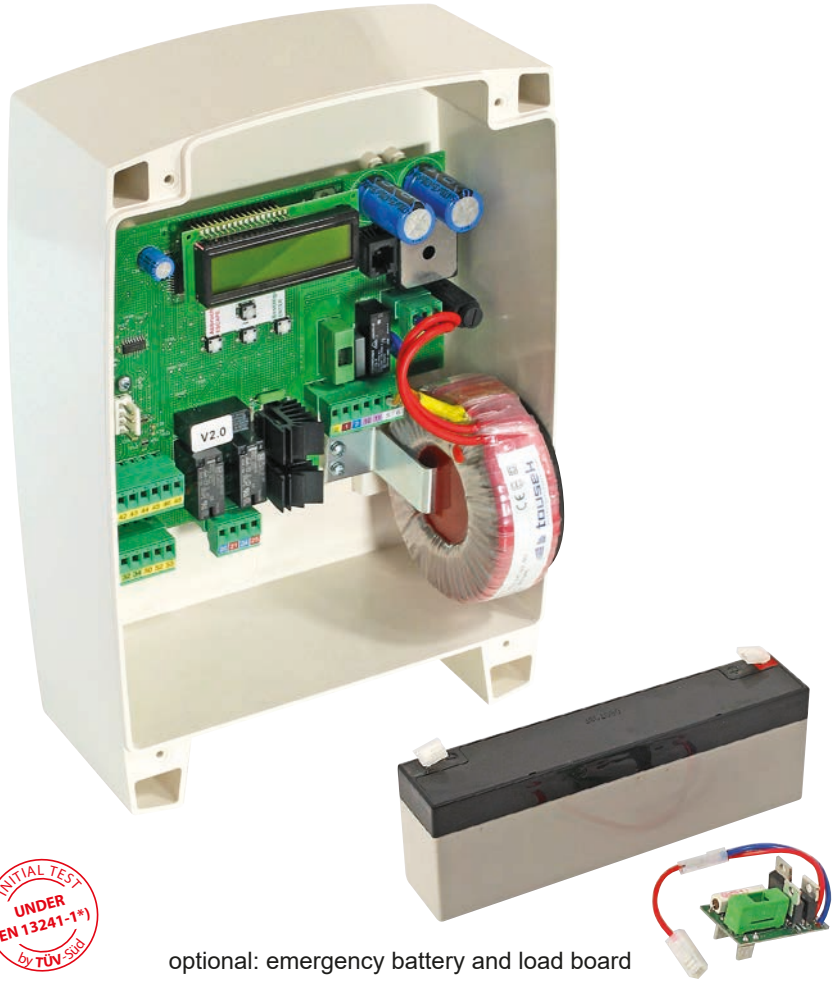
Connection and installation manual

Swing gate control unit ST 12/5



optional: emergency battery and load board

tousek
GATE AUTOMATION

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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 main 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 12/5 complies with the folloleaf directives:

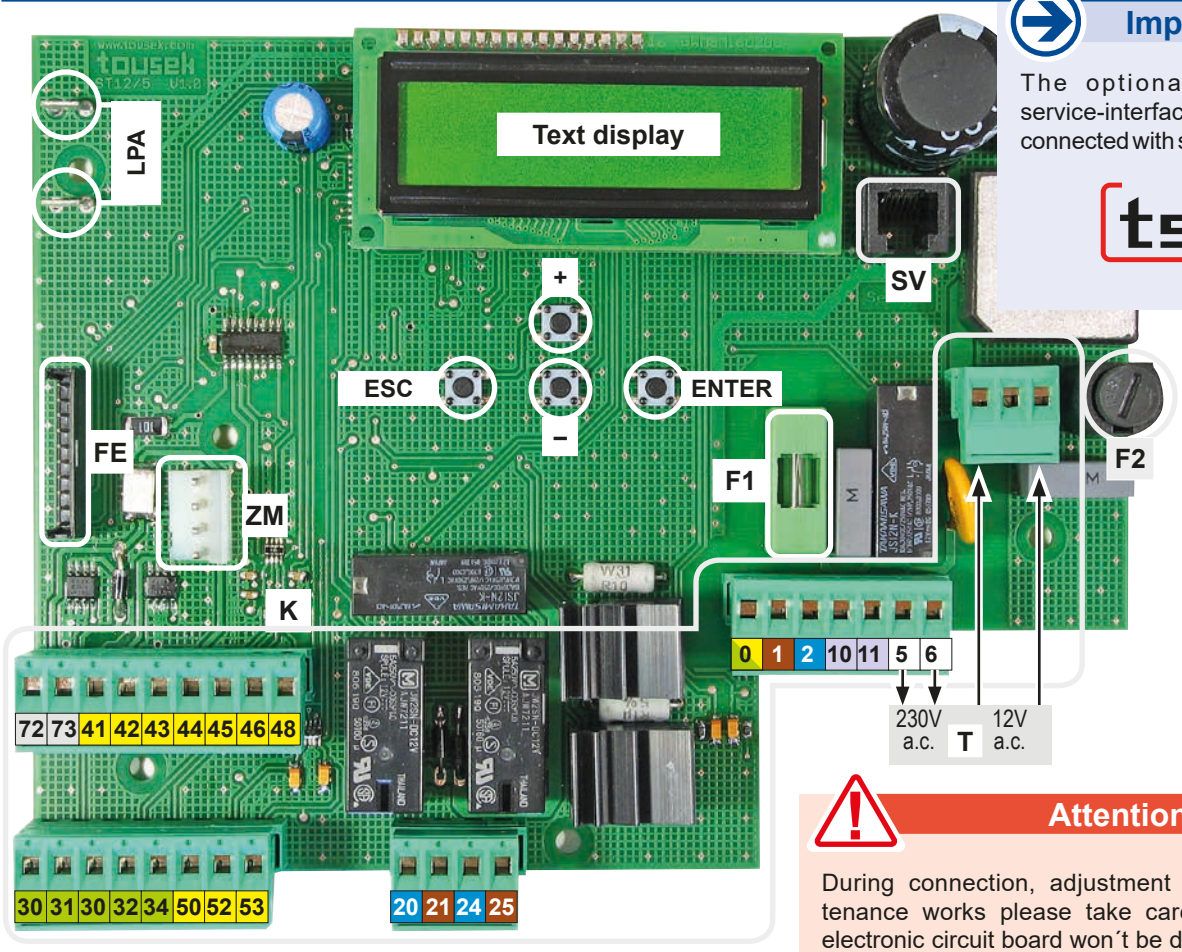
- Low Voltage Directive 2014/35/EU, incl. changes
- Electromagnetic Compatibility Directive 2014/30/EU, incl. changes

May 2019

Control board features

- suitable for 1/2 leafed swing gates with gate automation SLIM-SLR and SLIM-CLR (with integrated limit switches)
- adjustable leaf delay
- ARS (Autom. reversal system - obstacle detection)
- automatic closure with adjustable pause time.
- Additional function for permanent open
- separately adjustable softstop time of both operators
- adjustable force
- Operating mode: impulse-, automatic- or deadman mode
- partial opening for pedestrians (pedestrian function)
- direct connection for 8,2 kOhm safety edges (2-channel)
- self-monitoring of photocells
- self-diagnosis
- electric lock output
- slot for optional radio receiver and additional moudle for gate status or for courtyard lamp/control lamp
- easy programming thanks to text display
- optional: emergency mode with battery

Control board overview



Important

The optional tousek-service-interface must be connected with socket **(SV)**!

