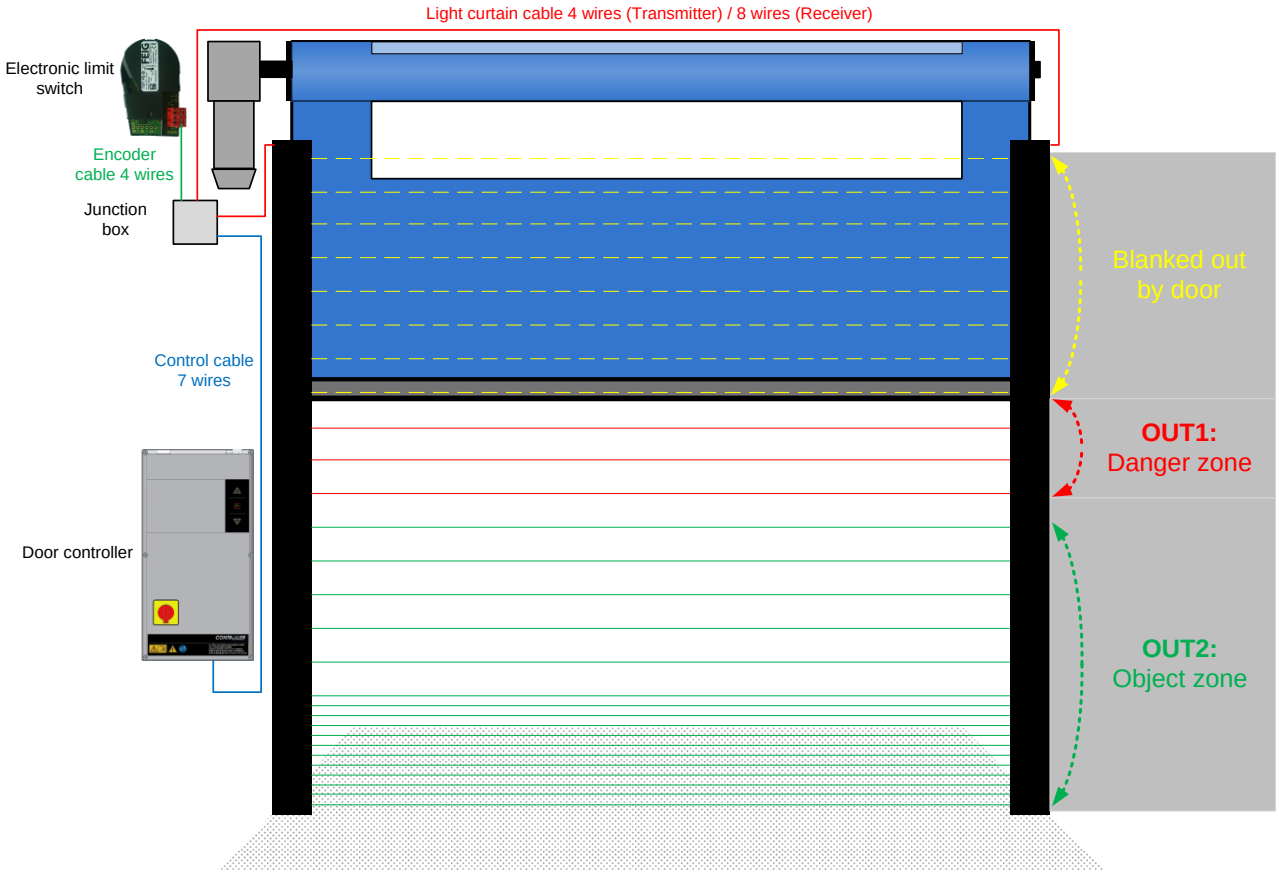


Fig. 7: Wiring sample

5.1.2 TST LGB Connection

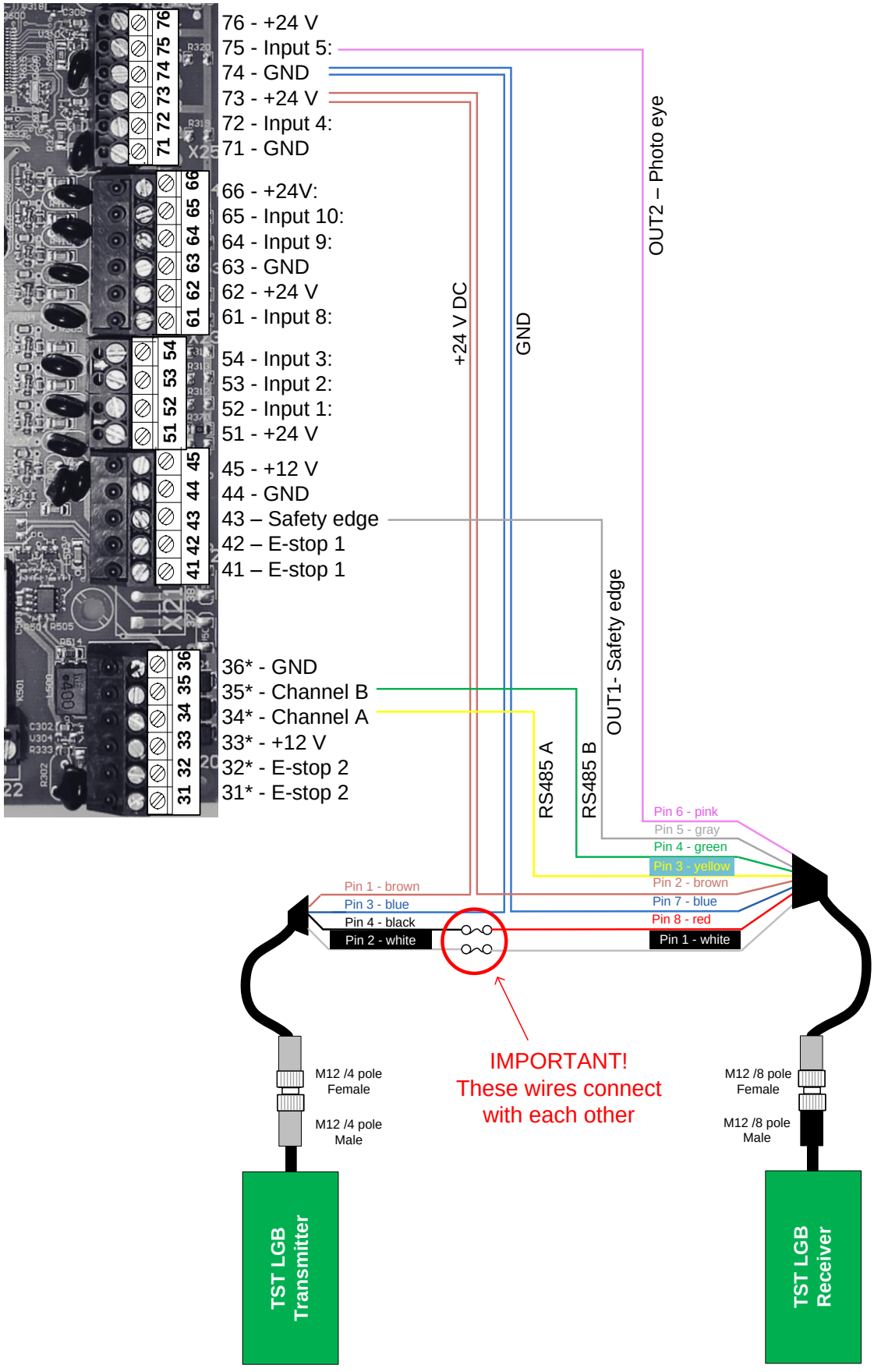


Fig. 8: TST LGB Connection

5.2 Limit switch connection

Different limit switch systems can be used with the TST WU gate control system.
For example, you can use an absolute encoders as limit switches or mechanical cam limit switches.

