Connection and installation manual

Swing gate control unit ST 51

tsi Green safe

tousek® GATE AUTOMATION

Content

General warning and safety notes

- These installation and operating instructions form an integral part of the product **"control unit".** They have been specifically written for professional installers trained and skilled in the trade and should be carefully read in their full length before carrying out the installation. It concerns the control only, not of the overall device "automatic gate". After the installation this manual has to be handed over to the user.
- **Installation, connection, adjustments, putting into operation, and servicing may only be carried out by trained professionals in full accordance with these installation and operating instructions.**
- **Before carrying out works on the gate system, the power supply has to be turned off.**
- Before taking off the housing cover, always turn off the mains switch!
- The EU Machine Directive, laws and rules concerning the prevention of accidents, and laws and standards which are in force in the EU and in the individual countries have to be strictly followed.
- The TOUSEK Ges.m.b.H. can not be held liable for any claims resulting from disregards of the laws and standards in force during the installation and operation.
- The packaging materials (cardboard, plastic, EPS foam parts and filling material etc.) have to be properly disposed of in accordance with the applying recycling and environmental protection laws. They may be hazardous to children and therefore have to be stored out of children´s reach.
- The product is not suitable for installation in explosion-hazardous areas.
- The product may only be used in accordance with its original purpose, for which it has been exclusively designed, and which is described in these installation and operating instructions. The TOUSEK Ges.m.b.H. rejects any liability if the product is used in any way not fully conforming to its original purpose as stated herein.
- **Children have to be instructed** that the gate facility as well as the belonging parts may not be used improperly, e.g. for playing. Furthermore handheld transmitters have to be kept in safe places and other impulse emitters as buttons and switches have to be installed out of children's reach..
- Before beginning with the installation the installer has to make sure that all mechanical components of the gate facility, like carrier profile/rail, gate frame and panels, guiding elements etc. are sufficiently supportive and resistant for the purpose of gate automation.
- All electrical installations have to be made in full conformity with the applying rules and laws (e.g. using a fault current circuit breaker, proper grounding etc.).
- **An all-pole disconnecting main switch with a contact opening-gap of minimum 3 mm has to be foreseen.**
- **After installation the proper function of the gate facility and the safety devices has to be checked!**
- The TOUSEK Ges.m.b.H. rejects any liability for claims resulting from usage of the product in combination with components or devices which do not fully conform to the applying safety laws and rules.
- Only original spare and replacement parts may be used for repair of the product.
- The installer has to inform the user about all aspects of the automatic operation of the complete gate facility, as well as about emergency operation. The installer further has to supply to the user all instructions relating to the safe operation of the gate facility. The installation and operating instructions also have to be handed over to the user.

Maintenance

- **Maintenance works may only be carried out by qualified personnel.**
- **Maintenance and servicing of the complete gate facility has to be carried out according to the gate builder´s/ installer´s instructions.**
- **Check the proper sensitivity setting of the ARS safety reverse system once a month.**

EU - Manufacturer´s Declaration:

The company TOUSEK Ges.m.b.H., based in Zetschegasse 1, A-1230 Vienna/Austria, hereby declares that the control unit ST 51 complies with the folloleaf directives:

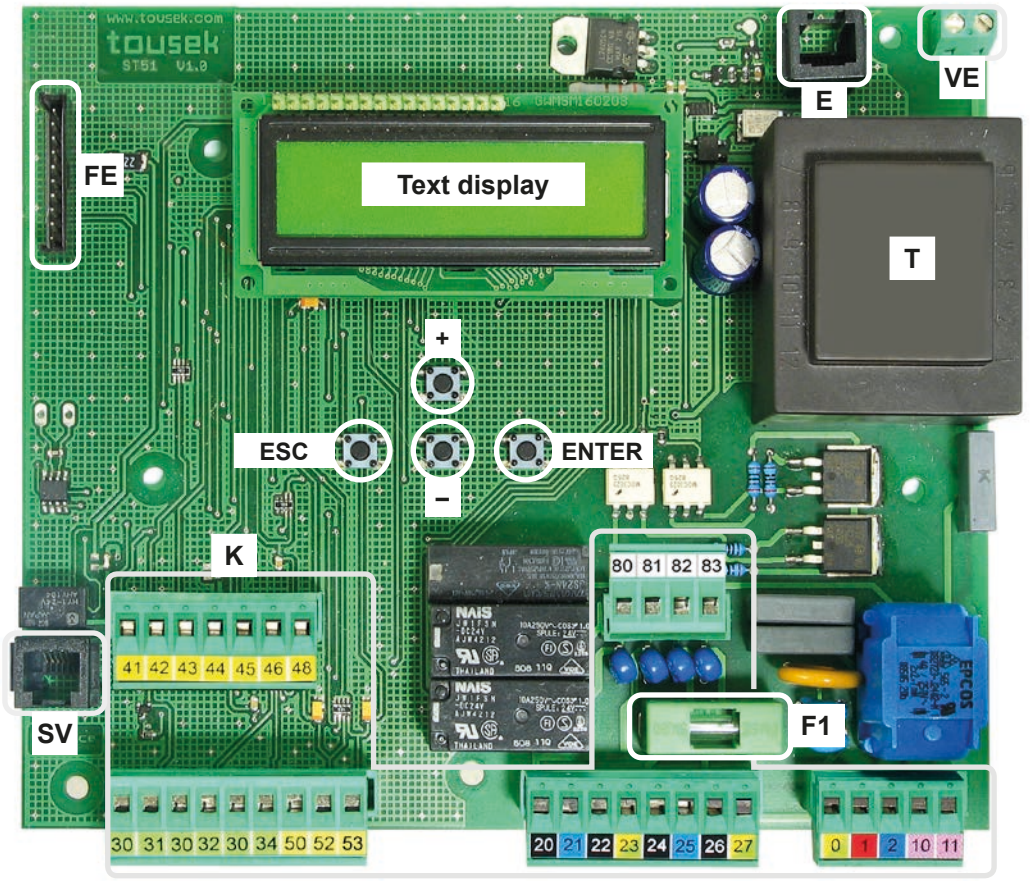
- Low Voltage Directive 2014/35/EU, incl. changes
- Electromagnetic Compatibility Directive 2014/30/EU, incl. changes

January 2019

Control board features

- suitable for swing gates with electromechanical operators 230V (1 or 2 gate leafs)
- leaf delay adjustable at opening and closing
- automatic closure with adjustable pause time.
- Additional function for permanent open
- separately adjustable operating time of both operators
- separately adjustable softstop time of both operators.
- Separate force adjustment for opening and closing movement
- Operating mode: impulse-, automatic- or deadman mode
- Integrated evaluation of safety sensing edges
- self-monitoring of photocells
- self-diagnosis
- optional module: “electric lock /magnetic clamp” or “drop bolt”
- slot for optional radio receiver
- easy programming thanks to text display

Control board overview



Attention

During connection, adjustment and maintenance works please take care, that the electronic circuit board won´t be damaged by moisture (rain).

Important

The optional „tousek-connect“ or the „tousek-service interface“ must be connected with socket **(SV)**! **Not with (E) !**

Components of the control board

(K) terminal blocks
(E) System connector for optional module motor lock or electric lock / magnet (➔ *page 18–20)*
(VE) 230V a.c. for electric lock/magnet module
(SV) service connector (e.g. for software update) or TC-, TSI-connection (optional „tousek-connect“/ „tousek service Interface“)
(FE) slot for optional radio receiver (➔ *page 21)*
(T) transformer
(F1) fuse 6,3A F

Text display and programming keys +, -, ESC and ENTER

Technical data

Swing gate control unit ST 51			
power supply	230V a.c., +/-10% 50Hz	magnet output (optional)	24Vd.c.
motor output	2 x 500W, 230V a.c.	ambient temperature	- 20°C + 70°C
flashing light output	230V AC, 40W	protection class	IP54
electric lock output	12Vd.c. oder 24V d.c.	Art.no.	12111660
photocell output	24V a.c., max. 0,3A		
optional components	pluggable radio receiver • motor lock module or E-lock/magnet module • radio transmission system TX 310		

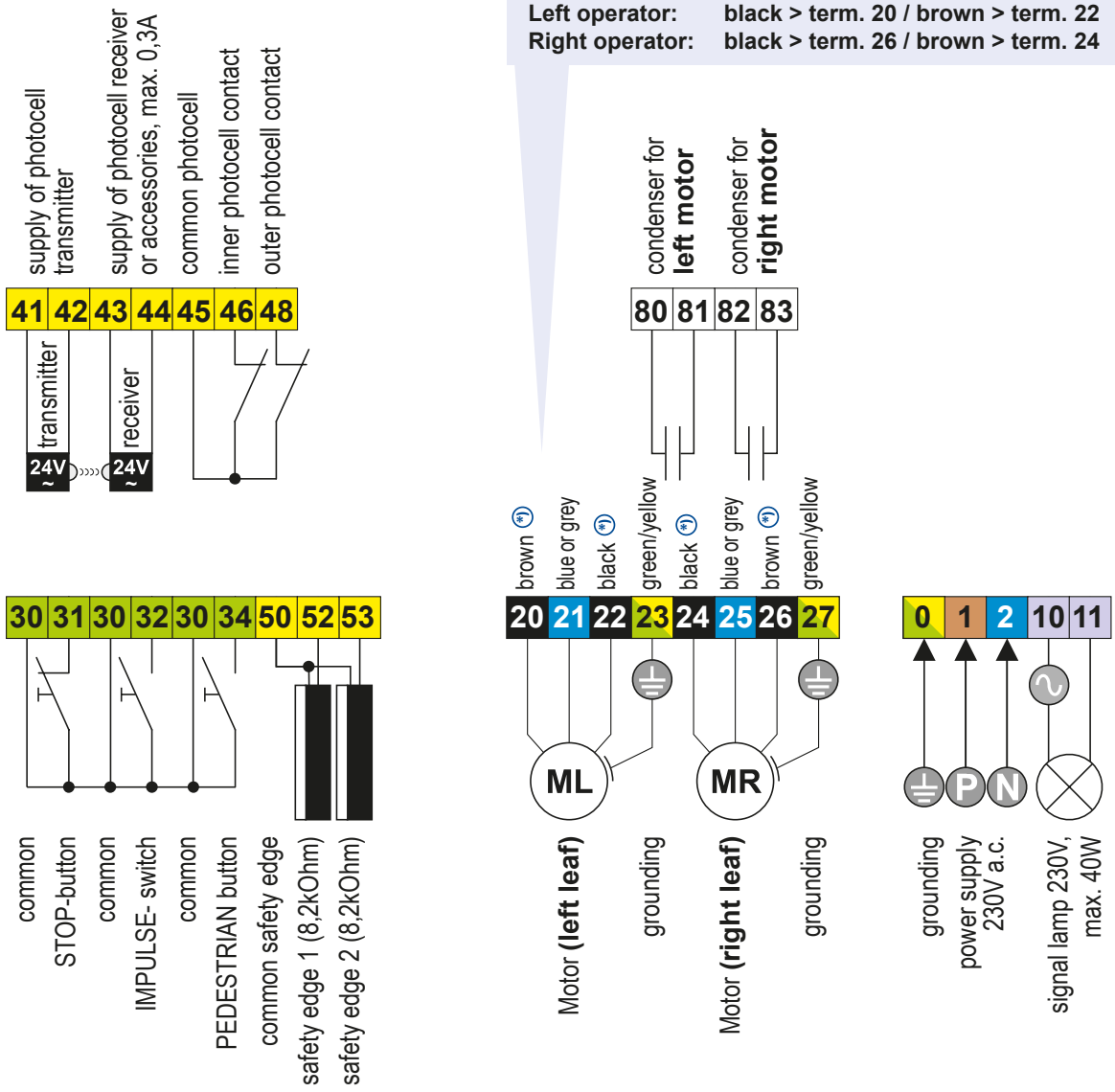
Warning

- Before taking off the control cover, the mains switch must be turned off !
- The inside of the control unit is under tension when power supplied.
- In order to avoid electrical strokes, the safety regulations have to be respected.
- The device may only be connected by qualified personnel (specialised staff).
- The product is not suitable for installation in explosion-hazardous/explosive areas.
- An all-pole disconnecting mains switch with a contact opening gap of min. 3 mm has to be foreseen. The gate facility has to be secured according to the valid safety regulations!
- IMPORTANT: The control lines (sensor, buttons, radio, photocells, etc.) have to be laid separately from the 230V lines (supply line, motors, signal lamp).