Attention

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

Components of the control board

(K) terminal blocks
(SV) service slot (e.g. for software update) or connection with optional tousek-service-interface (TSI)
(FE) slot for optional radio receiver (*p. 21*)
(ZM) slot for optional additional module (*p. 19*)
(LPA) loading board connection for optional emergency battery
(T) transformer
(F1) primary fuse T 2A
(F2) secondary fuse T 10A
Text display and programming keys +, -, ESC and ENTER

Technichal data

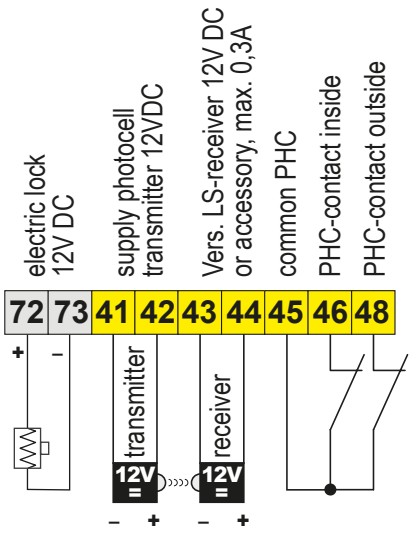
Swing gate control board ST 12/5			
Power supply	230V a.c., +/-10% 50Hz	Ambient temperature	- 20°C bis + 50°C
Motor output	2 x 12V DC, 60W	Protection class	IP54
Flashing light output	230V AC, 50W max.	Battery (optional)	Bleigelakku 12V 2,1Ah
Electric lock output	12V DC, 15W	Art.Num.	12111730
Photocell output	12V DC, 2W		
Optional components	pluggable receiver • backup battery • add. module for courtyard/control lamp or gate status		

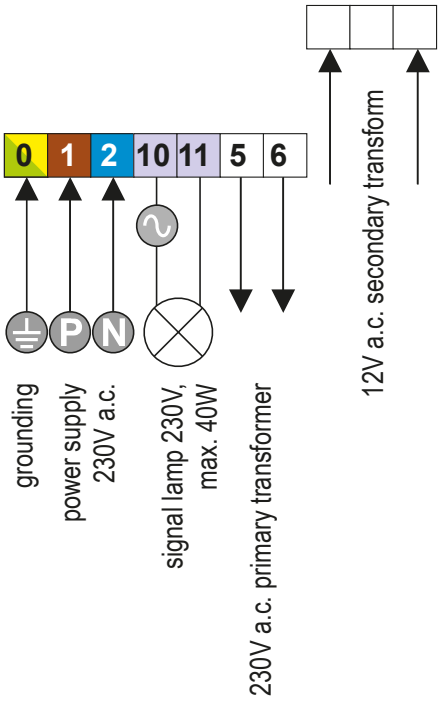
Warning

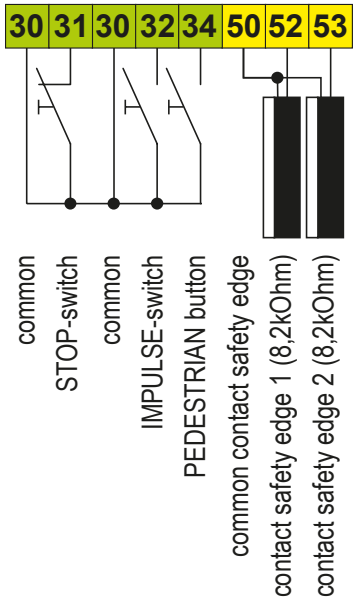
- **Before taking off the control cover, the main switch must be turned off !**
- **If an emergency battery is connected, also disconnect this battery!**
- **The inside of the control unit is under tension when power supplied.**
- **In order to avoid electrical strokes, the safety regulations have to 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 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).**

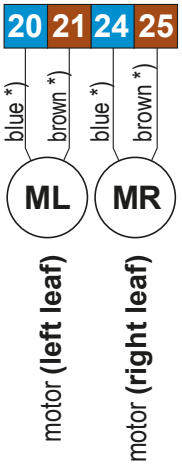
When connecting the operators to the control unit, always pay attention to the door situation, ie whether the door opens inwards or outwards (= special case). The drive connection *(see table)* **and the function of the limit switches** *(see operator manual)* **are dependent on this.**

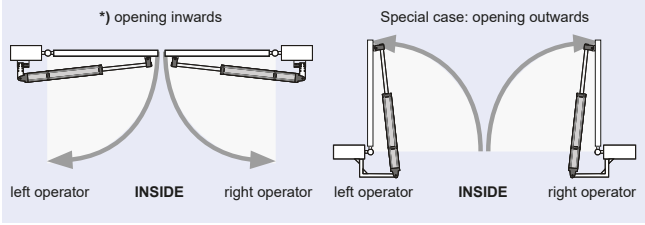
Door situation		*) opening inwards		special case: opening outwards	
Motor		LEFT	RIGHT	LEFT	RIGHT
blue cable	to terminal:	20	24	21	25
brown cable	to terminal:	21	25	20	24









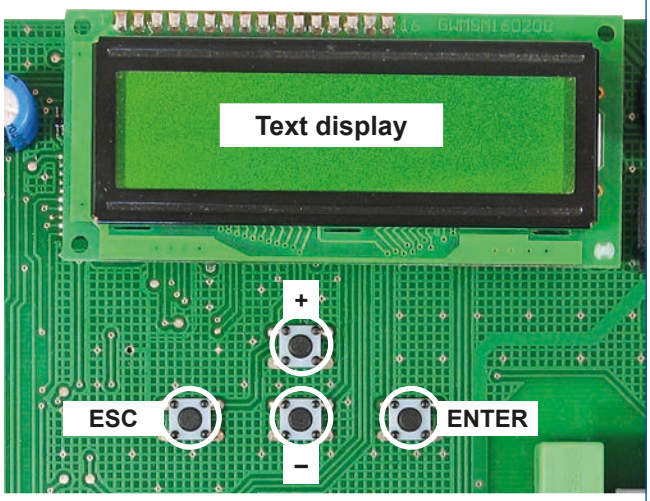


The stop input has no emergency stop function! - In order to ensure the emergency stop function, provide the supply line with an all-pole disconnecting emergency stop switch, that locks after actuation!

Programming keys

- 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“ (MAIN MENU)

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“**.

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 *see 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 *see page 10*	G inner photocell	⊙ active ○ not active	
	G outer photocell	⊙ active ○ not active	
	G main safety edge 1	⊙ active ○ not active	
	G main safety edge 2	⊙ active ○ not active	
	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 of pause time ○ immediate close after opening	
	PHC-self test	⊙ active ○ not active	
left leaf *see page 15*	motor left	⊙ motor ON ○ motor OFF	
	G delay left leaf	⊙ opening delay ○ closing delay	
	G delay time left	○ 0...25s	⊙ = 2s
	ARS response time	○ 0,15...0,95s	⊙ = 0,70s
	max. force	○ 30...100%	⊙ = 70%
	soft stop time	○ 0...25s	⊙ = 5s
right leaf *see page 15*	motor right	⊙ motor ON ○ motor OFF	
	G delay right leaf	○ opening delay ⊙ closing delay	
	G delay time right	○ 0...25s	⊙ = 2s
	ARS response time	○ 0,15...0,95s	⊙ = 0,70s
	max. force	○ 30...100%	⊙ = 70%
	soft stop time	○ 0...25s	⊙ = 5s
operating mode *see page 16*	impulse logic	⊙ stop, start of pause time ○ impulse suppression when opening ○ pause time extension	
	G operating mode	⊙ impulse mode ○ automatic 1...255s	
	partial opening	○ 25...100%	⊙ = 100%
	automatic mode	⊙ complete/partial opening ○ only complete opening ○ only partial opening	
	pause time logic	⊙ no influence ○ permanent open in automatic mode	
	closing edges	⊙ left/right ○ inside/outside	
lights/lamps *see page 18*	prewarning OPEN	○ OFF, 1...30s	⊙ = OFF
	prewarning CLOSE	○ OFF, 1...30s	⊙ = OFF
	courtyard lamp [1]	○ OFF, 5...950s	⊙ = OFF
	control lamp [1]	⊙ illuminates during open and close ○ blinks slowly/illuminates/blinks ○ illuminates in open position	
peripherals *see page 18*	electrick lock	○ OFF, 1...10s	⊙ = OFF
	additional module	⊙ courtyard lamp/control lamp ○ status display 1 ○ status display 2	
diagnosis *see page 20*	status display	➲ status display	
	delete position	⊙ NO ○ YES	
	factory setting	⊙ NO ○ YES	
	software version	➲ shows software version	
	serial number	➲ shows serial number	
	protocol	➲ shows protocole inputs	

Note: Some changes in the functioning or operation logic are accepted only when the gate is closed and the „Ready“ appears on the display.

[1] the menu items courtyard lamp and control lamp will only appear on display, if under additional module ⊙ courtyard/control lamp is selected.

tousek DIGITAL

ESC ENTER

Warning

- **Before taking off the control cover, the main switch must be turned off !**
- **If an emergency battery is connected, also disconnect this battery!**
- **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 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 dead man's operation (=hold to run) is chosen, the radio receiver is 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 (see page 22), if desired.

Push buttons, key switches or external radio receivers with potential-free make 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 impulse switch – closing the gate with the impulse switch is not possible.

○ **DEADMAN:** 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.
As soon as the deadman function is activated, the radio receiver is without function (due to safety reasons).

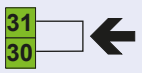
The DEADMAN function can not be chosen actively but is set automatically as soon as the impulse button is set to DEADMAN mode.