Attention

Requirements placed on safety-related signals Compliance with the safety function in accordance with EN 12453:2017 requires the use of a position encoder with PL "c", minimum cat. 2 in accordance with EN 13849-1.

5.2.1 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 TST FSBM must be mounted on the door leaf.

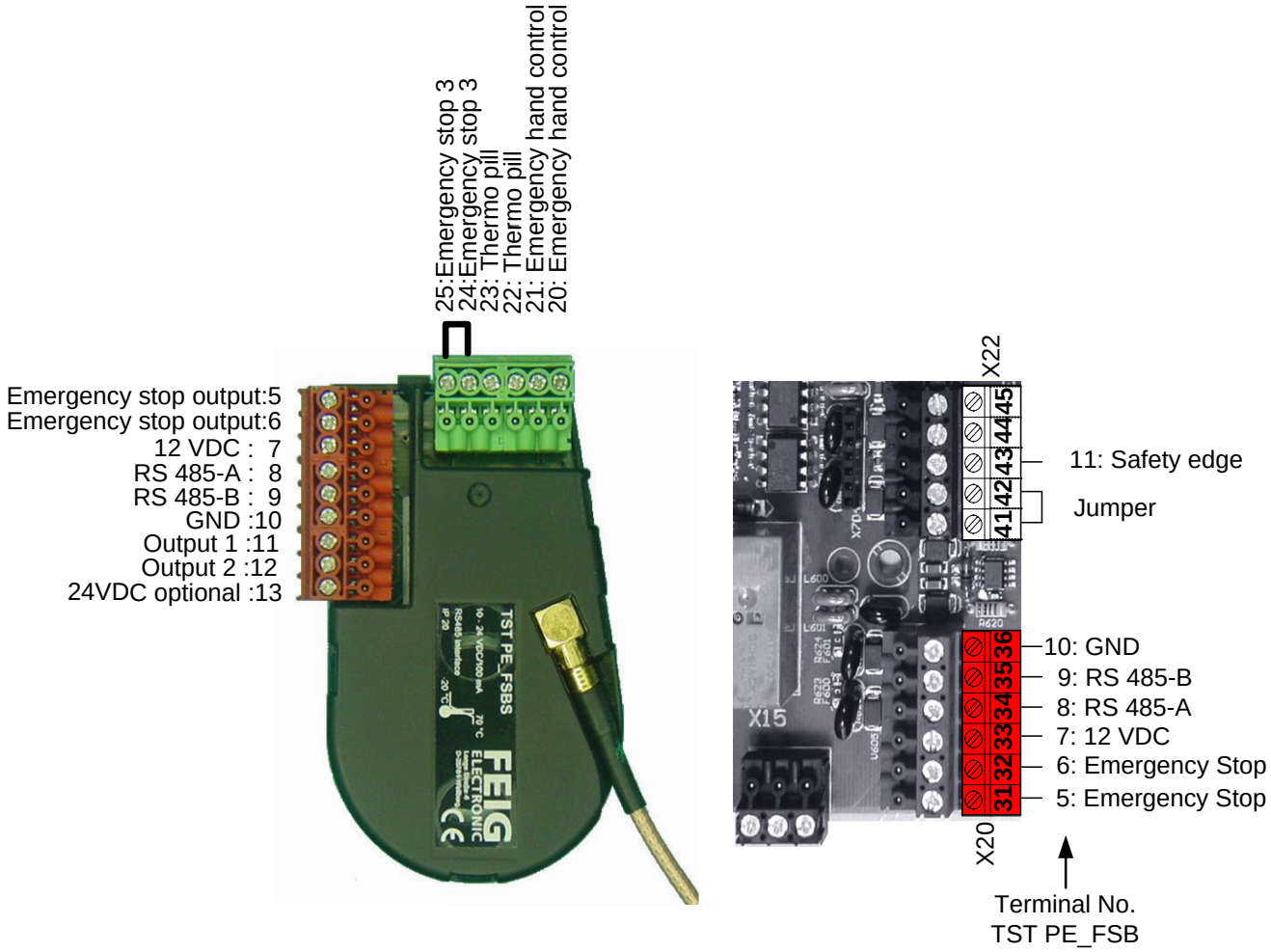


Fig. 9 Absolute encoder TST PE FSB

5.2.2 Absolute encoder TST PD

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

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

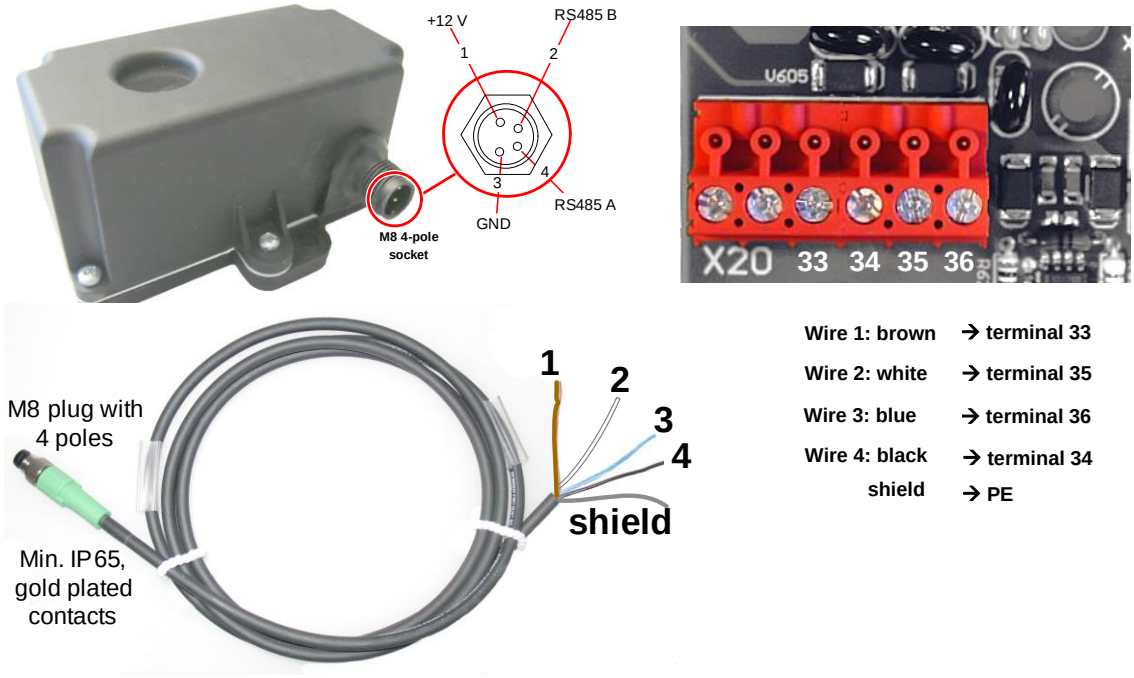


Fig.10: Connection of absolute encoder TST PD

5.2.3 Absolute encoder DES

Example of use!
Please also observe the information in chapter 3 Safety functions in accordance with EN 12453:2017 on page 8.