Important (TURN 310UF, SPIN)

The operators TURN 310UF and SPIN differ from the wiring diagram:

Left operator: black > term. 20 / brown > term. 22
Right operator: black > term. 26 / brown > term. 24

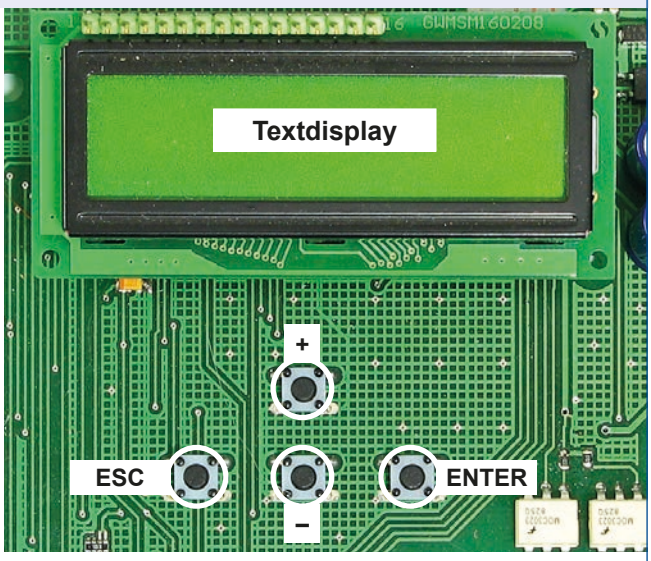


The stop input has no emergency stop function! - In order to ensure the emergency stop function, provide the supply line with an all-pole disconnecting emergency stop switch, that locks after actuation!

Programming buttons

- The adjustment (programming) of the operating parameters is carried out via four programming buttons and the text display.
- Before you can start programming, select the language of the display. You can do this by pressing the **+ or -** and choose the language for the menuas and press **ENTER.**
- Note: The language setting can be changed any time by pressing the **ESC button for 5s**.

- The text display informs you on the operating modes, selected menus and adjustment of several parameters.
- The programming of the control is done through four buttons **(+, -, ENTER and ESC).**
- Scrolling through the different menu points (up/ down) and changing a parameter (increase/ decrease) is done with **buttons + and - .** ***AUTO-COUNT:*** When a button is pressed and held, an automatic scrolling of the menu (or change of the parameter) is carried out.
- By pressing the **ENTER-button** you enter the displayed menu point or memorise the shown value of a parameter.
- By pressing the **ESC-button** you return to the superior menu point. Changed adjustments of a parameter are rejected with this button (the original value is kept).



- ***AUTO-EXIT:*** If during programming no button is actuated for 1 minute or longer, the programming mode is left automatically. The control is set „ready“ **without storage** of possibly changed values.

Programming menu

- The programming menu is divided into „BASIC SETTINGS“ and the „MENU CONTROL“

BASIC SETTINGS

- When programming the control the **first time,** you enter the **„BASIC SETTINGS“.**
- Here the necessary adjustments for operation of the gate facility are made.
- Entering the menu control (for extended programming) is possible by selecting **„MENU CONTROL“**.

MAIN MENU CONTROL

- The next time you will directly enter **„MENU CONTROL“.** (The BASIC SETTINGS are skipped.)
- The menu control contains all possible adjustments.

In the following the single menu points are marked as shown below:

○ = possible adjustment (or value assignment) ⊙ = factory setting ➲ = status display

[G] marks the menu points which are contained in the BASIC SETTINGS.

Main layer		Sub layer	Adjustments	
buttons/switches → page 8	G	impulse button	⊙ OPEN/STOP/CLOSE ○ OPEN/CLOSE/OPEN ○ OPEN ○ DEAD MAN	***) if impulse button is set to DEADMAN, then the pedestrian and close button are also set automatically to DEADMAN mode. (not selectable under „pedest.- button“)**
		pedestrian button	⊙ OPEN/STOP/CLOSE ○ OPEN/CLOSE/OPEN ○ OPEN ○ DEAD MAN *)	
safety → page 10	G	inner photocell	⊙ active ○ not active	
	G	outer photocell	⊙ active ○ not active	
	G	main safety edge 1	⊙ active ○ not active ○ radio edge TX310	
	G	main safety edge 2	⊙ active ○ not active ○ radio edge TX310	
		photocell function inside	⊙ during closing reverse ○ stop - after release open ○ during opening stop - then open	
		photocell function outside	⊙ during closing reverse ○ stop - after release open	
		PHC-pause time	⊙ no influence of photocell ○ abort pause time ○ re-start pause time ○ immediate close after opening	
		PHC-self test	⊙ active ○ not active	
left leaf → page 15	G	left motor	⊙ motor ON ○ motor OFF	No left operator: > Motor OFF !
	G	delay left leaf	⊙ opening delay ○ closing delay	
	G	delay time left	○ 0...25s	⊙ = 2s
		runtime OPEN	○ 3...90s	⊙ = 20s
		runtime CLOSE	○ 3...90s	⊙ = 20s
		max. force OPEN	○ 30...100%	⊙ = 70%
		max. force CLOSE	○ 30...100%	⊙ = 70%
		soft stop time	○ 0...25s	⊙ = 5s
right leaf → page 15	G	right motor	⊙ motor ON ○ motor OFF	No right operator: > Motor OFF !
	G	delay right leaf	○ opening delay ⊙ closing delay	
	G	delay time right	○ 0...25s	⊙ = 2s
		runtime OPEN	○ 3...90s	⊙ = 20s
		runtime CLOSE	○ 3...90s	⊙ = 20s
		max. force OPEN	○ 30...100%	⊙ = 70%
		max. force CLOSE	○ 30...100%	⊙ = 70%
		soft stop time	○ 0...25s	⊙ = 5s
operating mode → page 16		impulse button	⊙ stop, start of pause time ○ impulse suppression when opening ○ pause time extension	
	G	operating mode	⊙ impulse mode ○ automatic 5...255s	
		partial opening	○ 25...100%	⊙ = 100%
		runtime correction	○ open +10...turned off...closing +10	⊙ = OFF
		automatic mode	⊙ complete/partial opening ○ only complete opening ○ only partial opening	
		pause time logic	⊙ no influence ○ permanent open in automatic mode	
		increase pressure	⊙ OFF ○ 0,1...3s	
		closing edges	⊙ left/right ○ inside/outside	
lights/lamps → page 17		prewarning OPEN	○ OFF, 1...30s	⊙ = OFF
		prewarning CLOSE	○ OFF, 1...30s	⊙ = OFF
peripherals → page 18		electric lock	⊙ switched off ○ 1...10s	
		reverse stroke reverse stroke only with active locking!	⊙ switched off ○ 0,5...8s	
		locking	⊙ e-lock/magnetic clamp ○ motor lock	
		drop bolt	⊙ OPEN and CLOSE ○ only OPEN ○ only CLOSE	visible only if activated under „locking“
		drop bolt opening delay	○ 1...5s	⊙ = 3s
diagnosis → page 20		status display	➲ status display	
		factory setting	⊙ NO ○ YES	
		Software version	➲ shows software version	
		serial number	➲ shows serial number	
		protocol	➲ shows protocol events	

Note: some adjustments regarding function or operating logic can only be executed if gate is closed and if the display shows „ready“.

tousek DIGITAL

ESC ENTER

Warning

- **Before taking off the control cover, the main switch must be turned off!**
- **If the control is power supplied, its inner part is under tension.**
- **In order to avoid electrical strokes, the safety regulations have to be kept.**
- **The device may only be connected by trained professionals.**
- **The product is not suitable for installation in explosion-hazardous areas.**
- **An all-pole disconnecting main switch with a contact opening gap of min. 3 mm has to be foreseen. The gate facility has to be secured according to the valid safety regulations!**
- **IMPORTANT: The control lines (sensor, buttons, radio, photocells, etc.) have to be laid separately from the 230V lines (supply line, motors, signal lamp).**

The single menu points are marked as shown below:

○ = possible adjustment (or value assignment) ⊙ = factory setting ➲ = status display

G marks the menu points which are contained in the BASIC SETTINGS.

- A general status display of all inputs is available in menu DIAGNOSIS/STATUS DISPLAY.

Buttons/switches

G Impulse button (terminals 30/32)

⊙ **OPEN/STOP/CLOSE successive impulses (factory setting):** an impulse of the impulse switch makes the motor start opening/closing. If the impulse switch is actuated again during this opening-/closing movement, the motor stops. With the next command of the impulse switch the motor moves in the opposite direction of the last gate movement

○ **OPEN/CLOSE/OPEN successive impulses:** an impulse of the impulse switch makes the motor start opening/closing. If the impulse switch is actuated again during this opening/closing movement, the travel direction is reversed.

- **In this operation mode it is not possible to stop the motor with the impulse switch – it always moves until reaching an end position. (Opened or closed position).**
- **for the function OPEN/CLOSE/OPEN we strongly suggest the installation of a photocell!**

○ **OPEN:** Only opening commands are accepted by the impulse switch – closing the gate with the impulse switch is not possible.

○ **DEAD MAN:** The motor opens as long as the impulse switch is pressed (hold) – closing the gate with the impulse switch is not possible. As soon as the switch is released, the motor stops. **If hold to run operating mode is selected, the radio receiver slot (FE) is set out of order for reasons of safety.**

- If the impulse switch is set to DEAD MAN operation, then the pedestrian button works the same way. With the impulse switch the gate is opened, with the pedestrian button it is closed.
- **IMPORTANT: Do not put into operation in dead man mode. Select only after putting into operation** *(➔ page 22)*, **if desired.**

Push buttons, key switches or external radio receivers with potential-free N.O. contacts can be used as impulse switches.

Pedestrian button (terminals 30/34)

⊙ **OPEN/STOP/CLOSE successive impulses:** An impulse through the pedestrian button-while the gate is in motion-causes gate stopping. If the gate is within the pedestrian area, then an impulse through the pedestrian button causes inversion of the direction.
If the gate is in complete open position an impulse through the pedestrian button causes a movement in CLOSE direction and the gate stopps at pedestrian OPEN position.