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

STOP-switch (terminals 30/31)

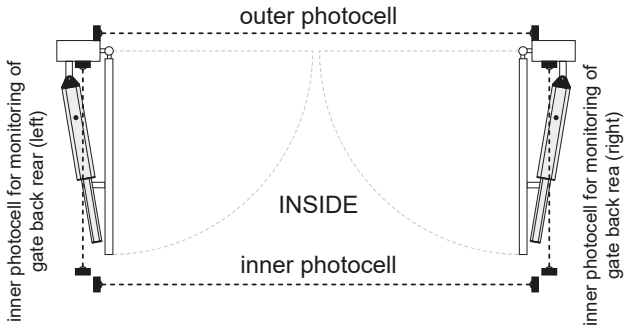
- when pressing the stop switch the gate stops in any desired position.

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

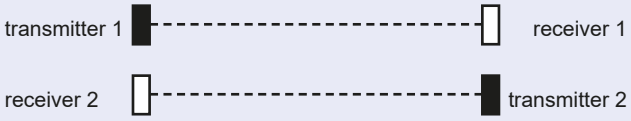


- *Energy saving mode:* photocell transmitter is turned off when gate is closed
- With **additional inner photocells** the back area of the gate can be monitored. (All inner photocells are then set in series at control terminals 45/46 (terminals for inner photocells)).
- The exact function of the photocells depends on the programming of the control unit:
  Photocell functions *see page 13.*

Important: notes for photocells

- **The control unit has a power supply connection for 12V DC photocells (LS):**
  Power supply LS-transmitter: terminals 41(-) / 42(+), Versorgung LS-receiver: terminals 43(-) / 44(+)
  Hinweis: Kl. 41/42 werden in der „Tor geschlossen"- Stellung in den Stromsparmodus (d.h. spannungsfrei) geschalten.
- **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:



- **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.

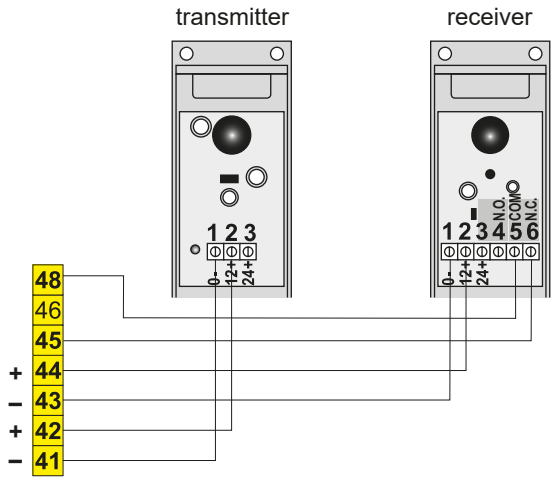
G **Outer photocell** (contact: terminals 45/48)

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

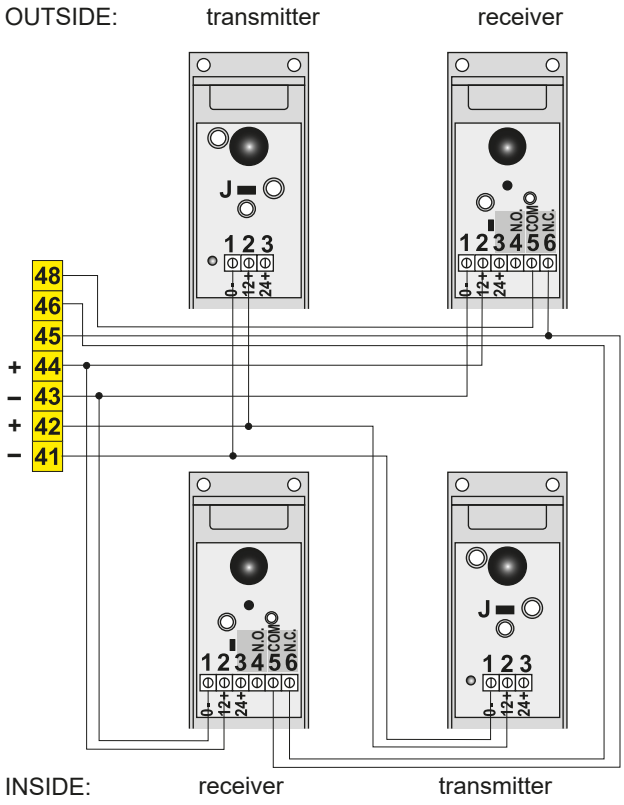
○ **not active:** to be selected, if outer photocell should not be triggered.

Photocells - connection examples

Outer photocell
Tousek LS 41 as safety device

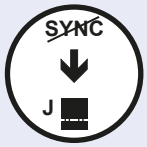


Outer and inner photocell
Tousek LS 41 as safety device

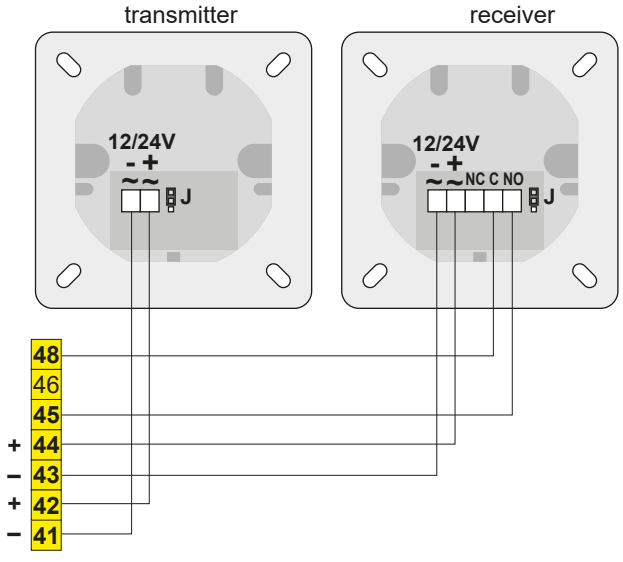


Deactivation of SYNC-Function

- The SYNC-Function of LS41 is **not possible** with this control board. For deactivation the jumpers **have to be placed in both LS-transmitters** *(pict. right). see also manual of LS 41.*



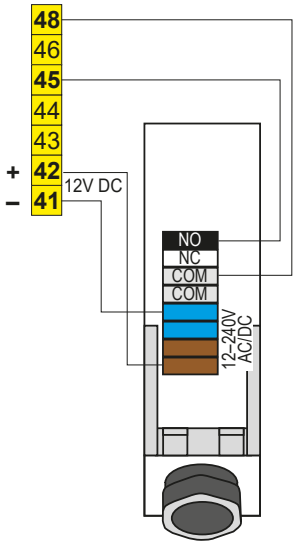
Outer photocell
Tousek LS 26 as safety device



Important

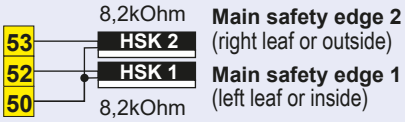
- **Jumper J of transmitter and receiver has to be adjusted in the same way.**

Outer reflective photocell
Tousek RLS 620
as safety device



Safety sensing edges (main closing edge 1 + 2)

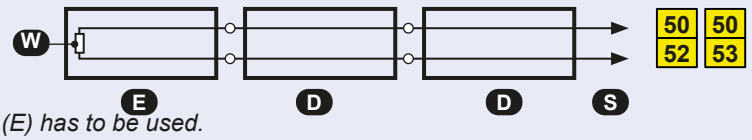
- **OBSTACLE DETECTION:** when a contact strip/safety edge is triggered/activated then a change of direction is effected for 1 second. Then the gate stops.
- The activation of the safety sensing edges is made in menu **„Safety / main closing edge 1“** (term. 50/52) and **„Safety / main closing edge 2“** (term. 50/53)
- If in the menu item **„operating logic / closing edge“** (see page 16,17) one of the modes **„left / right“** or **„inside / outside“** is selected - consequently there is the wiring of the contact strips 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

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.