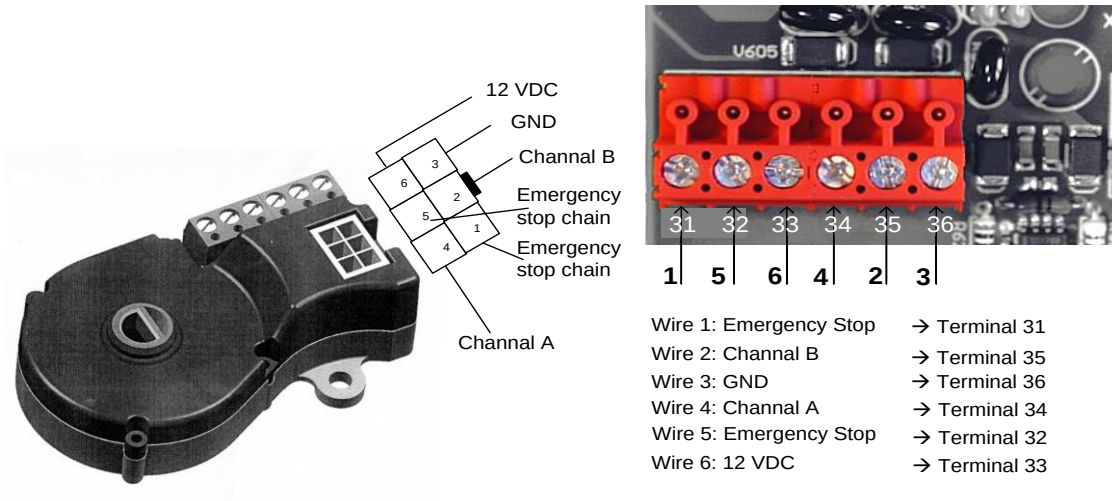


Fig 11: Connection of absolute encoder DES

5.2.4 Mechanical limit switches

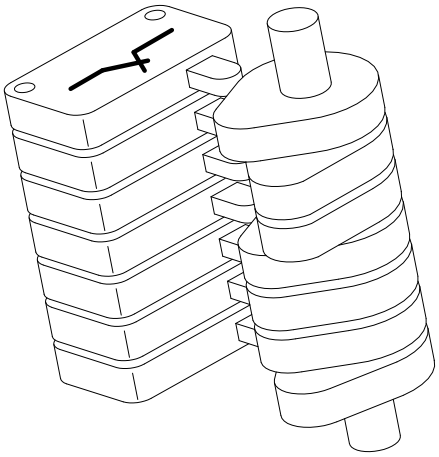


Fig. 12: Cam switch

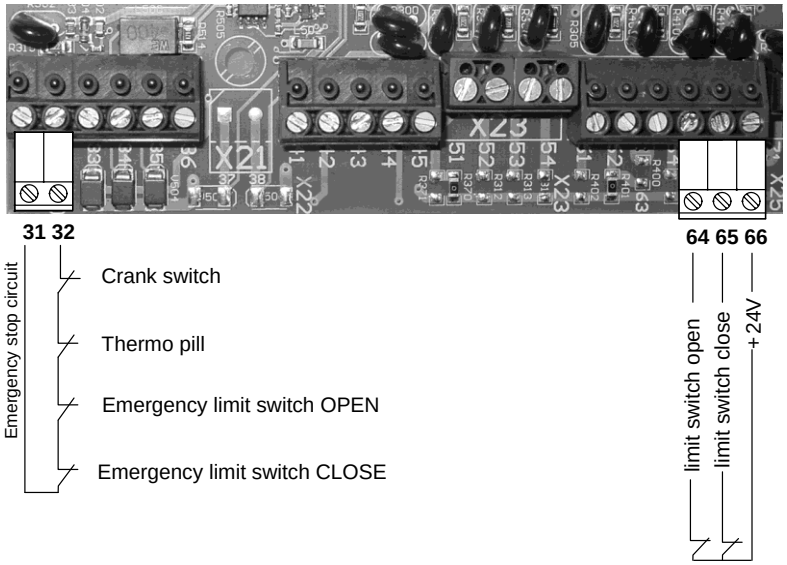


Fig. 13: Connecting cam switches

5.3 Photo eye

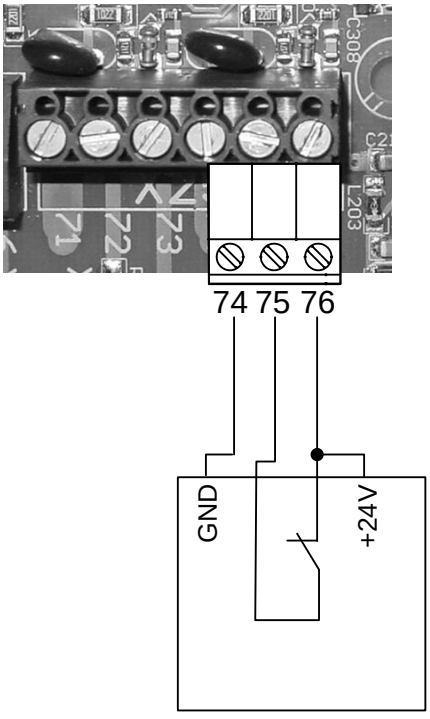


Fig. 14: photo eye connection

5.4 External triggering devices

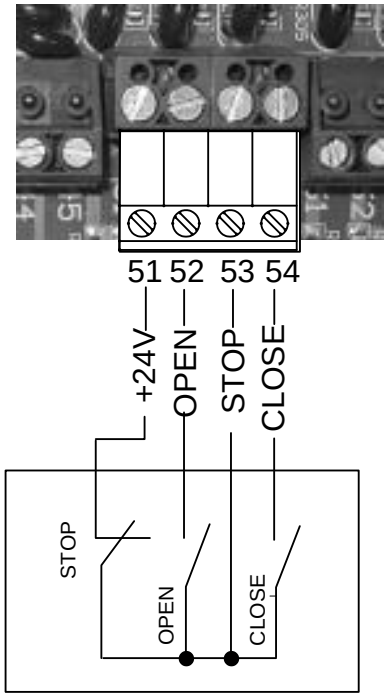


Fig. 15: External triggering devices

5.5 Traffic light connector

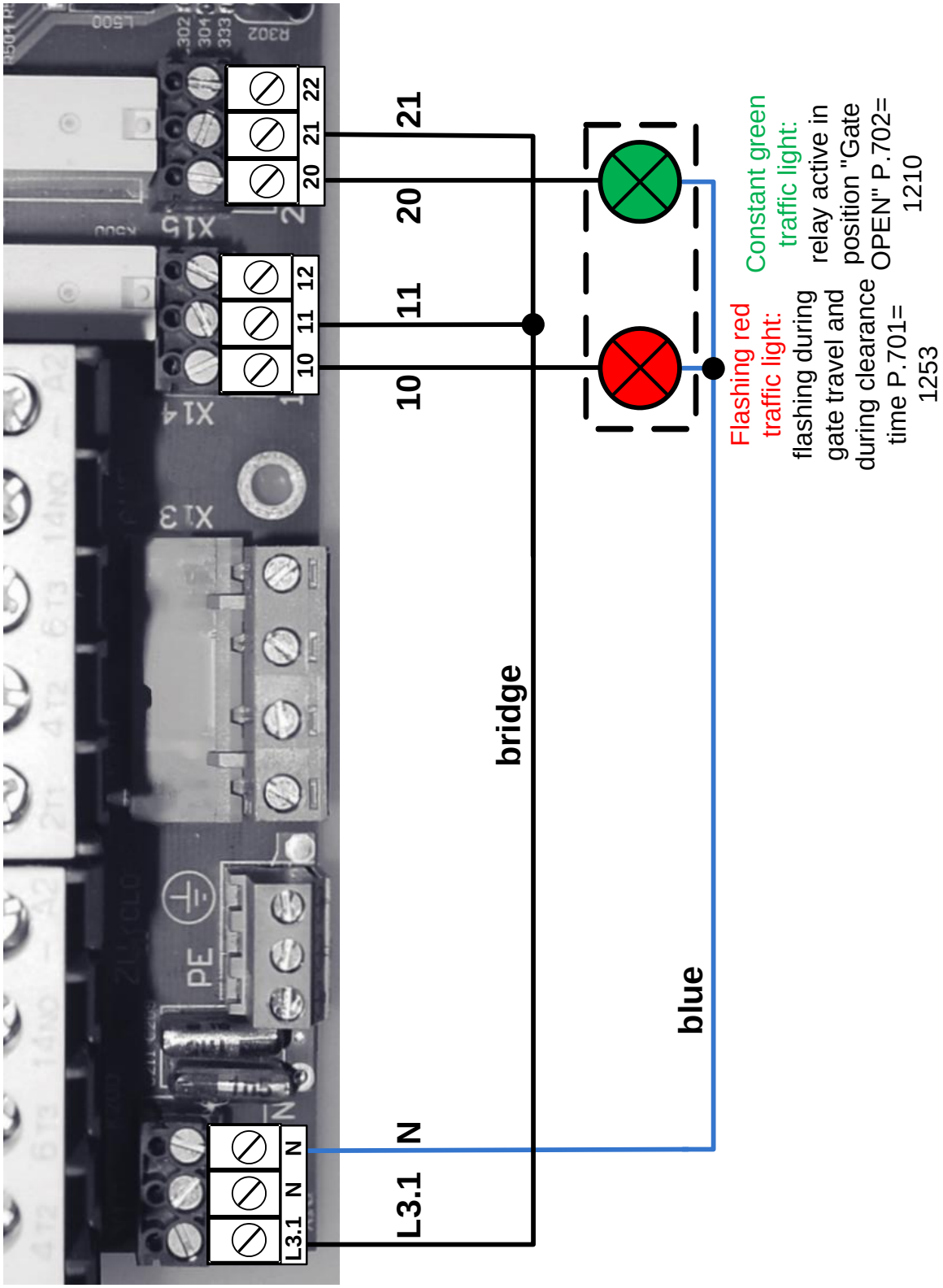


Fig. 16: photo eye connection

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

6 Overview outputs

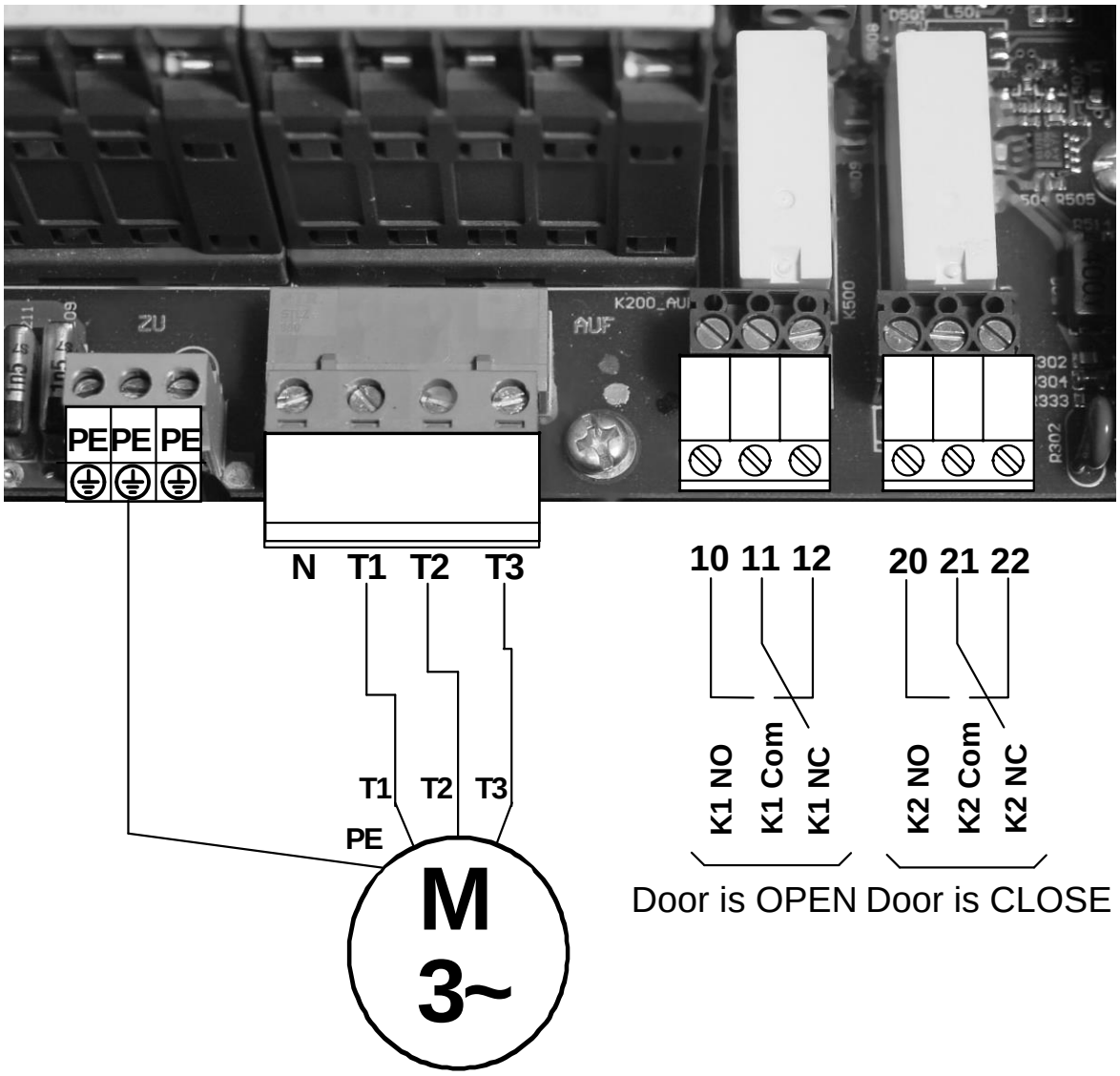


Fig. 17: Overview of the relay outputs

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

7 Overview of inputs

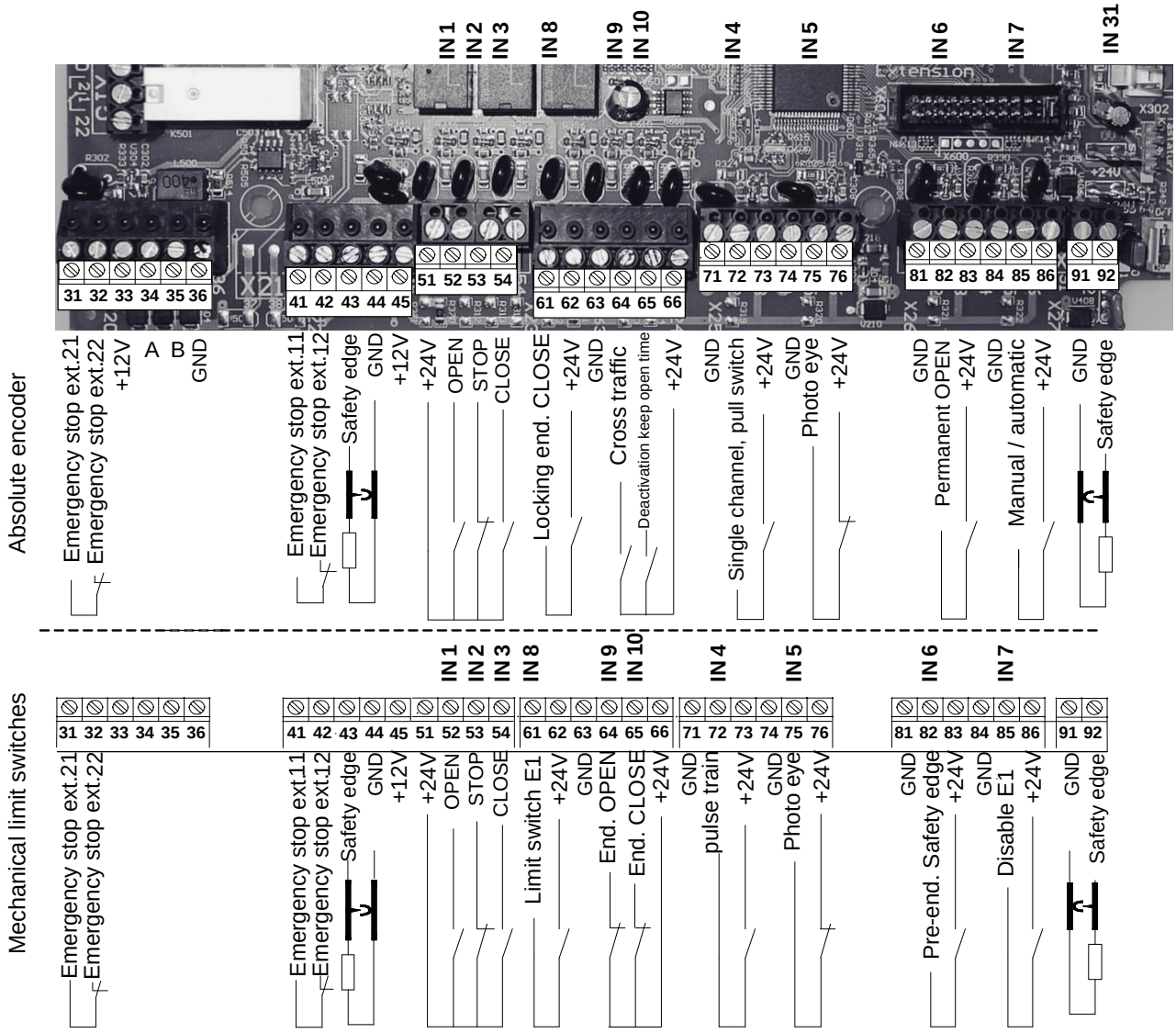


Fig. 18: Overview of inputs

8 General operating instructions to set parameters

8.1 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 Sxx (see illustration) to ON. The service mode is activated and you can close the cover.

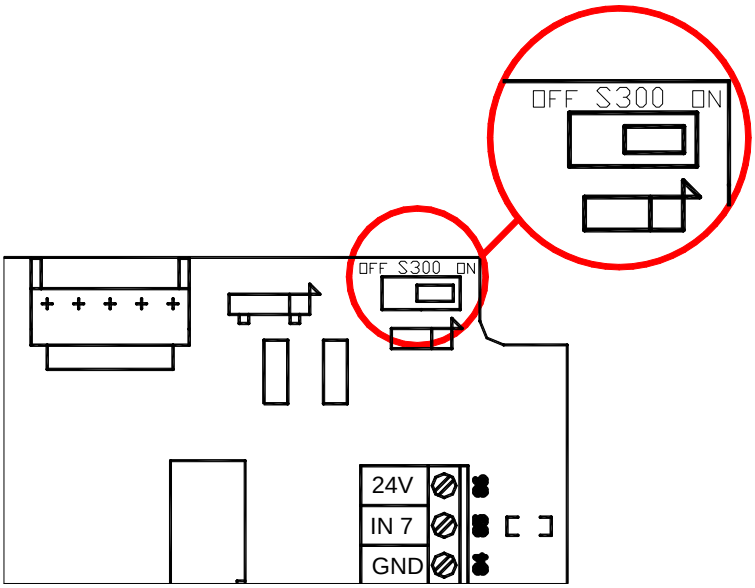
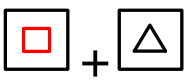


Fig. 19: DIP switch position

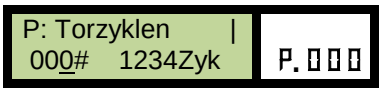