○ **OPEN/CLOSE/OPEN successive impulses:**
If the gate is within the pedestrian area, then an impulse through the pedestrian button causes inversion of the direction.
If the gate is in complete open position an impulse through the pedestrian button causes a movement in CLOSE direction and the gate stopps at pedestrian OPEN position.

- **In this operation mode it is not possible to stop the motor with the pedestrian button – it always moves until reaching an end position. (Opened or closed position).**
- **for the function OPEN/CLOSE/OPEN we strongly suggest the installation of a photocell!**

○ **OPEN:** Only opening commands are accepted by the pedestrian button – closing the gate with the pedestrian button is not possible.

○ **DEADMAN:** The motor closes as long as the pedestrian switch is pressed (hold) – opening the gate with the pedestrian switch is not possible. As soon as the switch is released, the motor stops. **If hold to run operating mode is selected, the radio receiver slot (FE) is set out of order for reasons of safety.**

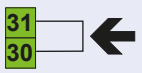
The DEADMAN function can not be chosen actively but is set automatically as soon as the impulse button is set to DEADMAN mode.

Push buttons, key switches or external radio receivers with potential-free N.O. contacts can be used as pedestrian button.

STOP-switch (terminals 30/31)

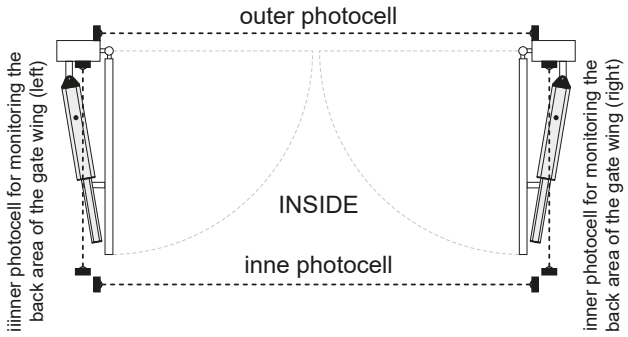
- when pressing the stop switch the gate stops in any desired position.

As stop switch a break contact has to be used.
If no stop switch is connected, terminals 30/31 have to be wire-bridged.



The stop input has no emergency stop function! - In order to ensure the emergency stop function, provide the supply line with an all-pole disconnecting emergency stop switch, that locks after actuation!

INNER AND OUTER PHOTOCELL

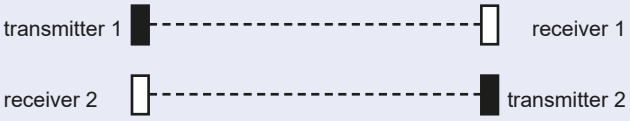


- *energy saving mode* ***(only if no radio transmission system TX 310 is used):*** photocell transmitter is turned off when gate is closed.
- With **additional inner photocells** the back area of the gate can be monitored. (All inner photocells are then set in series at control terminals 45/46 (terminals for inner photocells)).
- The exact function of the photocells depends on the programming of the control unit: **Photocell functions** *page 13.*

Important: notes for photocells

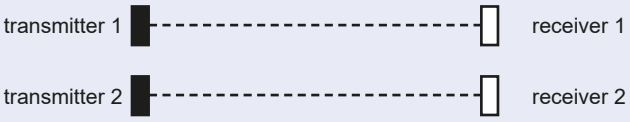
- **The control unit has a power supply connection for a 24V a.c. photocell (LS):**
  supply LS-transmitter: terminals 41/42 / supply LS-receiver: terminals 43/44
  Note: in „gate closed“ position the terminals 41/42 are being switched into energy saving mode (no current) (only if the radio transmission system TX 310 is not used) !
- **At supplied and positioned photocells the contact has to be closed (make contact).**
  Connection of outer photocell contact: terminals 45/48, inner photocell contact terminals 45/46
- **When using two pairs of photocells please do not install both photocell transmitters/receivers on the same side (to eleminate interference between both) !**

Standard:



Exception: photocells with SYNC function allow the installation of both photocell transmitters/receivers on the same side without causing interference to each other.

with SYNC-Function:



- **Self-monitoring of photocells:** The control unit has a monitoring function for the connected photocells. A test will be triggered by each ipumlse and will be checked if the receiver of the photocell responds to the signal from the photocell transmitter. If there is no communication between the photocell receiver and transmitter the control unit responds with an error. **The deactivation of the self-test function is only permitted if the safety installations correspond to the category 3 !**
- The exact function of the photocells depends on the programming of the control unit.
  Photocell functions *see menu point SAFETY/inner (outer) photocell function, resp. photocell with pause time* *(page 13).*
- **Detailed information you will find in the corresponding photocell manual.**

G Inner photocell (contact: terminals 45/46)

⊙ **active:** to be selected, if inner photocell should be triggered.

○ **not active:** to be selected, if inner photocell should not be triggered.

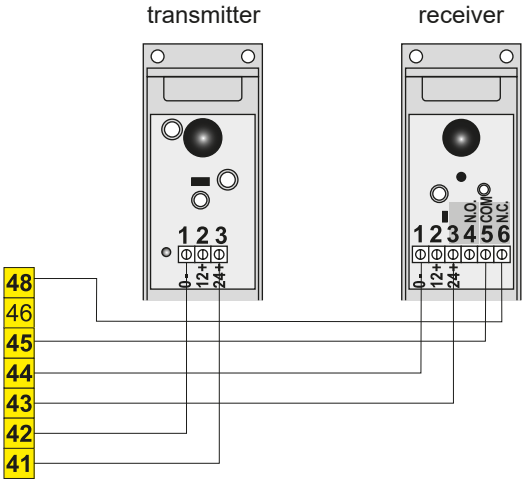
G Outer Photocell (contact: terminals 45/48)

⊙ **active:** to be selected, if outer photocell should be triggered.

○ **not active:** to be selected, if outer photocell should not be triggered.

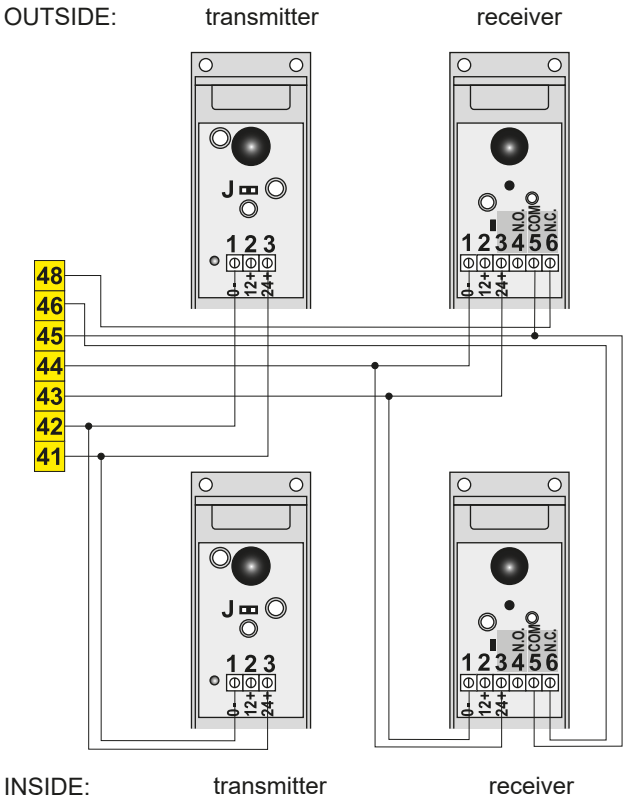
Photocells - connection examples

Outer photocell
Tousek LS 41 as safety device



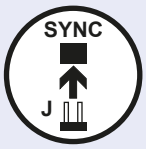
Outer and inner photocell
Tousek LS 41 as safety device

with active SYNC-function

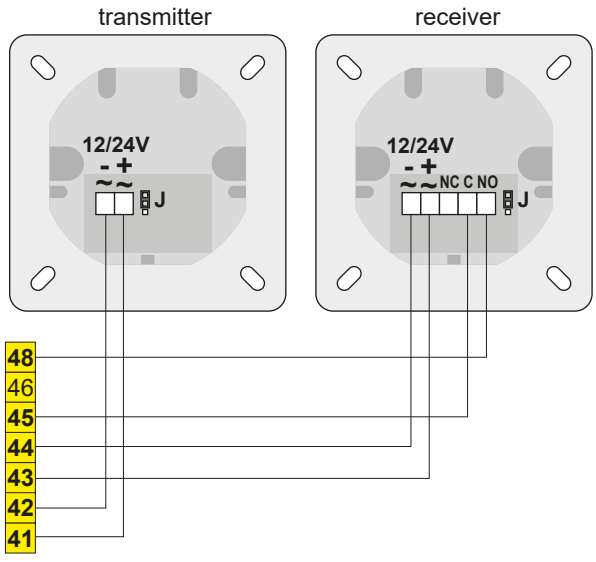


Important

- **To activate** the SYNC-function, the plug-in bridges **(J)** in both photocell transmitters **have to be removed.** *(see manual LS 41).*



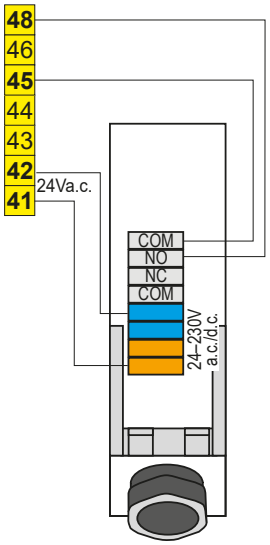
Outer photocell
Tousek LS 26 as safety device



Important

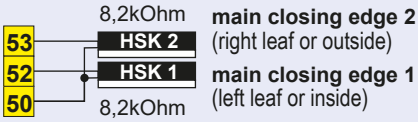
- **Jumper J of transmitter and receiver has to be adjusted in the same way.**

Outer reflective photocell
Tousek RLS 610
as safety device



Safety sensing edges (main closing edge 1 + 2)

- **OBSTACLE DETECTION:** when a contact strip/safety edge is triggered/activated then a change of direction is effected for 1 second. Then the gate stops.
- The activation of the safety sensing edges is made in menu **„Safety / main closing edge 1“** (term. 50/52) and **„Safety / main closing edge 2“** (term. 50/53)
- If in the menu item **„operating logic / closing edge“** (*page 17)* one of the modes **„left / right“** or **„inside / outside“** is selected - this results in the wiring of the safety contact edges to make with each other and the connection to the control terminals.

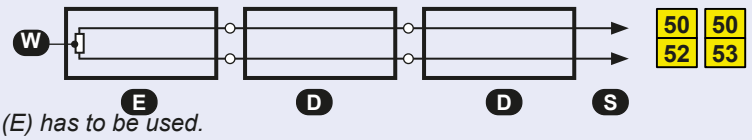


Safety sensing edges in mode **„left/right“**, that should react on an obstacle at the left (right) leaf, have to be connected (serially) to the connection clamps of the main closing edge 1 (2) .