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 photocell during pause time shortens the pause time. After release of the photocell the gate starts closing.
- ○ **re-start of 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 photocell is interrupted during the opening movement, the gate starts closing as soon as it reached end position open after 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

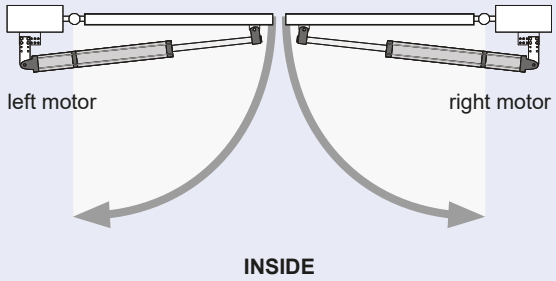
- **The photocell self-test can only be deactivated by selecting „not active".**
- **The deactivation of the self-test function is only permitted if the safety installations correspond to the category 3 !**

Important: notes for connection and adjustment of operators

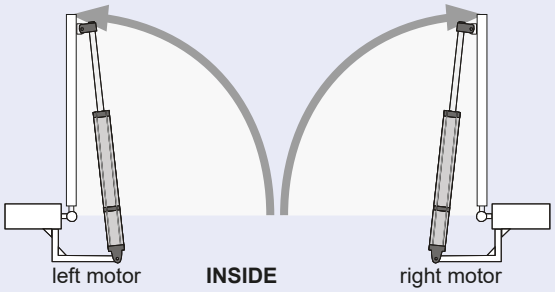
- It is possible to connect **2 motors 12V DC, max. 60 W** to the control board ST 12/5.
  Motor left: terminals 20/21 / Motor right: terminals 24/25
- **Attention: Before carrying out any installation and connection works, the power supply of the gate facility has to be turned off!**
- **Connection: When connecting the operators to the control unit, always pay attention to the door situation, ie whether the door opens inwards or outwards (= special case). The drive connection** *(see table)* **and the function of the limit switches** *(see operator manual)* **are dependent on this.**

Door situation		*) opening inwards		special case: opening outwards	
Motor		LEFT	RIGHT	LEFT	RIGHT
blue cable	to terminal:	20	24	21	25
brown cable	to terminal:	21	25	20	24

*) opening inwards



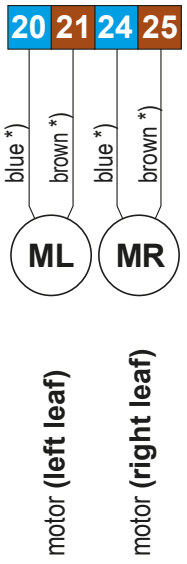
special case: opening outwards



- **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.**
- **OBSTACLE DETECTION:** If a gate wing runs into an obstacle a change of direction is effected for 1 second. Then the gate stops.

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** *(see page 8)* **!**



motor left (terminals 20/21)

⊙ **motor ON**

○ **motor OFF**

left motor

INSIDE

Important

- **the adjustment has to match the actual situation of the motor connection !**

G delay left leaf

⊙ **opening delay:** The leaf opens against the right one only after a set delay time.

○ **closing delay:** The leaf closes against the right one only after a set delay time.

G delay time left ⊙ 2s (factory setting)

○ **0–25s delay time adjustable:** defines the delay during opening or closing.

ARS response time ⊙ 0,70s (factory setting)

○ **0,15–0,95s ARS response time adjustable:** defines, in what time the AR-system responds. The lower the value the more sensitive the system is set.

max. force ⊙ 70% (factory setting)

○ **30–100% adjustable:** determines the motor force

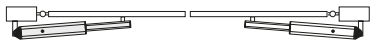
soft stop time ⊙ 5s (factory setting)

○ **0–25s adjustable:** defines the duration of soft stop phase.

motor right (terminals 24/25)

⊙ **motor ON**

○ **motor OFF**



right motor

INSIDE

Important

- **the adjustment has to match the actual situation of the motor connection !**

G delay right leaf

○ **opening delay:** The leaf opens against the left one only after a set delay time.

⊙ **closing delay:** The leaf closes against the left one only after a set delay time..

G delay time right ⊙ 2s (factory setting)

○ **0–25s delay time adjustable:** defines the delay during opening or closing.

ARS response time ⊙ 0,70s (factory setting)

○ **0,15–0,95s ARS response time adjustable:** defines, in what time the AR-system responds. The lower the value the more sensitive the system is set.

max. force ⊙ 70% (factory setting)

○ **30–100% adjustable:** determines the motor force

soft stop time ⊙ 5s (factory setting)

○ **0–25s adjustable:** defines the duration of soft stop phase.

Impulse logic

⊙ **stop, start of pause time:** a command of the impulse switch during the opening 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

⊙ **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)

○ **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.

Automatic mode

⊙ **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

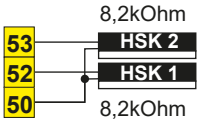
⊙ **no influence**

○ **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.

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**. .

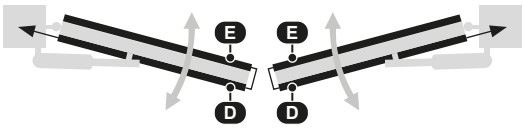
○ **inside/outside:**
Contact edges that should react on an obstacle at the **inside of** the leaf **during opening**, must be connected (serial) on the terminals of the **main safety edge 1: term. 50/52**.
Contact edges that should react on an obstacle at the **outside of** the leaf **during closing**,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

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

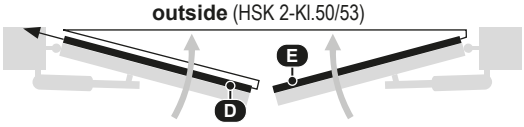
Assignment \ movement			opening	closing
HSK 1	*mode left/right*	**left**	active	active
HSK 2		**right**	active	active
HSK 1	*Modus inside/outside*	**inside**	active	
HSK 2		**outside**		active

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

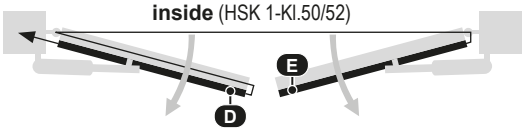
left (HSK 1 - Kl.50/52) **right** (HSK 2 - Kl.50/53)



outside (HSK 2-Kl.50/53)



inside (HSK 1-Kl.50/52)



Prewarning OPEN (terminals 10/11)

⊙ **switched off**

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

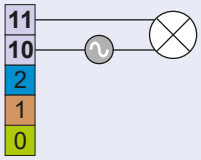
Prewarning CLOSE (terminals 10/11)

⊙ **switched 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** *(see page 8)* **!**

The following two menu points can only be selected if the menu point additional menu is adjusted to „Courtyard-/Control lamp“ (hence shown on display).

Courtyard lamp (*Description add. modules page 19*)

⊙ **switched off**

○ **5–950 adjustable:** at the courtyard lamp output an external lamp can be connected (e.g. garden lamp), which can be turned on for each opening command for the duration of adjusted time.

Control lamp (*Description add. modules page 19*)

⊙ **illuminates during open and close:** The pilot lamp output is activated during opening- and closing movement.

○ **blinks slowly/illuminates/blinks:** The pilot lamp output is activated as follows: During opening the pilot lamp flashes slowly. During pause time, in opened position or when the gate stops it is illuminated. During the closing movement it flashes rapidly. If the gate is closed, the pilot lamp expires

○ **illuminates in open position:** Pilot lamp is illuminated as soon as the gate has reached end position open.

Warning

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

Electric lock (terminals 72/73)

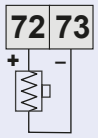
⊙ **switched off**

○ **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

Electric lock

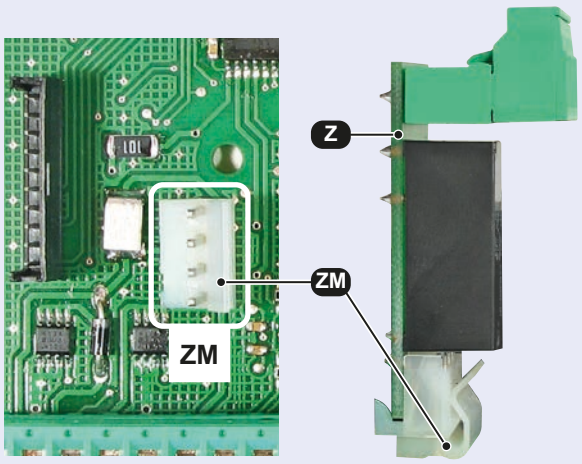
- To terminals 72/73, an e-lock 12V DC, max. 15W can be connected.
- **Only electric locks that are designed for 12V DC, can be connected.**

12V DC, max. 15W



Additional module
Courtyard lamp/control lamp hence gate status display

- The use of one of the addtional modules is optional.
- Depending on which device, e.g. a courtyard-/Control lamp is chosen or evaluation of gate status should be effected, the corresponding module has to be plugged to the according slot/plug of control board.
- Additionally the corresponding value has to be selected in menu point „Additional module“.

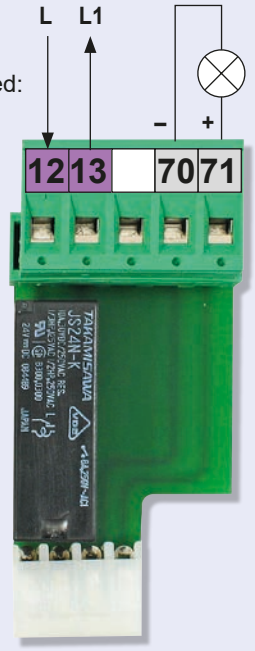


Connecting an additional module

- turn off power supply !!
- Plug additional module **(Z)** through opening onto the slot **(ZM)**.