The service mode is automatically reset after approx. 1 hour. In order to reach service mode again, the controller must be turned off for a short period and then turned on again or a reset must be performed.

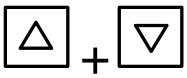
3. 

   Close the cover of the enclosure and turn on the controller.

4. 

   Keep these pressed simultaneously to reach the parameter selection. (the display will either show 1: plain text display or 2: 7-segment display).

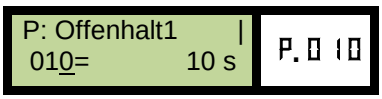


5. 

   Use the arrow keys to select the required parameter.

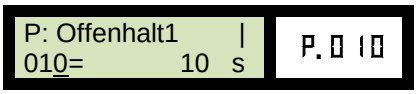
   ⚠ WARNING

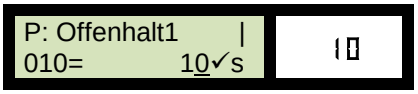
   Not all the parameters are visible or may be changed immediately; this always depends on the password and the type of position set.



8.2 Editing a selected parameter

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

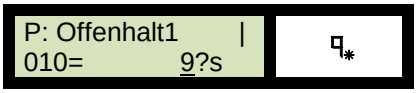




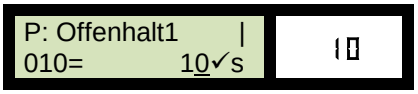
2. The parameter value is increased with the OPEN button and reduced with the CLOSE button.

or

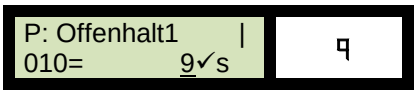
If the value has not yet been saved, a question mark is displayed after the number or the decimal point flashes.



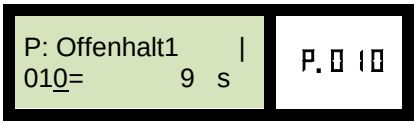