Safety sensing edges in mode **„inside/outside“**, which should react on an obstacle at the inner (outer) side of the leaf, be connected (serially) to the connection clamps of the main closing edge 1 (2)

Example:

W	**8,2kΩ final resistance**
E	**final edge**
D	**passage edge**
S	**to the control board**



When connecting one safety edge a final edge (E) has to be used.

G Main safety edge 1 (terminals 50/52)

Safety

- ⊙ **active:** to be selected if the contact strip (8,2kOhm) of main safety sensing edge 1 should be evaluated.
- ○ **not active:** to be selected if the contact strip of main safety sensing edge 1 should not be evaluated
- ○ **radio edge TX310:** to be selected if safety sensing edge (8,2kΩ) of main entrance edge 1 should be evaluated **with the radio transmission system TX 310**.

G Main safety edge 2 (terminals 50/53)

Safety

- ⊙ **active:** to be selected if the contact strip (8,2kOhm) of main safety sensing edge 2 should be evaluated.
- ○ **not active:** to be selected if the contact strip of main safety sensing edge 2 should not be evaluated
- ○ **radio edge TX310:** to be selected if safety sensing edge (8,2kΩ) of main entrance edge 2 should be evaluated **with the radio transmission system TX 310**.

- *Connection and detailed information of radio transmission system TX 310 see according manual.*

Important (for programming)

- **IMPORTANT: during programming of motor the contact safety edges should not be triggered as this leads to an error message - the limit stops have to be placed correspondingly.**

Photocell function inside

Safety

- ⊙ **during closing reverse:** an interruption of the photocell during closing makes the gate reverse (open). In automatic mode the gate closes as soon as the pause time has run out. In impulse operation another closing command has to be given.
- ○ **stop - after release open:** an interruption of the photocell beam during opening or closing makes the motor stop as long as the photocell stays interrupted. After release of the photocell, the gate opens. In automatic mode the gate closes as soon as the pause time has run out, in impulse operation another closing command has to be given.
- ○ **during opening stop - then open:** an interruption of the photocell during opening makes the motor stop as long as the photocell stays interrupted. After release of the photocell, the gate opens. (back area monitoring). In automatic mode the gate closes as soon as the pause time has run out, in impulse operation another closing command has to be given.

Photocell function outside

Safety

- ⊙ **during closing reverse:** an interruption of the photocell during closing makes the gate reverse (open). In automatic mode the gate closes as soon as the pause time has run out. In impulse operation another closing command has to be given.
- ○ **stop - after release open:** an interruption of the photocell beam during opening or closing makes the motor stop as long as the photocell stays interrupted. After release of the photocell, the gate opens. In automatic mode the gate closes as soon as the pause time has run out, in impulse operation another closing command has to be given.

PHC-pause time

Safety

- ⊙ **no influence of photocell:** the photocell doesn't have any influence on the pause time in automatic mode.
- ○ **abort pause time:** in automatic mode an interruption of the outer photocell during pause time shortens the pause time. After release of the photocell the gate starts closing.
- ○ **re-start pause time:** in automatic mode an interruption of the outer photocell during pause time, restarts the pause time. As soon as the pause time has run out, the gate closes.
- ○ **immediate close after opening:** If the outer or inner photocell is interrupted during the opening movement or if the outer photocell is interrupted in open position, then the gate begins to close after the release of the photocell.

PHC-self test

Safety

- ⊙ **active:** photocell self-test is executed with an opening impulse (switch, button) in gate position „closed".
- ○ **not active:** photocell self-test is not executed

Attention

- **The photocell self-test can only be deactivated by selecting „not active".**
- **The deactivation of the self-test function is only permitted if the safety installations correspond to the category 3 !**

Important: notes for connection and adjustment of operators

- It is possible to connect 2 motors 230V (max. 500W/motor) with control board ST51.
- **Attention: Before carrying out any installation and connection works, the power supply of the gate facility has to be turned off.**
- **Please pay attention that after turning on the power supply and giving an impulse the gate wings have to open. In case that they don‘t open, for the left operator terminals 20/22 and for the right one terminals 24/26 have to be crossed out.**

Important: At operation with a single motor, the other motor input has to be deactivated by choosing „MOTOR OFF“. If the LEFT (RIGHT) wing is set to OFF in the menu, no motor may be connected with the concerned wing.

Important: OPERATION ADVICE FOR ELECTROHYDRAULIC GATE OPERATORS

When connecting electrohydraulic operators to the ST50 please notice that the softstop function has to be deactivated and that the force control of the ST50 should be adjusted to the maximum. The force control adjustment is made directly on the operators *(see the corresponding instruction manual of the operator)*

Due to the stronger temperature dependence and the greater reaction inertia of hydraulic drives, it is necessary to add a **reserve time of min. 5s** to the average **running times OPEN and CLOSE** to ensure that the end positions are always reached.

Mandatory settings of the control unit for electrohydraulic operators:

Softstop time **= 0** • max force OPEN **= 100%** • max. force CLOSED **= 100%** • runtime OPEN/CLOSE **+ min. 5s reserve time**

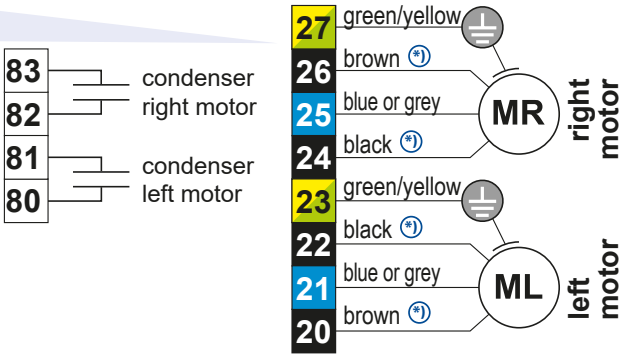
Warning

- **Before taking off the housing cover the main switch has to be turned off !**
- **IMPORTANT: At force adjustment** *(see Left(Right) wing)* **the valid safety regulations and standards have to be strictly followed!**
- **Follow safety instructions** *(page 8)* **!**

Important (TURN 310UF, SPIN)

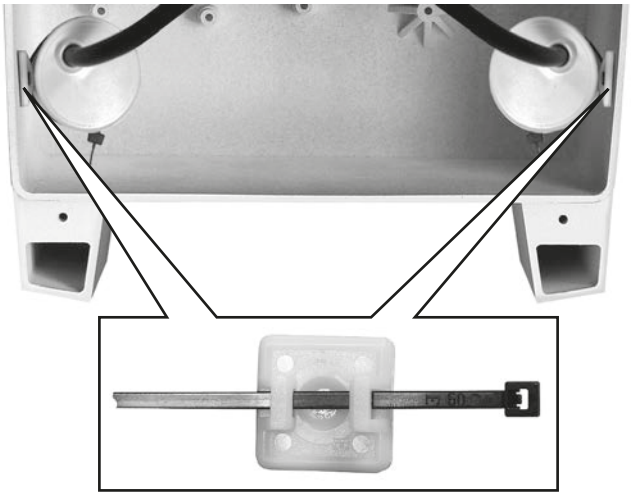
The operators TURN 310UF and SPIN differ from the wiring diagram:

Left operator: **black > term. 20 / brown > term. 22**
Right operator: **black > term. 26 / brown > term. 24**



Connection of condensers for operators

- **ATTENTION: the control unit should be switched-off before the connecting works of the condensers begin !**
- 2 condensers have to be connected to the ST50 as follows:
  for **left operator** use the **clamps 80/81**
  for **right operato**r use the **clamps 82/83**
  (please see connecting diagram above)
- To fix the 2 condensers inside the operator housing please use the sockets. After having mounted the condensers with the lace to the sockets they should be fixed on the inside of the operator control housing.
- The placement of the condensers can be chosen freely, but we recommend the lower area of the operator control housing, as shown on picture.



Left leaf

G Left motor (terminals 20/21/22, grounding: 23)

Left leaf

⊙ **motor ON**

○ **motor OFF**

left motor

INSIDE

Important

- **If a left operator is not available then set here to „MOTOR OFF“!**

G Delay left leaf

Left leaf

⊙ **opening delay:** the left leaf opens after the adjusted delay time.

○ **closing delay:**the left leaf closes after the adjusted delay time.

G Delay time left ⊙ 2s (factory setting)

Left leaf

○ **0–25s delay time adjustable:** indicates the delay time at opening or closing.

Runtime OPEN ⊙ 20s (factory setting)

Left leaf

○ **0–90s adjustable:** defines the run-time in opening movement incl. soft stop time.

Runtime CLOSE ⊙ 20s (factory setting)

○ **0–90s adjustable:** defines the run-time in closing movement incl. soft stop time.

Max. force OPEN ⊙ 70% (factory setting)

○ **30–100% adjustable:** indicates the motor force during the opening movement.

Max. force CLOSE ⊙ 70% (factory setting)

○ **30–100% adjustable:** indicates the motor force during the closing movement.

Soft stop time ⊙ 5s (factory setting)

○ **0–25s adjustable:** indicates the set softstop time.

Important

Mandatory settings of the control unit for electrohydraulic operators *(page14)*:

runtime OPEN **+ min. 5s reserve time**

runtime CLOSE **+ min. 5s reserve time**

max. force OPEN **= 100%**

max. force CLOSE **= 100%**

soft-stop time **= 0s**

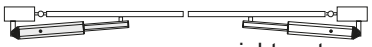
Right leaf

G Right motor (terminals 24/25/26, grounding: 27)

Right leaf

⊙ **motor ON**

○ **motor OFF**



right motor

INSIDE

Important

- **If a right operator is not available then set here to „MOTOR OFF“!**

G Delay right leaf

Right leaf

○ **opening delay:** the right wing opens after the adjusted delay time.

⊙ **closing delay:** the right wing closes after the adjusted delay time.

G Delay time right ⊙ 2s (factory setting)

Right leaf

○ **0–25s delay time adjustable:** indicates the delay time at opening or closing.

Runtime OPEN ⊙ 20s (factory setting)

Right leaf

○ **0–60s adjustable:** defines the run-time in opening movement incl. soft stop time.

Runtime CLOSE ⊙ 20s (factory setting)

○ **0–90s adjustable:** defines the run-time in closing movement incl. soft stop time.

Max. force OPEN ⊙ 70% (factory setting)

○ **30–100% adjustable:** indicates the motor force during the opening movement.

Max. force CLOSE ⊙ 70% (factory setting)

○ **30–100% adjustable:** indicates the motor force during the closing movement.

Soft stop time ⊙ 5s (factory setting)

○ **0–25s adjustable:** indicates the set softstop time.

Important

Mandatory settings of the control unit for electrohydraulic operators *(14)*:

runtime OPEN **+ min. 5s reserve time**

runtime CLOSE **+ min. 5s reserve time**

max. force OPEN **= 100%**

max. force CLOSE **= 100%**

soft-stop time **= 0s**

Impulse button
Operating logic

- ⊙ **stop, start of pause time:** a command of the impulse switch during movement stops the gate and starts the pause time in automatic operation – as soon as the pause time has run out, the gate closes automatically.
- ○ **impulse suppression when opening:** commands which are emitted during the opening movement are suppressed. Commands during closing are accepted.
- ○ **pause time extension:** an impulse in automatic operation restarts the pause time. If this menu point is chosen, the impulse suppression during opening is active at the same time.