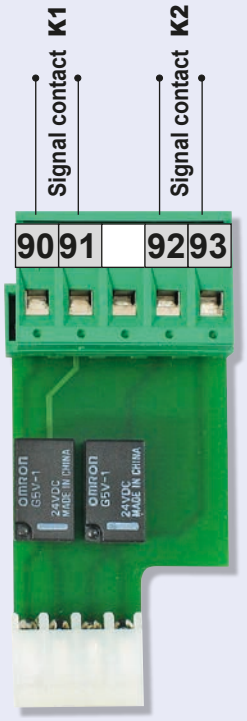
Additional module Courtyard lamp/Control lamp

- On the terminals 12/13 a courtyard lamp can be connected: **230V, max. 100W**
- On the terminals 70/71 a control lamp can be connected: **12V d.c., max. 2W**



Additional module Gate status display

- with potential free signal contacts K1 (Kl. 90/91) and K2 (Kl. 92/93) the gate staturs can be evaluated in two ways *(see menu point „Additional module“)*.
- Contact load: **24V a.c./d.c., max. 10W**



Additional module

Peripherals

⊙ **Courtyard lamp/control lamp:** the menu points courtyard lamp and control lamp are ready for adjustment a(that means if not selected, these menu points will not be shown on the display)

○ **status display 1:** with the two potential-free signal contacts K1 and K2, the gate end positions (limits) can be evaluated.

○ **status display 2:** with the two potential-free signal contacts K1 and K2, the gate end positions (limits) as well as direction of gate movement can be evaluated.

		function	K1	K2
gate status display	1	gate in CLOSE-position	1	0
		gate in OPEN-position	0	1
	2	gate in CLOSE-position	1	1
		gate opens, or has been stopped	1	0
		gate closes, or has been stopped	0	1
		gate in OPEN-position	0	0

0 = Signal contact open, 1= Signal contact closed

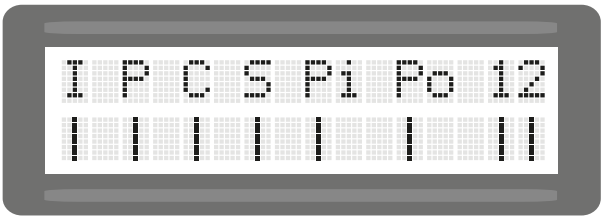
Requirement for the realization of one of the selected options (courtyard-/control lamp or door status 1 or 2, is the presence of the corresponding supplementary module.

Status display

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

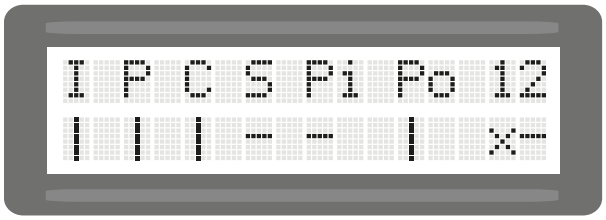
I	impulse switch
P	partial opening switch
C	CLOSE-switch
S	STOP-switch
Pi	photocell inside
Po	photocell outside
1	safety edge main closing edge 1
2	safety edge main closing edge 2

¦	Status: not triggered
¦	Status: triggered
X	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.

Delete position

⊙ **NO:** does not delete the end positions “gate closed” and “gate open”

○ **YES:** the determined end positions are beeing deleted.
Note: the end positions will be determined after new impulse.

The mechanical stops have to be placed so that possibly existing safety contact edges can not be triggered, as this would lead to an error message.

factory setting

⊙ **NO:** no reset back to factory settings

○ **YES:** reset back to factory settings

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

Software version

➲ **shows the software version on display**

Serial number

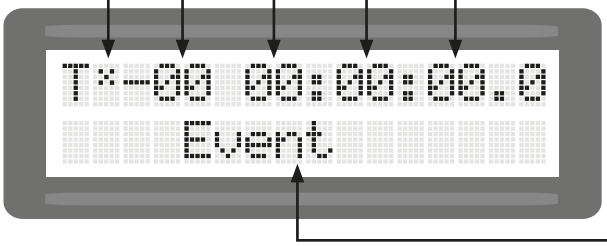
➲ **shows the serial number on the display screen**

Protocol

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

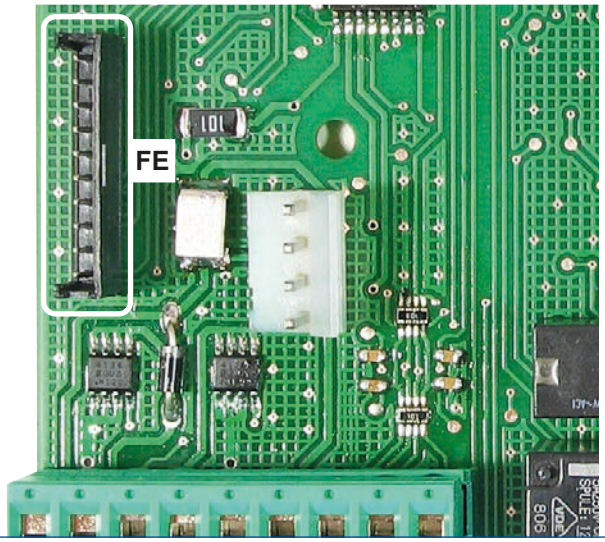
With * the protocole beginning hence the end is shown

Time since the last event:
DAYS HOURS : MINUTES : SECONDS



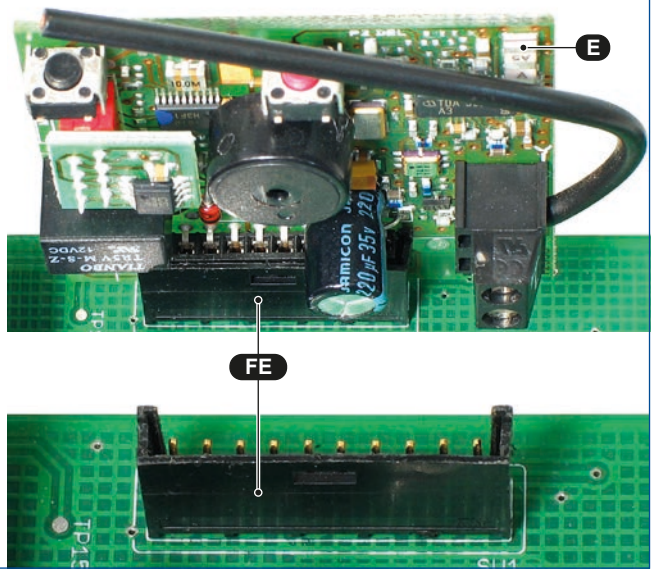
Type of event

- **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.***

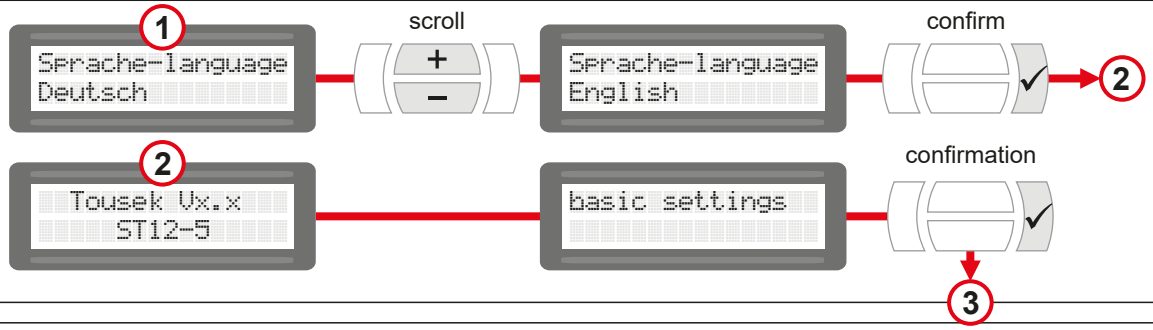


Important: preparation works

- 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..