3. - If the STOP key is only pressed briefly, the set value is not saved and the value is changed to the originally stored value, i.e. the original value is displayed.



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



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



8.3 Exit from parameterization mode

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

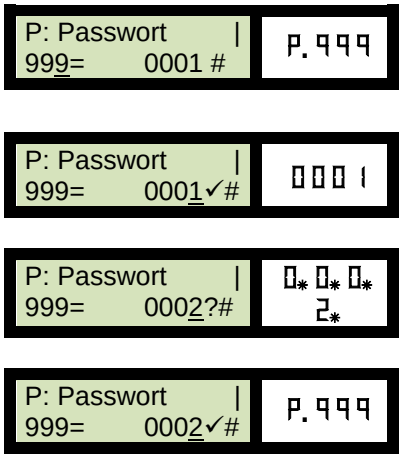
8.4 Execute a reset

+ + press simultaneously and keep pressed for approx. 3 seconds.

8.5 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:

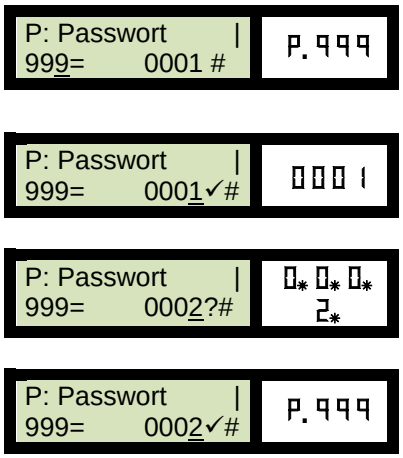
P.999 = 2 (extended commissioning mode)



8.6 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.999 = 2 (extended commissioning mode)



9 Basic settings

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

9.1 Automatic query of basic data

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

The DIP switch must have been turned on (see Fig. 19: DIP switch position) so that the controller can query parameters automatically.

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

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

The basic data does not require changes when they were previously retrieved and set automatically. See chapter 7 (General operating instructions to set parameters).