G Operating mode
Operating logic

- ⊙ **impulse mode:** for initiating the closing movement, an impulse is necessary.
- ○ **automatic closing, pause time adjustable from 1-255s:** gate closes as soon as the adjusted pause time has run out (Exception: ➔ *see adjustment „Automatic mode“ / „only complete opening“).*

Partial opening ⊙ 100% (factory setting)
Operating logic

- ○ **25–100% adjustable:** indicates the partial opening of the gate leaf with closing delay in relation to complete opening width.

This adjustment is ONLY adopted in CLOSED Postion.

Runtime correction ⊙ switched off (factory setting)
Operating logic

- ○ **open +10...switched off...closing +10:** for adjutsment of runtime correction in closing and opening movement. This correction is only effected in situations in which the gate stops during movement and moves into opposite direction. The runtime correction is an important adjustement with the use of electrohydraulic motors.

This adjustment is ONLY adopted in CLOSED Postion.

Automatic mode
Operating logic

- ⊙ **complete/partial opening:** either with complete as well as partial opening, the gate closes automatically after the adjusted pause time.
- ○ **only complete opening:** only after complete opening, the gate closes automatically after the adjusted pause time. Exception: If the gate is in partial open position and an impulse for complete opening arrives then the gate opens completely and after the pause time it returns to partial opening position.
- ○ **only partial opening:** only after partial opening the gate closes automatically after the the adjusted pause time.

Pause time logic
Operating logic

- ⊙ **no influence**
- ○ **permanent open in automatic mode:** If „always open in automatic mode“ and „pause time“ are simultaneaus activated the automatic mode can be deactivated. An impulse in complete open position causes a switch into „impulse mode“ but only for hte current cycle. So the gate stays in OPEN position. The next impulse closes the gate an the control unit switched to „automaitc mode“ again. This function allows that the entrance of a company site stays open during the day (first impulse in complete open position). The gate can be closed with the second impulse e.g. in the evening (second impulse - for closing the gate and switching to the „automatic mode“). The control unit switches to the „automatic mode“ again (automatic opening and closing of the gate).

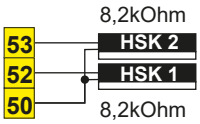
  Note: An impulse through the pedestrian button in the complete open position doesn´t start the „always open“ function. This action causes a movement in CLOSE direction and the gate stopps at pedestrian OPEN position.

  If the gate is in partial open position and „permanent open in automatic mode“ is selected, so it is possible to adjust permanent partial open for this cycle by giving an impulse via pedestrian button. Permanent partial open can be finished analogous to the above described method.

Increase pressure
Operating logic

- ⊙ **OFF**
- ○ **0,1–3,0s adjustable:** at the end of the closing movement the motor force is increased for this time in order to grant a proper locking of the gate.

Closing edges (HSK 1: terminals 50/52, HSK 2: terminals 50/53)



⊙ **left/right:** the safety sensing edges (contact strips) can actuate in every gate movement (OPEN/CLOSE).
Contact edges that should react on an obstacle on the **left leaf** (in serial connect.) should be connected on the terminals of the **main safety edge 1: term. 50/52**.
Contact edges that should react on an obstacle on the **right leaf** (in serial connect.) should be connected on the terminals of the **main safety edge 2: term. 50/53**.

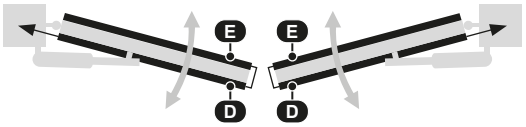
○ **inside/outside:**
Contact edges that should react on an obstacle at the **inside of** the leaf **during opening**, must be connected (serial) on the terminals of the **main safety edge 1: term. 50/52**.
Contact edges that should react on an obstacle at the **outside of** the leaf **during closing**, must be connected (serial) on the terminals of the **main safety edge 2: term. 50/53**.

IMPORTANT ! **ASSIGNMENT AND RESPONSE OF SAFETY EDGES**

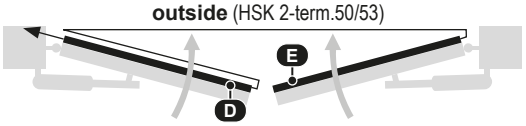
Assignment \ movement			opening	closing
HSK 1	*Mode left/right*	**left**	active	active
HSK 2		**right**	active	active
HSK 1	*Mode inside/outside*	**inside**	active	
HSK 2		**outside**		active

Examples: **(D)** passage edge, **(E)** final edge

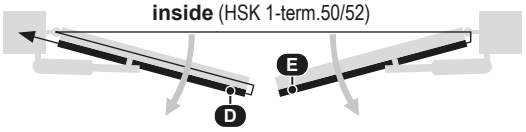
left (HSK 1 - term.50/52) **right** (HSK 2 - term.50/53))



outside (HSK 2-term.50/53)



inside (HSK 1-term.50/52)



Lights / Lamps

Prewarning OPEN (terminals 10/11)

⊙ **turned off**

○ **1–30s adjustable:** before each opening movement the flashing light is activated for the adjusted time.

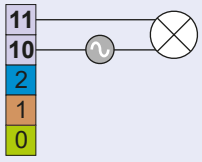
Prewarning CLOSE (terminals 10/11)

⊙ **turned off**

○ **1–30s adjustable:** before each closing movement the flashing light is activated for the adjusted time.

Important: Notes regarding connection of a flashing light

- **Attention: Before carrying out connection works, the power supply of the facility has to be turned off.**
- A flashing light with 230V, max. 40W can be connected at the terminals 10/11.



Warning

- **Before taking off the housing cover the main switch has to be turned off !**
- **Follow safety instructions** *(page 8)* **!**

Electric lock (module terminals 72/73 page 20)

⊙ **switched off**

○ **1–10s adjustable:** The electric lock is activated by push button impulse or impulse from pedestrian button for a period of time set here to ensure the release depending on the gate situation

Reverse stroke (only with activated locking!)

⊙ **switched off**

○ **0,5–8s adjustable:** Only with activated lock (electric lock or motorized locking bar): After an impulse is given, a short closing movement for unlocking (for example, the E-lock) is initiated first, the unlocking is performed and the door is opening. With an electric lock, the reversal stroke is only carried out in the opening direction. With a motor bolt, depending on the setting, it is possible to set the reversal stroke also in the closing movement.

Locking

⊙ **e-lock/magnetic clamp:** with additional module electric lock/magnetic clamp.

○ **motor lock:** with additional module motorized locking bar.

Drop bolt

⊙ **OPEN and CLOSE:** locking via motorized locking bar in both end positions of the gate.

○ **only OPEN:** lockingvia motorized locking bar only in open position.

○ **only CLOSE:** locking via motorized locking bar only in closed position.

drop bolt opening delay ⊙ 3s (factory setting)

○ **1–5s adjustable:** The drop bolt will be triggered for the here adjusted time before the gate movement. This adjustment is necessary to ensure the safe gate movement start.

WARNING: • **Before taking off the housing cover the main switch has to be turned off !**
• **Follow safety instructions!** *(page 8)*

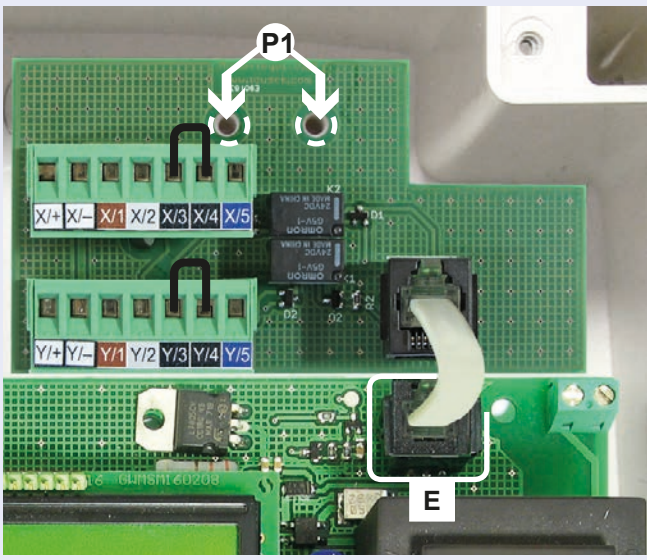
DROPBOLT CONNECTION

optional dropbolt module

- In order to connect the dropbolt SAFELOCK to the control unit it needs an optional modul and a dropbolt control unit. If needed then for double leaf swing gate also two dropbolts can be connected. Thereby the terminal block is labelled with **„X“** for the first bolt and with **„Y“** for the second bolt.

Modul connection

- **ATTENTION: Turn off the power supply!**
- Fix the module inside the control unit´s housing as shown on the picture. Fix the module on the positions **(P1)** by spacers and screws (included).
- Connect the modul to the control unit with RJ-plug connection **(E).**
- Carry out the connections on the modul clamps **„X“, „Y“** and on the motor control unit clamps as shown on the picture.
- After succesful connection the dropbolt operation need to be activated in the control unit menu („peripherials/locking“ and „peripherials/dropbolt“)



ST 51 with integrated dropbolt modul

IMPORTANT: If only one motor bolt is used, the wire jumper must remain in the unused terminal strip!

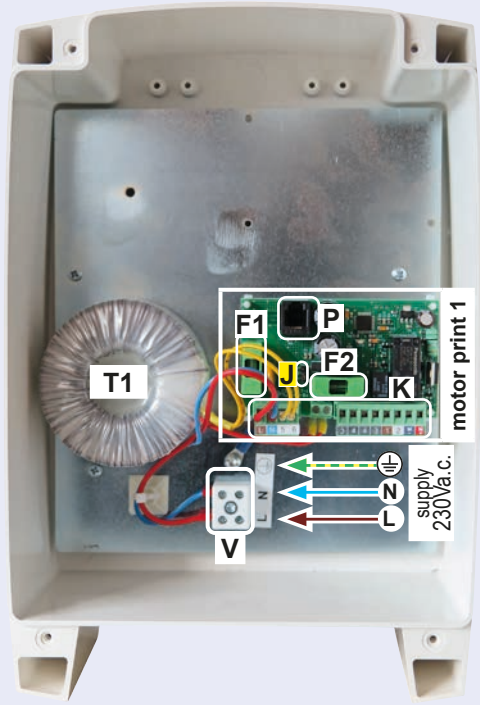
Dropbolt control unit

Wire the terminal block **(K)** of the dropbolt´s printed circuit board as shown on the picture::

- on one hand wire it with the module, which is connected to the operator´s control unit:
  - for 1 dropbolt: wire only with the terminal block „X“ - for 2 dropbolts wire with terminal blocks „X“+“Y“
- on the other hand wire it with the dropbolt via connection cable 4 x 0,75² (motor connection and limit switch) . Strictly note the numbering **1 – 4** of the connection cable´s wires for a proper connection.
- Carry out the 230V a.c. power supply connection on terminal block **(V)** and the earthing connection on the earthing screw.