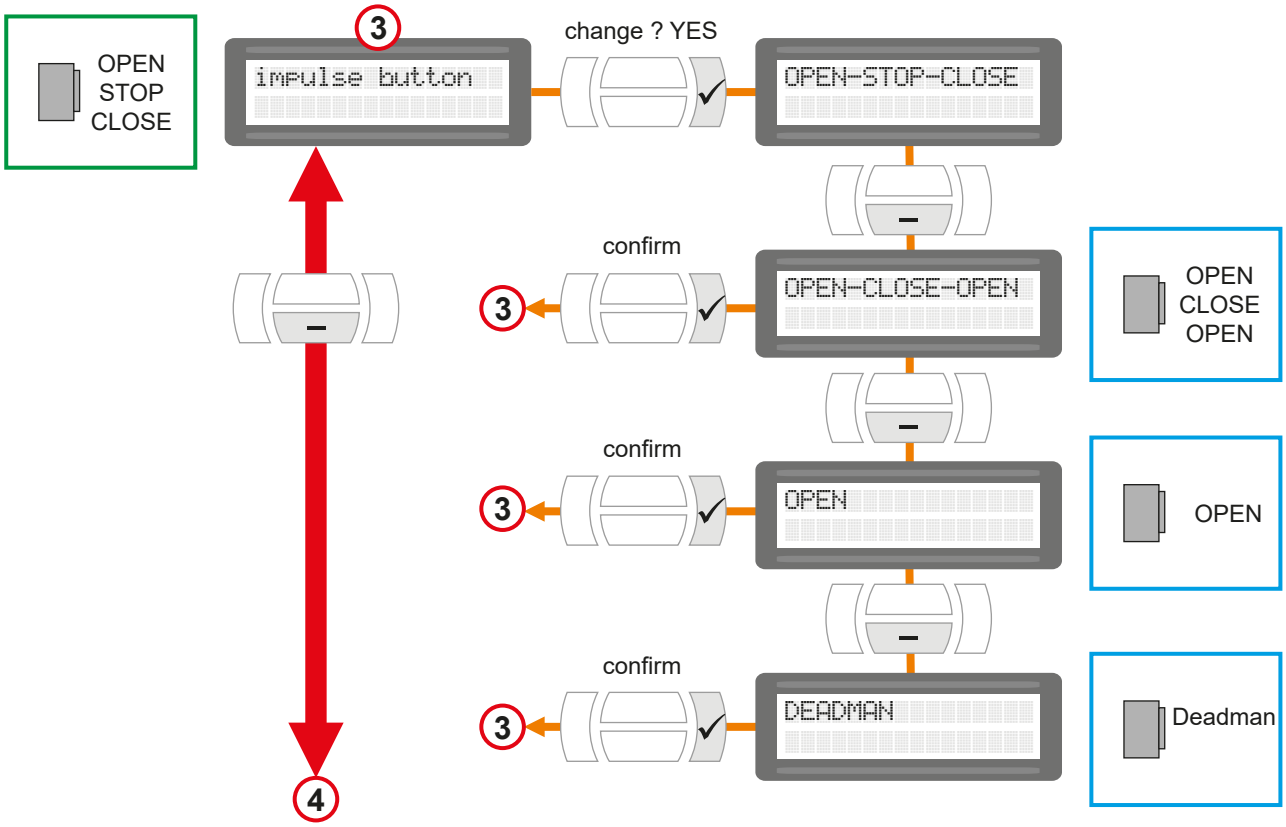
LANGUAGE SELECTION

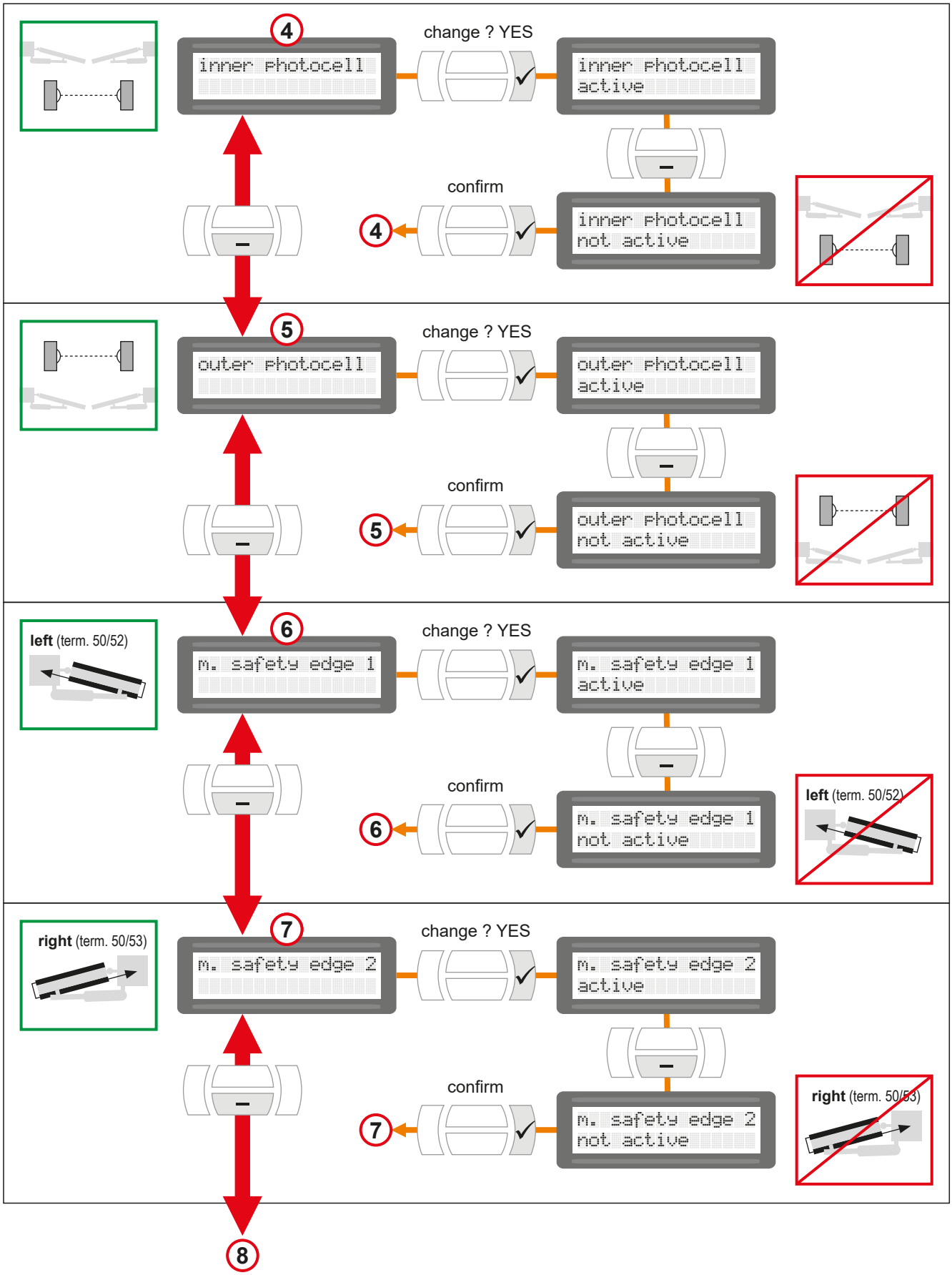
- **Can be selected during initial operation (hence after reset to factory settings).**
- **Can be also chosen by pressing the ESC button ( ) for 5s, from any position in menu.**