For the operation of the controller, see chapter: 7 “General operating instructions for the Parameterization”

- **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 (see Fig. 13: connecting cam switches)
  P.205: 1 = Mechanical limit switches Version 2 (limit switches and pre-limit switches are normally closed)
  P.205: 3 = Absolute encoder DES-A (GfA)
  P.205: 7 = Absolute encoder DES-B (Kostal)
  P.205: 8 = Absolute encoder TST PD

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 mode.

10 Start up……

Warning

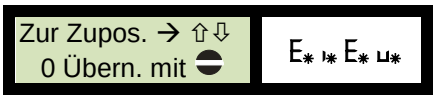
Before starting the controller, check the electrical connections and the correct installation of the plug-in cards.
After start up, the operation of all the safety devices must be checked

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

10.1 … with absolute encoder

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

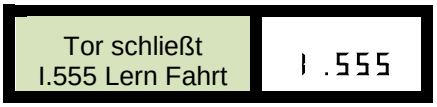
If the gate moves in the incorrect direction: incorrect motor rotary field, turn off controller and reverse the 2 motor connections.



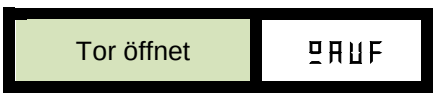
3. Move the gate to the OPEN position by means of membrane keypad △ and safe by pressing the □ STOP key for approx. 3 seconds.

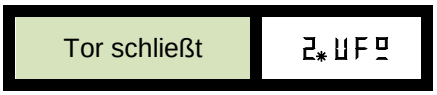
The pre-limit switches and ramps are automatically adjusted by the subsequent travel of the gate in automatic mode.

4. Press ▽ briefly, the gate moves down and is now taught in its position.



5. Now press △ repeat the process until the correction travel has completed.(Display I.510 = OK)





10.1.1 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

10.2 – with mechanical limit switches

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

2. Set lower limit switch so that it just trips

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

3. Press the OPEN-key △ to move the gate to a distance of 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.

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

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

5. If required by the door type: adjust upper and lower EMERGENCY limit switches.
   Connect the NC contacts, e.g. the safety circuit, in series with thermo pill.
6. Press STOP and OPEN to enter parameterization mode and select Parameter P.980 "Service Mode", open and set parameter value "2" to "0" (Automatic mode).
7. 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!

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

11 … with light curtain TST LGB

Activating the TST LGB application

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

1. Set application parameter A.480: to "1".
2. **Automatically Querying for Range:** Set the real light curtain distance per parameter P.44A in steps of 0.5 m.

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

Open door completely!
If the light curtain is occupied, the adjoining error message is displayed and the teach-in of all limit positions must be restarted.

Zur Aufpos. → Hindernis T75	E* 1*0*5*

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

! Synchron. ! I615 LL angef.	1*615 SYNC

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

Zur Aufpos. → I615 LL angef.	SYE*0*
Zur Aufpos. → Folie Stop	E*050* SYNC

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

5. Save by pressing the STOP-key for approx. 3 seconds.

To Open Pos. → 0 Übernahme mit	S*Y*E*0*

6. Press STOP-key.

Zur Aufpos. → Folie Stop	S*Y*E*0* E*050
Zur Aufpos. ok 0	S*Y*E*0*
LGx Qual. Test	S*Y*E*0*
! Synchron. ! 0 Start with	S*Y*E*u*

Light line alignment is being requested.

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

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

The detection zone of the light curtain must remain free otherwise the correction drive will be terminated and the synchronisation of the light curtain starts from the beginning.

Suche Si-Leiste xxx Auto_Zu	S*Y*C*L*

The display shows the messages:
Door was detected in CLOSE-position and the light beams where taught-in correctly.

!Korrekturfahrt! xxx Start mit △	I .515
!Korrekturfahrt! I615 LL Abgl. ok	I .610

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

8. Start correction drive by pressing the △ OPEN-key.

! Korrekturfahrt ! xxx Start mit △	I .515
Door opens. I.555 Calib. Run	I .555
Offenh= xxs I.515 Correc. Fahrt	I .515

Door opens and is taught-in into the position.

Display in end position OPEN.

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

Tor schließt I.515 Korr. Fahrt	I .515
Offenhalt = xxs I515 Korrekt. Fahrt	I .515
Offenh 1 = xxs I.510 Correc. OK	Γ .5
Offenh 1 = xxs Automatik	Γ .5
Door opens.	I .515 'AUF'

Display that correction was completed.

Door closes and remains in its CLOSE position.

Offenh 1 = xxs	Γ 10
Tor schließt	2✱UF'
FEIG ELECTRONIC xxx Zyklen	_EU_

The commissioning of the light curtain has been successfully completed.

Usually the lower limit position has to be corrected afterwards. This can be defined using the following parameters:

221: Correction value end position (lower limit position) door CLOSE -> This parameter has to be reset after each teach-in of all lower limit positions (P.210=5)!
P.275: Increment correction after synchronization is finished -> recommended as a fixed setting for the lower limit position. The value of this parameter MUST NOT be reset after each teach-in of all lower limit positions!

12 Functions

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

13 Overview of messages

Faults can be acknowledged provided they are not reset automatically.

⚠ACHTUNG The cause of the fault must be resolved first before the corresponding message is acknowledged.
Press the STOP button and keep it pressed, then press the EMERGENCY STOP button.
Alternatively, the STOP button can also be kept pressed for approx. 5 seconds.

Error No.	Description	Reason
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.010	Foil keypad short circuit	Foil key Open or CLOSE has a short circuit
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.021	Emergency opening wrong testing	• The max. allowed run time (P.490) during testing has exceeded • Call Service
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)

Error No.	Description	Reason
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.033	Bad position transmitter protocol	• Fault on the bus of the position transmitter • No position data available over an extended period
F.043	Pre-limit switch fault (light barrier)	• The pre-limit switch for the light barrier remains activated even in the middle end position or upper end position.
F.060	Breakaway recognized	• Breakaway was detected but not fixed • The automatic lead in after breakaway has failed
F.061	Belt breakage	An input configured as belt breakage sensor (P.50x = 0416) was activated. As long as the display flashes quickly, movements are not permitted -> acknowledgment required. Brief foil keyboard stop permits deadman moves. When the belt break was repaired mechanically and the input is no longer active an automatic acknowledgment is issued when the deadman closing movement reaches the closed.
F.080	Fault: Maintenance is required	• Service counter has expired
F.090	Controller not parameterized	• The min. necessary basic parameters for the controller have not yet been set → Activate DIP-switch and put in the asked parameters.
F.201	Internal E-Stop „push-button“ tripped or Watchdog (computer monitor only valid for FUS, FUN, FUE, FU3E, FU3P)	• 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 (only valid for FUS, FUN, FUE, FU3E, FU3P)
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.360	Short circuit detected on edge input	• Short circuit detected on edges with normally closed contact • The light beam of the optical edge is interrupted • Jumper for 1K2 / 8K2 is wrong set
F.361	Number of trips of the Safety input D, normally this is the integrated safety edge evaluation, has reached set limit	• Parameterized, maximum number of trips of the safety input D during a door cycle was exceeded → To reset close the door in deadman mode • Check the set number of trips in P.46E

Error No.	Description	Reason
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.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.36A	Redundancy error of the 8K2 slip door switch on the internal safety edge evaluation unit	• One of the contacts of the redundant 8k2-wicket door switch is defective • The slip door was not fully opened or closed
F.371	Number of trips of the Safety input E, normally this is the integrated safety edge evaluation, has reached set limit	• Parameterized, maximum number of trips of the safety input E during a door cycle was exceeded → To reset close the door in deadman mode • Check the set number of trips in P.47E
F.372	Redundancy error with short circuit	• 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.379	Safety edge detection defective (coding pin or parameter setting)	• No module plugged in but was reported as present by a parameter • The controller was started up with another module than the one currently plugged in
F.37A	Redundancy error of the 8K2 slip door switch on the internal safety edge evaluation unit channel 1	• One of the contacts of the redundant 8k2-wicket door switch is defective • The slip door was not fully opened or closed