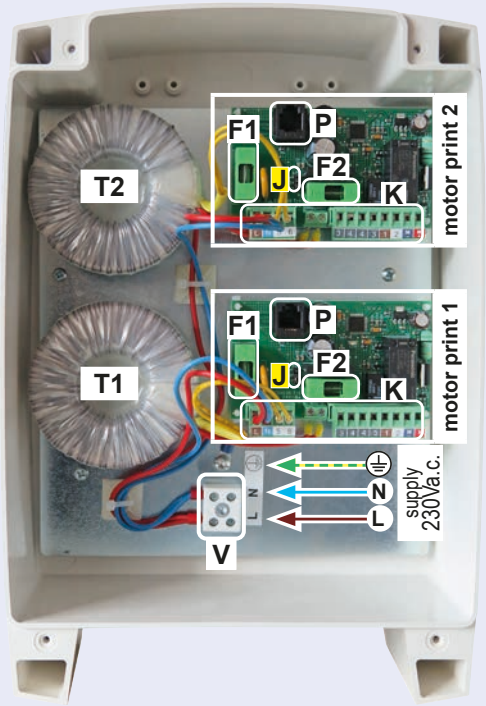
SAFELOCK-control unit with 1 motor print:

- suitable for 1 dropbolt
- connection motor print: with „X“-terminal block

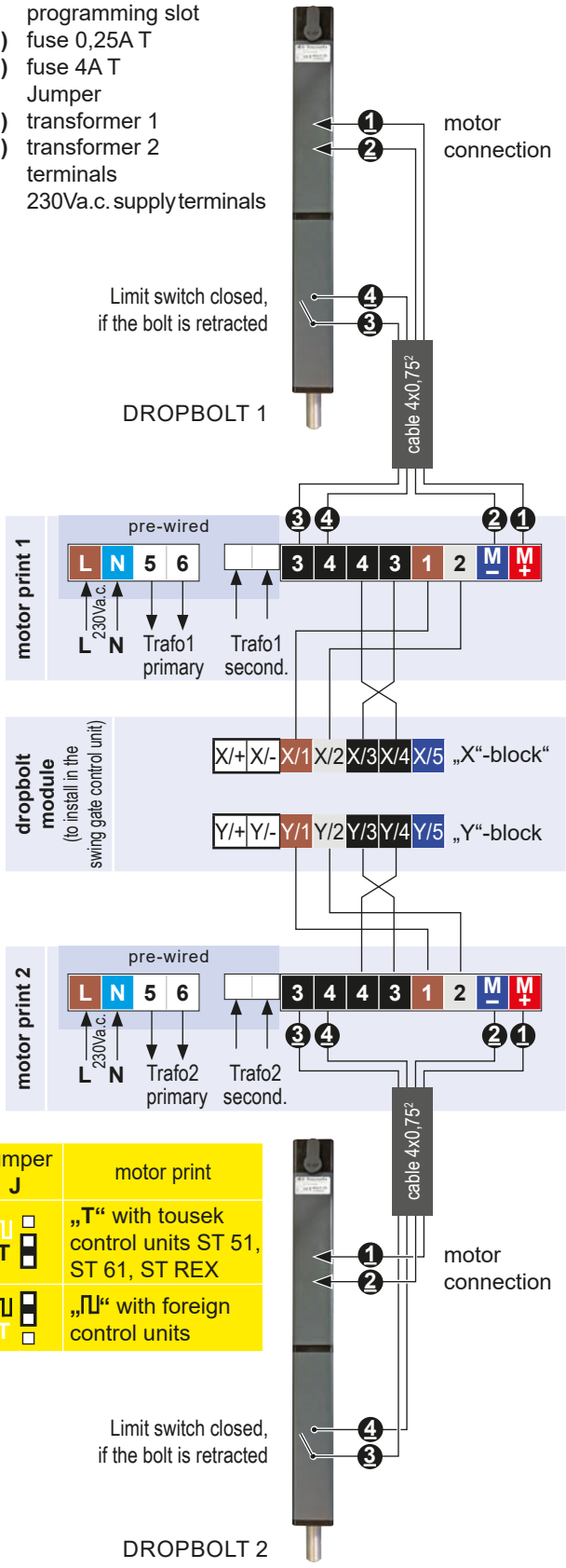


SAFELOCK-control unit with 2 motor prints:

- suitable for 2 dropbolts
- connection motor print 1: with „X“-terminal block
- connection motor print 2: with „Y“-terminal block



(P) programming slot
(F1) fuse 0,25A T
(F2) fuse 4A T
(J) Jumper
(T1) transformer 1
(T2) transformer 2
(K) terminals
(V) 230Va.c. supply terminals

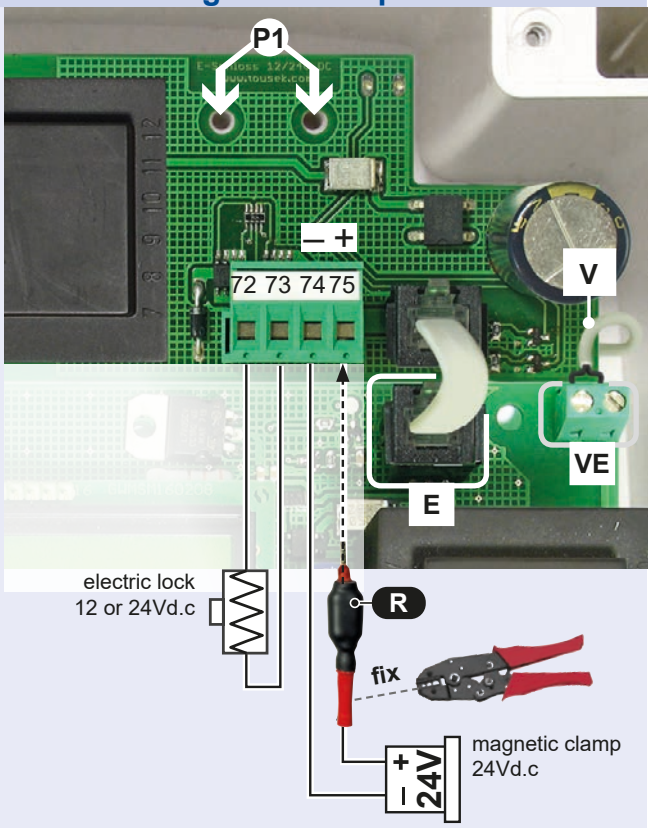


Optional module for electric lock/magnetic clamp

- The control unit needs an optional module for connection of an electric lock/magnet (12V or 24Vd.c. version depending on electric lock).

Connection of module

- **ATTENTION: turn off power supply!**
- Fix the module as illustrated in the control with screws at position **(P1).**
- Connect electric lock module via RJ-plug **(E)** with the control unit.
- Connect the electric lock (12/24Vd.c.) to the removable terminals **72/73** of the module.
- The magnet (24Vd.c.) must be connected via a resistor **(R)** for the connection to the module.
- To do this, push the connecting cable of the magnetic clamp as shown into the opening of the series resistor and fix by means of crimping pliers.
- Connect the connection cable and resistor **(R)**, as shown, to the removable terminals **74 (–) / 75 (+)** of the module. **Pay attention to polarity.**
- The supply is connected to the 2-pin connector cable **(V)** to the control terminals **(VE)**.
- After wiring, the E-lock-mode has still to be activated in the menu of the control under LIGHT PERIPHERAL / ELECTRIC LOCK
- Magnets are driven into the open and closed position of the gate, the electric lock only in closed position.



The series resistor (R) is for tousek magnets GD 50 and GD 70.

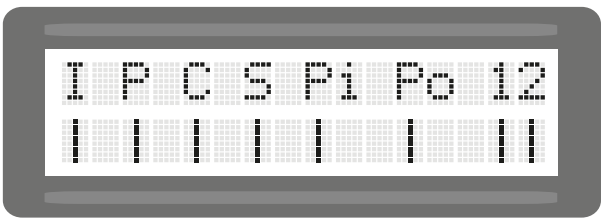
Diagnosis

Status display

➲ **status display** for inputs as photocell, safety sensing edges, stop button, impulse switch....

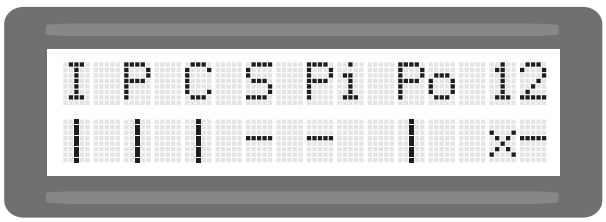
I	impulse switch
P	partial opening switch
C	CLOSE-switch
S	STOP-switch
Pi	photocell inside
Po	photocell outside
1	safety edge main closing edge 1
2	safety edge main closing edge 2

▮	Status: not triggered
▯	Status: triggered
✕	Status: contact strip not connected or defect
▢	Status: contact strip or photocell deactivated in menu



All inputs OK.

e.g.



Impulse-, pedestrian - and close button not triggered.
STOP-button and photocell inside are triggered.
Photocell outside is not triggered.
Contact strip 1 not connected or defect.
Contact strip 2 is triggered.

Factory setting

⊙ **NO:** no reset to factory setting

○ **YES:** reset to factory setting

Note: The factory settings of the single menu points are marked with ⊙ in this manual.

Software version

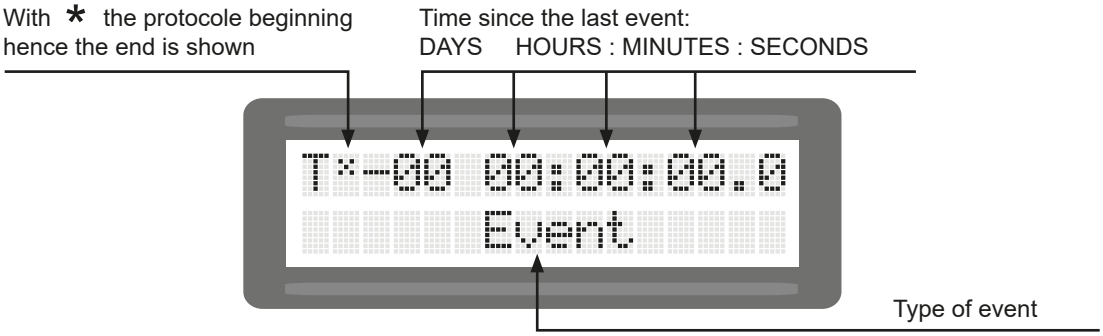
➲ **shows the software version on the text display**

Serial number

➲ **shows the serial number on the text display**

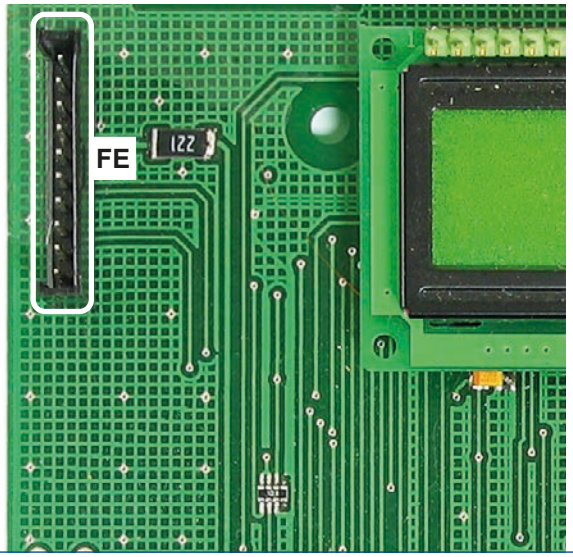
Protocol

➲ **shows the protocole list on display:** all events that take place are protocolled in this list.
with the buttons **+** and **-** the single events can be seen:



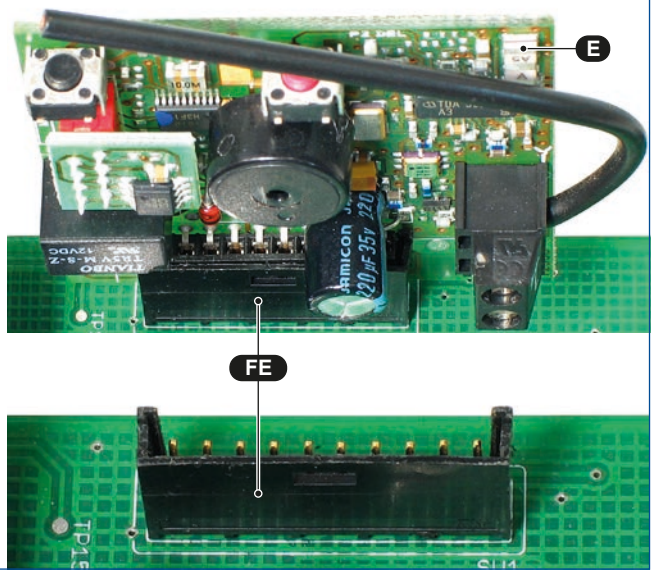
5. Connecting the receiver

- **Disconnect the power supply**
- Plug-in the receiver printed circuit board **(E) RS433/868-STN1 (1 channel) or RS433/868-STN2 (2 channels))** into the corresponding slot **(FE)** as shown in the picture.
- For range extension an external antenna FK433 or FK868 can be connected.



Important

- **With the use of the 2-channel-receiver the second channel takes over the function of the pedestrian entry mode switch.**
- For programming of receiver please ***see manual for radio receiver.***

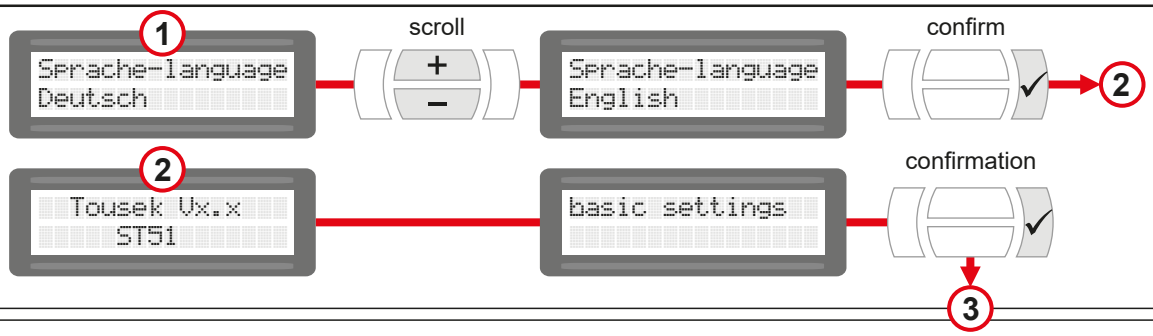


Important: preparation works

- Connect control panels, safety devices to the motor under the safety regulations in .
  Attention: if no stop switch is connected then the terminals 30/31 have to be bridged.
- **The mechanical limits have to be placed so that contact edges are not triggered, as this would lead to an error message**
- Unlock emergency release of operator and set gate to half-opened position. Then lock the operator again
- Then turn on the operator (correct connection necessary).
- **Important:** Putting into operation in Impulse mode (standard setting) and not in dead man mode.
- During initial operation the choice of language is made first, then in the “Basic settings” the adjustment of most important operator settings and after the system test, the automatic detection of limit positions of gate is made..

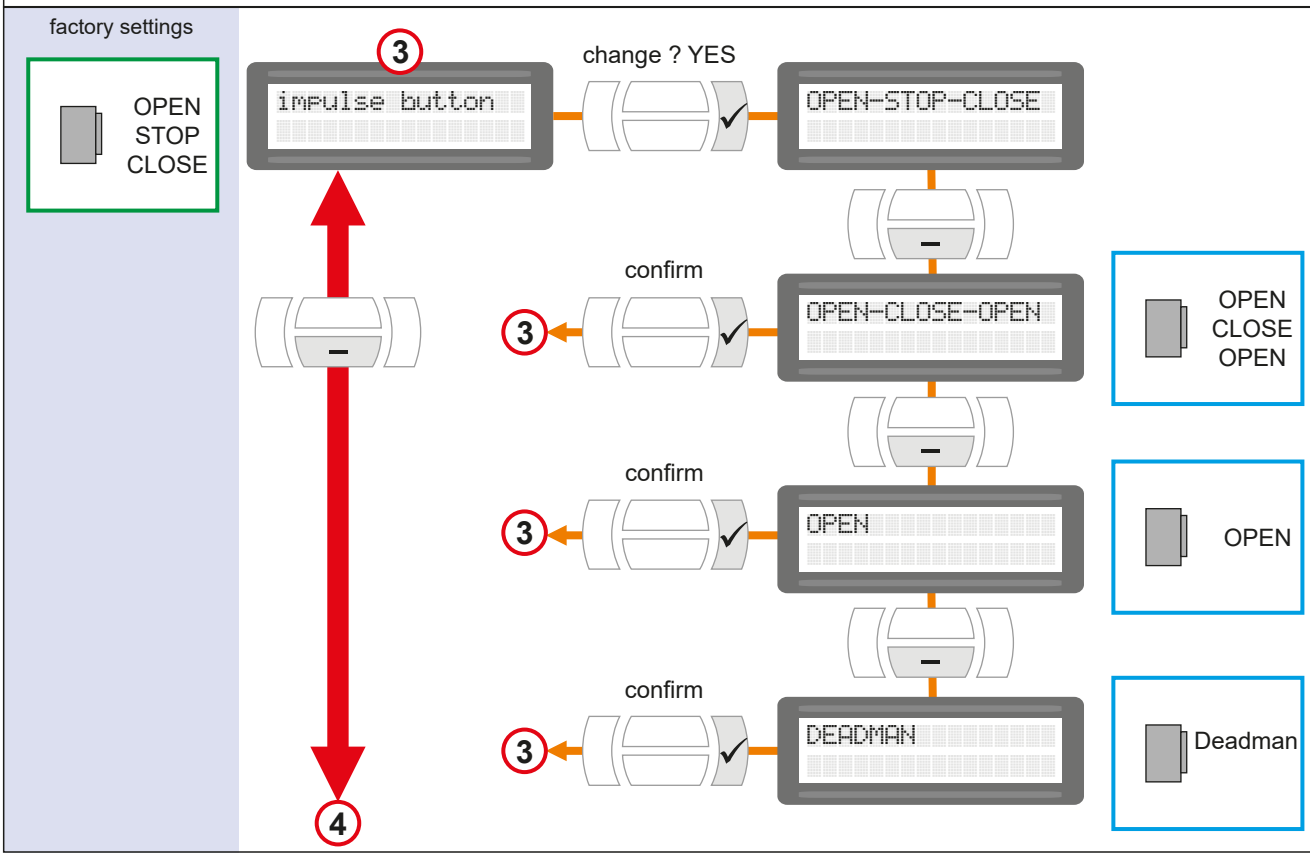
LANGUAGE SELECTION

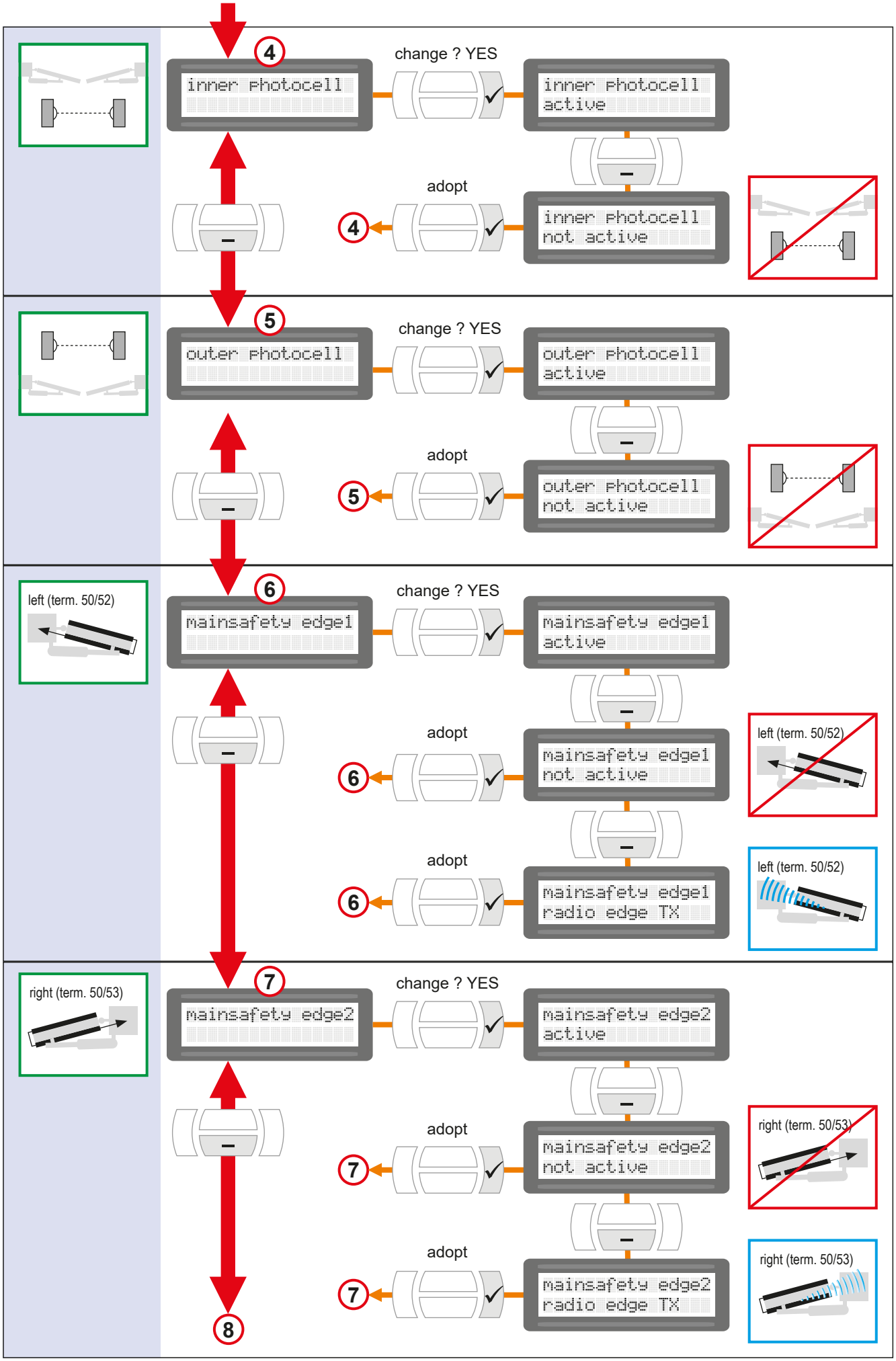
- **Can be selected during initial operation (hence after reset to factory settings).**
- **Can be also chosen by pressing the ESC button ( ) for 5s, from any position in menu.**