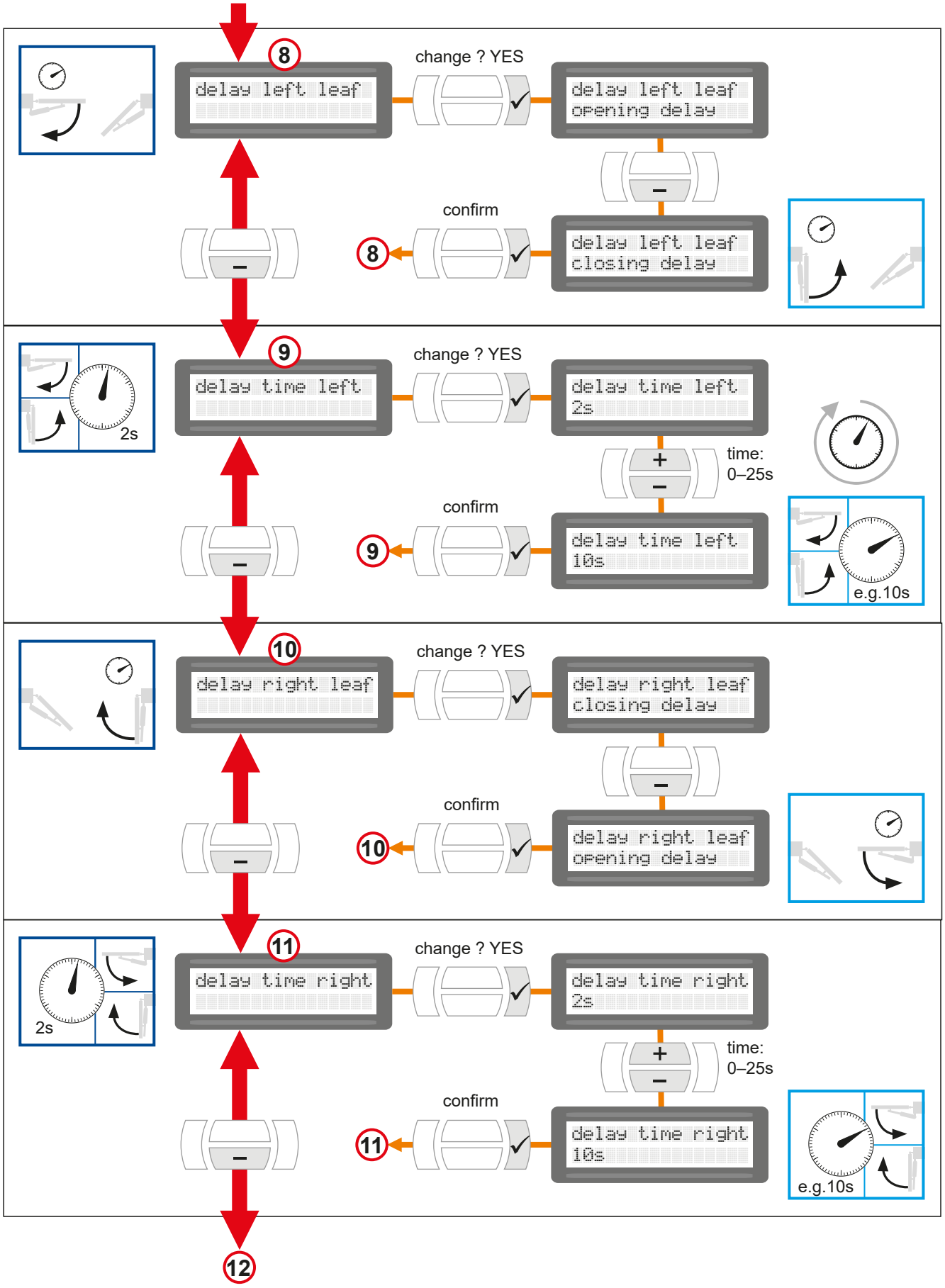


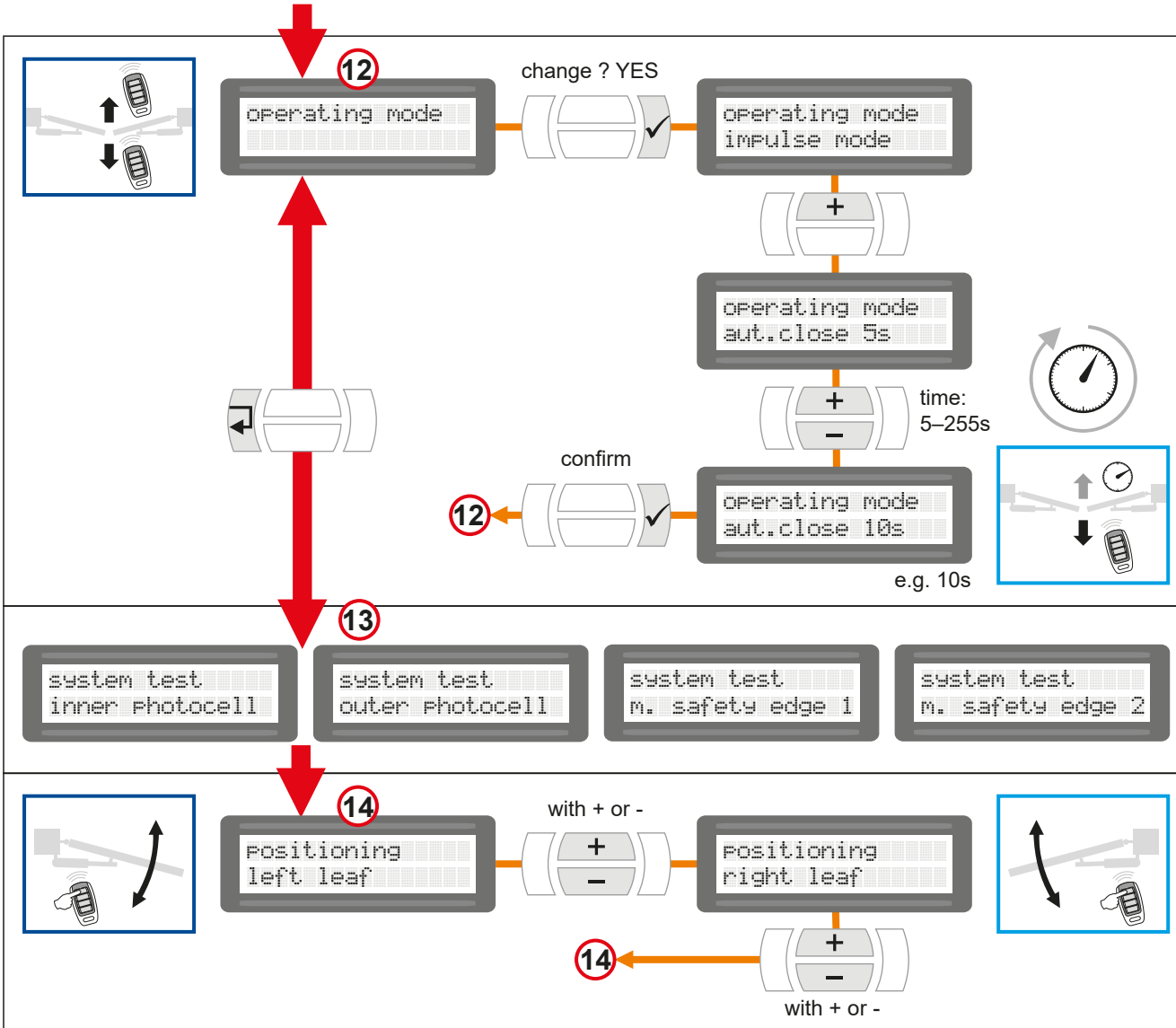
BASIC SETTINGS

- **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** *(siehe menu page 7).*
- **The next programming adjustments are made in the main settings menu** *(see page 6–7).*

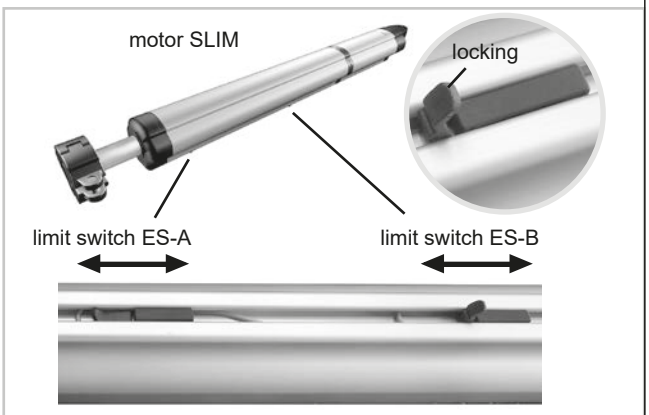



4
inner photocell
change ? YES
inner photocell
active
confirm
4
inner photocell
not active
5
outer photocell
change ? YES
outer photocell
active
confirm
5
outer photocell
not active
left (term. 50/52)
6
m. safety edge 1
change ? YES
m. safety edge 1
active
confirm
6
m. safety edge 1
not active
left (term. 50/52)
right (term. 50/53)
7
m. safety edge 2
change ? YES
m. safety edge 2
active
confirm
7
m. safety edge 2
not active
right (term. 50/53)
8


8
delay left leaf
change ? YES
delay left leaf
opening delay
confirm
8
delay left leaf
closing delay
9
delay time left
change ? YES
delay time left
2s
2s
time:
0–25s
confirm
9
delay time left
10s
e.g.10s
10
delay right leaf
change ? YES
delay right leaf
closing delay
confirm
10
delay right leaf
opening delay
11
delay time right
change ? YES
delay time right
2s
2s
time:
0–25s
confirm
11
delay time right
10s
e.g.10s
12



- Each press on the **+ or - button or the pedestrian button** switches now between **“positioning left leaf”** and **“positioning right leaf”** .
- Now the adjustement of the gate end positions is mader through the limit switeches on motor (by moving). By pulsing (eg impulse button) the previously selected drive (left or right) will first perform an closing movement. Every further impulse now, the drive movement can be stopped or reversed alternately.
  The movement of motor stops at the latest when reaching the respective limit switch. However if the gate leaf runs before into a limit stop on the ground, tso it may happen that due to the max. Engine power to control the drive motion shortly thereafter repents and stops (obstacle detection). To avoid this, the limit switches have to be adjusted be adjusted so that, although the shutdown takes place before the detection of obstacles, but not so early that the gate is still not pressed close enough (for a fixed lock) against the bottom stop.