Error No.	Description	Reason
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.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.401	Watchdog Error	• Internal Watchdog has released
F.40A	Software Exception	• Internal Error • Communication with TST RFUxK board fault
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
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

Error No.	Description	Reason
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.515	Motor protection function detected overcurrent	• Incorrect motor curve (motor rated current) set (P.101) • Too much boost (P.140 or P.145) • Motor incorrectly dimensioned
F.519	IGBT driver chip detected overcurrent	• 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 too high • Motor feeds back too much energy in generator mode, door motion energy cannot be sufficiently brought down.
F.521	Low voltage in DC-bus	• Input voltage supply too low, usually at load • Load too great / final stage or brake chopper fault
F.522	Permissible DC current for a single-phase power supply is too high	On the FU3F a single-phase power supply was detected and the permissible DC current for a single-phase power supply is too high. This error always occurs in combination with F.540
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 extremely
F.530	Heat sink temperature outside of working range Limit 2	• 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

Error No.	Description	Reason
F.601	Bad Light curtain reception quality	Poor reception quality when the light curtain is started • Light curtain dirty • Protection foil not removed • bad aligned • wrong Range set.
F.610	Light curtain light line alignment	Light line alignment has not been done. • Too less Increments
F.611	Light curtain light line position values not plausible	Position values stored by the light curtain do not match door movement • Objects in the door area during teach in
F.612	External RS-485	RS-485 communication failure between Receiver and Door Controller • Insufficient valid position data • A and B wires twisted • wrong connection.
F.613	Internal RS-485	RS-485 communication error between Transmitter and Receiver • A and B wires twisted • wrong connection

Error No.	Description	Reason
F.615	Internal error Light curtain transmitter	Internal transmitter error • RAM test fail • ROM test fail • Program run error • Sync error • Addressing module defective • Dark test fail • D/A converter defective • • Replace hardware!
F.616	Internal error Light curtain Receiver	Internal receiver error RAM test fail • ROM test fail • Program run error • Sync error • Addressing module defective • Dark test fail • D/A converter defective • Watchdog not triggered or hangs • Replace hardware!
F.617	Light curtain incompatibility	Transmitter and receiver are not compatible. • modified Transmitter serial number • incompatible Hardware version / revision level • incompatible Software version
F.621	Light curtain test error (transmitter)	test error for the internal transmitter system test
F.622	Light curtain test error (receiver)	test error for the internal receiver system test
F.626	Light curtain test error (Out 1)	Test / wiring error of output 1
F.627	Light curtain test error (Out 2)	Test / wiring error of output 2
F.628	Light curtain LGB dark test error	Dark test error • external light source • uncontrolled transmissions • defective receiver

Error No.	Description	Reason
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.752	Timeout with protocol transmission	• Interface cable defective / interrupted • Supply voltage 12 V fault, e.g. short circuit in spiral cable • Channel A and B connected over cross • Absolute encoder processor electronics defective • Defective hardware or electrically noisy environment • Take a controllable 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.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 too high for the parameter set Encoder resolution	• The Value of the Parameter P.202 (set Encoder resolution) is too 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
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

Error No.	Description	Reason
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.Fx, 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.Fx, 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.Fx, 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

Error No.	Description	Reason
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
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 edge is faulty
F.843	Frequency error on input 3 of mobile unit	• The connected optical safety edge is faulty
F.851	Max. Number of allowed Reversing, because of bad WiCAB radio, exceeded.	The radio connection interrupts during door drive for a short time
F.852	Communication error between TST FSx and controller	This error is shown when the controller don`t have RS485 communication for min. 1 second with the stationary unit of TST FSx. Possible causes are: • The stationary unit is broken • The stationary unit is not or wrong connected
F.853	TST PE_FSBS operating voltage too low	The operating voltage of encoder TST PE_FSBS is too low (less than 8V). As a result, the calculation of the position must be terminated.
F.856	Communication error between mobile and stationary unit	This error is shown when the stationary unit don`t have communication for min. 1 second with the mobile unit of TST FSx. Possible causes are: • No mobile unit in radio range • The battery of the mobile unit is empty or not connected • The antenna of the stationary unit is not connected or missing • Mobile unit or stationary unit is defective

Error No.	Description	Reason
F.857	Battery empty	• The battery voltage is under the limit set with Parameter P.F0B • The battery voltage of the mobile unit is to low • Use new battery and set back battery capacity to 100% by pressing the stop key for long time in P.F09. • To deactivate this error message you can set P.F09 and P.F0B to 0
F.859	Software version	The software versions of the stationary and the mobile unit are not compatible. No safe trip possible.
F.860	Internal fault stationary unit	Internal system fault on the stationary unit.
F.861	Internal fault mobile unit	Internal system fault on the mobile unit.
F.862	Internal positioning system error	Internal error of the positioning system. Presumably, the magnet is not attached properly.
F.867	Address of mobile unit not set	• The address of the mobile unit was not set so far • The address has to be set in Parameter P.F07 • The address is written on a sticker on the mobile unit
F.912	RAM error	• Defective hardware or noise-saturated environment
F.920	Internal 2.5 V reference voltage incorrect	• Hardware defect
F.921	Internal 15 V voltage incorrect	• Hardware defect
F.922	Static and dynamic monitoring of the e-stop chain against defect or external power supply (Static monitoring exists at every control dynamic monitoring is does not exist at WU2 / WUI2 / FUH / FU3R / FUZ (p) / FUZ2 (p)	Static monitoring: Broken emergency e-stop chain means: All emergency exits from the interrupted including all further following exits must be triggered, is further exit not triggered an external power supply is the reason. Dynamic Monitoring: During the system testing is actively opened via an internal switch closed emergency stop chain, so all emergency exits must be active, if this happens a foreign power supply or a defect is the reason.
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.929	Faulty K-stop relay	• The testing of the stop relay was not successful • Controller defective
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

Error No.	Description	Reason
F.933	Wrong frequency of CPU	• The clock frequency of the processor is wrong
F.935	Stack error	• User Stack or System Stack overflowed • Possible software error due to recursive invocations (e.g. profile)
F.941	ROM Error des IO Processors	• ROM Error of IO Processors
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
F.965	Faulty door cycle counter with active emergency opening	• The door cycle counter does not count or is faulty. Because of this no emergency opening testing can be done.
F.970	Plausibility Param.block error	• New EPROM version • Controller not yet initialized • Some parameter is implausible

14 Information messages

No.	Description
I.043	• During teaching there was passing traffic that triggered the photo eye. • The photo eye position tolerance set in P.4xA was exceeded or dropped below in two successive cases.
I.080	Service counter will run off
I.160	Permanent open command still active
I.161	Priority still active
I.170	Forced opening active
I.180	Wait for foil key command
I.185	Wait for reset by stop foil key

I.199	Door counter wrong
I.205	Synchronization performed
I.210	Limit switch not plausible
I.211	Limit switch not plausible
I.310	Open command to door 2
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	Preset speed for open or close drive not reached • Pre limit switch reached before full speed was reached --> adjust ramps • Current limiter prevents the driving in full speed --> Inverter or motor are working on their limits --> adjust ramps or limiter
I.610	Light curtain light line alignment OK
I.615	Light line alignment requested.
I.616	Second light line alignment The second light line alignment with normal drive speed is active
I.621	Light curtain position encoder resolution too low The resolution of the installed position encoder is too low to maintain robust light curtain operation. More increments are required per door move. (Message only occurs when DIP-Switch is ON.)
I.856	The internal safety edge is tripped because of an WiCab radio problem The radio connection of the WiCab system is gone for a short moment during door drive. Possible reasons for this are: • The Distance between mobile and stationary unit is larger than specified • No perfect Orientation of stationary and mobile antenna • The radio link is disturbed by external noise