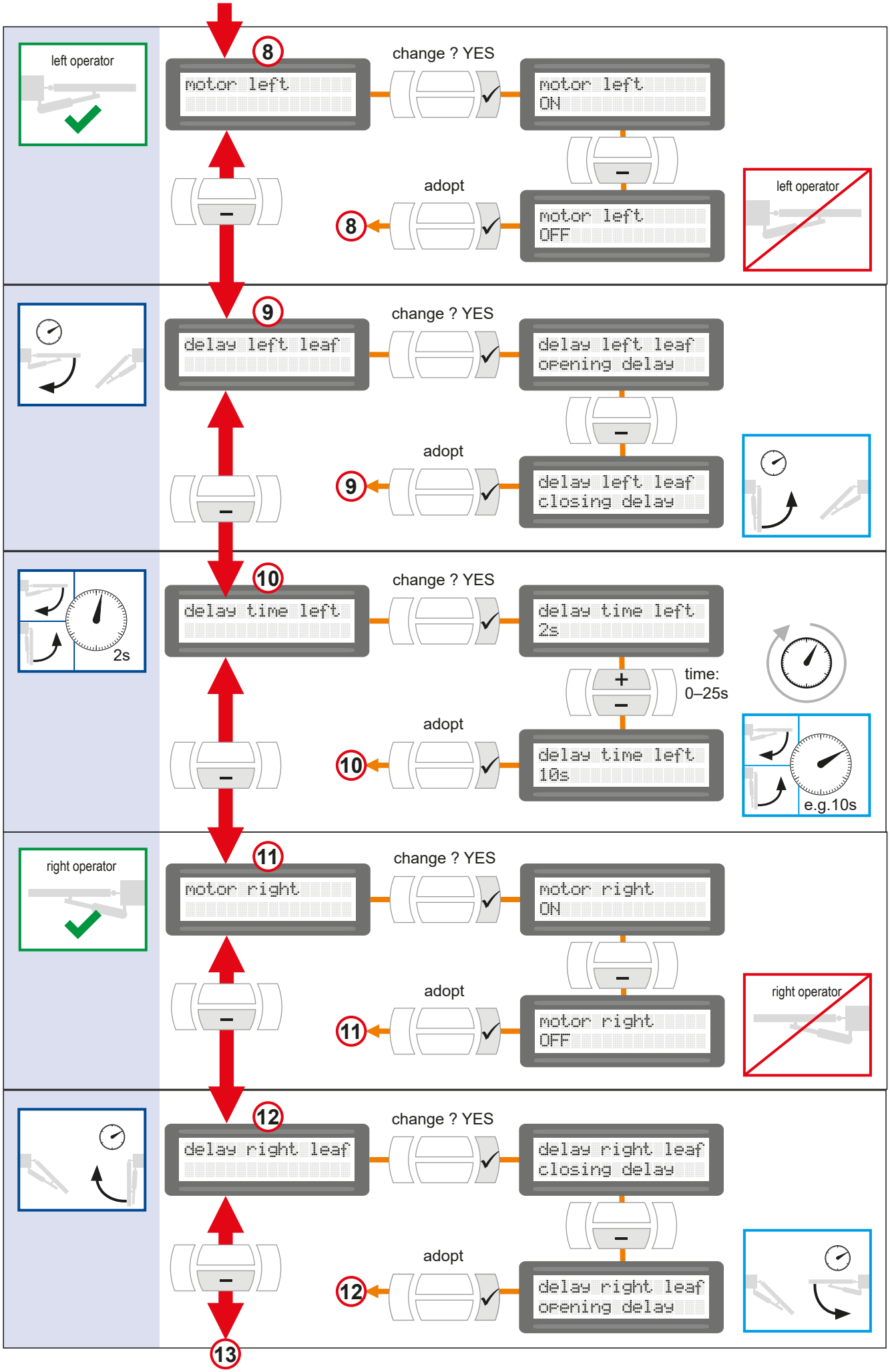


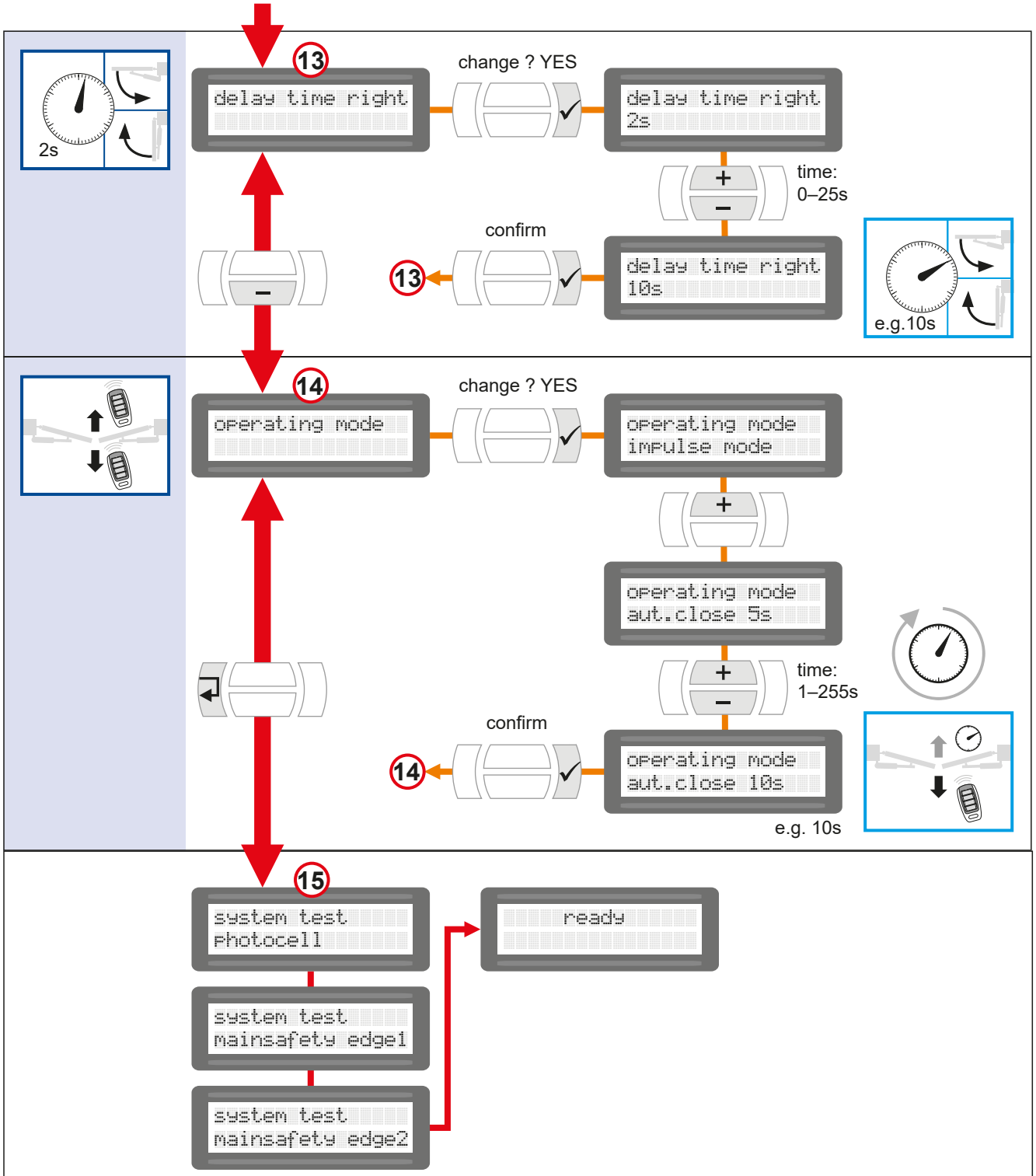
BASIC SETTING

- **For setting the most important adjustments for initial operation of motor.**
- **Can be selected during initial operation (hence when restoring the factory setting).**
- **All safety devices are activated when leaving factory** *(page 7).*
- **The next programming adjustments are made in the main settings menu** *(page 6–7).*




4
inner photocell
change ? YES
inner photocell active
adopt
4
inner photocell not active
5
outer photocell
change ? YES
outer photocell active
adopt
5
outer photocell not active
left (term. 50/52)
6
mainsafety edge1
change ? YES
mainsafety edge1 active
adopt
6
mainsafety edge1 not active
left (term. 50/52)
adopt
6
mainsafety edge1 radio edge TX
left (term. 50/52)
right (term. 50/53)
7
mainsafety edge2
change ? YES
mainsafety edge2 active
adopt
7
mainsafety edge2 not active
right (term. 50/53)
adopt
7
mainsafety edge2 radio edge TX
right (term. 50/53)
8


left operator
8
motor left
change ? YES
motor left
ON
adopt
8
motor left
OFF
left operator
9
delay left leaf
change ? YES
delay left leaf
opening delay
adopt
9
delay left leaf
closing delay
10
delay time left
change ? YES
delay time left
2s
time:
0–25s
adopt
10
delay time left
10s
2s
e.g.10s
right operator
11
motor right
change ? YES
motor right
ON
adopt
11
motor right
OFF
right operator
12
delay right leaf
change ? YES
delay right leaf
closing delay
adopt
12
delay right leaf
opening delay
13



- After setting the desired parameters, the basic program is completed by pressing the ESC key. If you are still in a submenu, press Esc repeatedly until “Ready” can be read on the display.

Important

- **The gate installation (1 or with 2 leaves) has to reflect in the settings of the main menu !**
- **Factory setting: Operation of swing gate with 2 gate leaves, the left and right operator are turned on in main menu: „⊙ Motor ON“.**
- **IMPORTANT: With 1 leaf gate installation, only the operator of the actually existing gate leaf must be activated in the main menu, the other one has to be disabled (deactivated) !**
  (In Main Menu: Left(Right) leaf / Motor / „Motor OFF“)

Error	possible reason	solution
No reaction after emitting a command	mains voltage missing or fuse F1 defective	control of mains voltage as well as of fuse F1
	Display: error stop button	check if stop button is properly connected or bridged
Control relays switch but motor does not run	connection between motor and control defective	check supply lines
Gate opens but does not close	photocell interrupted	check positioning and functions of photocells
Gate opens but does not close completely	force regulation not strong enough	adjust force
	total runtime too low	increase runtime
safety sensing edge 1 or 2 actuated	adjustment of safety sensing edges wrong	remove obstacle or function control via status display
No reaction of radio receiver	radio receiver plugged into wrong connector	check proper installation *see connection of radio receiver*
	no / wrong connected antenna	check antenna connection
	radio transmitter not programmed	program handheld transmitter
Display shows: BROWN OUT	undervoltage	call service technician

8. Dimensioned drawing housing IP54

- dimensions in mm

- Mounting dimensions (back side)

We reserve the right to change dimensions and technical specifications without prior notice !

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