15 General messages

General messages	
STOP	Stop / Reset state, wait for next incoming command
_Ec_	lower limit position
≡Ec≡	lower limit position locked à raising not possible (e.g., lock-door)
CLO ⌑	closing active
¯Eo¯	upper limit position
≡Eo≡	upper limit position locked à closing not possible (e.g., safety edge)
⌑OPE	opening active
-E1-	middle limit position E1 (intermediate stop position)
≡E1≡	middle limit position locked à closing not possible (e.g., safety edge)
FAIL	fault à only deadman travel is possible, automatic opening may also be possible
CALI	calibration à setting the limit positions in deadman travel mode (for absolute encoder) à Start procedure using STOP key
≡ES≡	E-stop à Travel not possible, hardware safety chain interrupted
HdSA	E-travel à Deadman travel without regard for safety facilities, etc...
'Hd'	manual à Deadman mode
ParA	parameterization
'Au'	automatic→ à indicates change from "Manual" to "Automatic" status"
'Hc'	semi-automatic → à indicates change from "Manual" to "Semi-automatic"
WU2	first display after switching on (Power Up and Self-test)
LOCK	**Locked** -> Display after the end of the set time for the virtual key switch
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 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 possible
Hd.Eo	Upper limit position reached, no further deadman opening possible
Hd.Ao	Outside of permitted Eo position (no deadman opening possible)
Information messages during the parameter configuration:	
noEr	Error memory: no error saved
Er--	Error memory: if error but without associated message being found
Prog	Programming message while carrying out original parameter or default set.

General inputs	
E.000	Open key on membrane keypad
E.050	STOP key on membrane keypad
E.090	STOP 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
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 1
E.363	internal safety edge 1 faulty
E.380	activation of internal safety edge 2
E.383	internal safety edge 2 faulty
Wireless plug-in module	
E.401	Wireless Channel 1
E.402	Wireless Channel 2
Plug-in module for inductive loop detection	
E.501	Detector channel 1
E.502	Detector channel 2

16 Specifications

Housing dimensions (W x H x D):	Housing dimensions (W x H x D): ca.: 182 x 320 x 93mm (without mushroom button)		
Installation:	Vertical using wall bracket on housing bottom		
Power supply range for 3-phase current with N	: 3 x 200 ... 415V ± 10% / 50 .. 60Hz corresponds to a power supply voltage of 115 ... 240V ±10% / 50 .. 60Hz		
Power supply range for 3-phase current without N:	3 x 115 ... 240V ± 10% / 50 .. 60Hz corresponds to a power supply voltage of 115 ... 240V ± 10% / 50 .. 60Hz IMPORTANT N must be connected to L2.		
Power supply range for 3-phase current without N in combination with the option TST WU-0.0-A – Supply adjustment 400V:	3 x 360 ... 400 V ±10 % / 50 .. 60 Hz		
Required fuses:	3x 10A Type K		
Power consumption power supply unit without motor:	**max. 30 W**		
Power consumption power supply unit with AC3 motor at:	**400 V**	**230 V**	**115 V**
	max. 2,2 kW	**max. 1,5 kW**	**max. 0,75 kW**
External power supply (depending on supply):	phase L1 via fuse F200 (2 AT) on terminal L3.1		
Control voltage / external power supply 2:	24 VDC ±5% max. 500 mA including all plug-in modules and 12 V connections fused via self-resetting semiconductor fuse		
Control voltage / external supply 3:	For electronic limit switches and safety edge Nominal value 11.3V / max. 150mA		
Control inputs 1IN 10:	24 VDC / typ.15 mA min. signal duration for input control commands: > 100 ms all inputs must have potential-free connections or: < 2 V: inactive à logical 0 > 17 V: active à logical 1		
Serial interface RS485 A and B:	only for electronic limit switches RS485 level, terminated in 100Ω		
Safety chain / emergency stop:	all inputs must have potential-free connections < 15 V: inactive a logical 0 >17 V: active a logical 1 Contact load capacity: ≥ 35 VDC / ≥ 200 mA When the safety chain is interrupted no movement of the drive is possible, not even in deadman mode		
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)**		
Relays K1, K2:	⇒ 24VDC / 500 mA ⇒ 230 VAC / min. 0.1 A / max. 80 W potential-free switching, change-over contact	***Contacts which have been used once for power switching can no longer switch extra-low voltage***	
Drive output:	3x 400VAC, max. 2.2 kW for AC-3 Reversing contactor is prepared for operating three-phase drives Max. length of the motor cable: 30m		
electromechanical brake	230 VAC-control via switched motor phase and N		
Operating temperature range:	-20...+50°C;		

Storage temperature range	-20...+70°C
Relative humidity:	up to 95% non-condensing
Connection type of the power line:	Y, power cables must only be replaced by the manufacturer, authorized service agents or qualified persons
Equipment mobility:	stationary
Protection class:	Protection class I
Equipment type:	motor appliance, external motor is not part of the delivery from FEIG ELECTRONIC GMBH
Noise Emission:	< 30 dB (A)
Vibration	low-vibration installation, e.g. on a concrete wall
Protection class	IP54 (IP65 by replacing CEE connection and sealing cable entries) All unused cable entries must be closed.
Weight	approx. 2.8 kg
Type tested to:	**Standards:**
Machinery Directive:	a 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 photo eye 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 62061:2005 Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems (IEC 62061:2005) Safety Integrity Level (SIL): 1
Low-Voltage Directive: 2014/35/EU	DIN EN 60335-1:2012 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 61000-6-3:2011 Electromagnetic radiation, living area EN 61000-6-4:2011 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

17 EC Declaration of Conformity

FEIG ELECTRONIC

FEIG ELECTRONIC GmbH
Lange Straße 4
D- 35781 Weilburg

EG-Konformitätserklärung

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

Hiermit erklären wir, dass die nachstehende Maschine

Bezeichnung	**Torsteuerung**
Typ/Handelsbezeichnung	**TST WU-2, TST WUI-2, TST WUE-2, TST WUIE-2**

den einschlägigen Bestimmungen folgender Richtlinie entspricht:

Maschinenrichtlinie	2006/42/EG
EMV-Richtlinie	2014/30/EU
Niederspannungsrichtlinie	2014/95/EU
ROHS2	2011/65/EU

Angewandte harmonisierte Normen:

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

Angewandte nationale technische Spezifikationen:

EN 12453:2000 Abschn. 5.2	Nutzungssicherheit kraftbetätigter Tore – Anforderungen Kapitel 5.2 Antriebssysteme und Energieversorgung (Nur TST WU-2 / TST WUI-2)
EN 12453:2017 Abschn. 5.2	Nutzungssicherheit kraftbetätigter Tore – Anforderungen Kapitel 5.2 Antriebssysteme und Energieversorgung (Nur TST WUE-2 / TST WUIE-2)

Bevollmächtigter für die Zusammenstellung der relevanten technischen Unterlagen:

Weilburg, 28.01.2020

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

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

TÜV NORD CERT GmbH Essen,
Zertifizierungsstelle Maschinen / Certification Body Machinery
Langemarckstraße 20, D-45141 Essen, Notified Body ID. No.: 0044
Reg.-No.: 44 780 13132621

Diese Prüfstelle ist zuständig im Sinne von Anhang XI der EG-Maschinenrichtlinie!
Die technische Dokumentation ist am Firmenstandort Weilburg archiviert.

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

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

Fig. 20: EC Declaration of Conformity