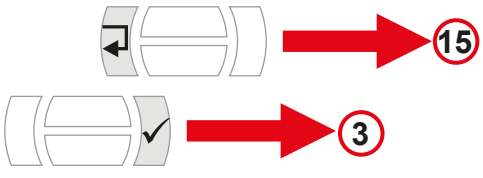
SLIM SLR, -CLR: internal limit switches

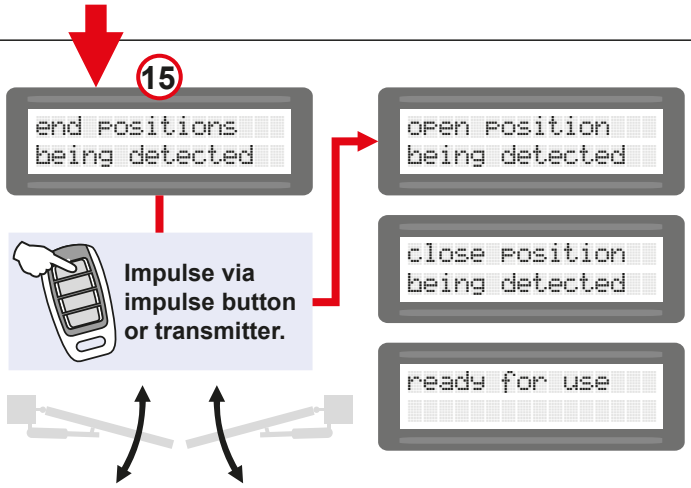
Door situation	opening inwards	opening outwards
limit switch	for gate end position	
ES-A	CLOSED	OPEN
ES-B	OPEN	CLOSED

- After adjusting the limit switches, the next steps are

  with **ESC-button** the detection of end positions

  with **ENTER-button** the return of basic settings





- The end positions (limits) are being automatically detected as follows:
  - The leaf with closing delay (and then the one with opening delay) detects the open position (i.e. drives to end position open)

In case that the leaf closes, the polarity of the motor cables has to be reversed.

  - The leaf with opening delay (and then the one with closing delay) detects the closed position (i.e. drives to end position open)

Note: Avoid sending commands by key switch or radio transmitter and don't trigger any of the safety devices during this procedure, since this would interrupt detecting the end positions.

- If the detection of the end positions is interrupted by a mistake, giving an impulse or triggering a safety device, another impulse has to be given to continue with the procedure and execute the control cycle to detect again the end positions automatically.

  Appearing problems have to be solved at first (eg. "error max. force" requires a correction of the set motor force). As soon as the control cycle has been carried out, the facility is ready for operation.

- **Note If the end positions are detected improperly, the values have to be deleted before reprogramming in menu point "MENU/RESET/DIAGNOSIS/POSITIONS NEW (=YES).**
- **Note: After each power failure only the open positions are newly detected.**

6.1 Connection of the backup (emergency) battery (optional) swing gate control ST 12/5

- The optional back-up battery can be housed in the control housing of the ST 12/5, and enables the opening and closing of the gate in case of power failure.
- For optional emergency battery you also need a charger board. This is plugged with FASTON terminals to the controller and loads the emergency battery during normal operation.

Technical data

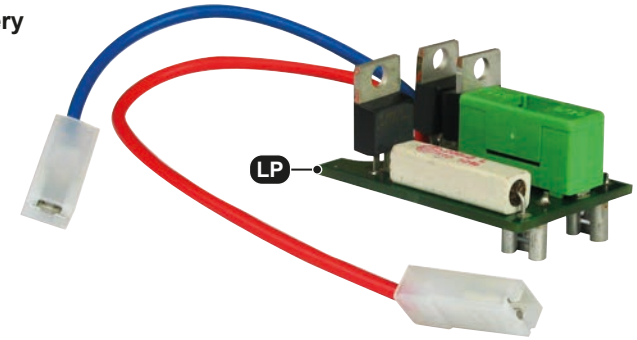
Backup battery	
Amount of cycles	approx. 20 cycles
Emergency time	approx. 12 h
Fuse	10 A T

- With the battery (12V / 2.1 Ah) battery reaches a full charge for about 20 cycles. It should be noted however, that the connected devices, such as photocell, radio receiver consume electricity during power failure continues, so, depending on the connected devices after 12 hours, the emergency battery can be drained.

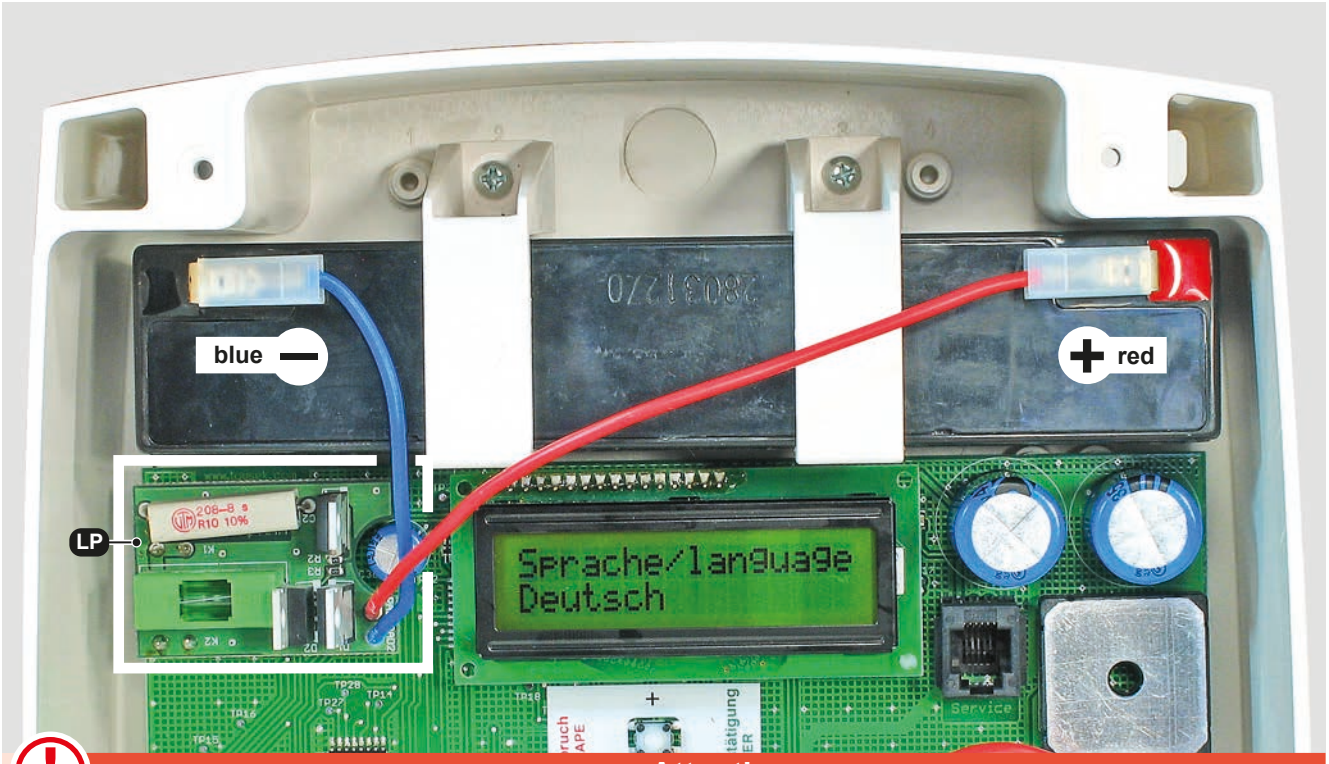
Connection of the backup emergency battery

- For operation with the optionally available emergency battery **an additional loading print board (LP)** is necessary**.** This print has to be connected between control board and battery.
- Set loading printed circuit board on FAST ON terminals of control *(as shown in the picture)*.
- Install emergeny battery in control housing *as shown in the picture.*
- **At connecting the loading print with the emergency battery please pay attention to the correct polarity:**

ATTENTION: Wrong connection leads to destruction of emergency battery and control unit!



- Connect **red cable** of print with **+ pole** of emergency battery (marked red)!
- Connect **blue cable** of print with **– pole** of emergency battery (marked blue)!



Attention

- **Take care of the correct polarity!**
- **Wrong connection leads to destruction of emergency battery and control unit.**
- **Connect red cable of loading print with plus pole (marked red) and blue cable of print with negative pole (marked blue)!**
- **Used batteries may not be disposed of in the usual household waste, but have to be brought to a collecting point.**

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	under voltage	call service technician

8. Dimensioned drawing housing IP54

- dimensions in mm

- Mounting dimensions (back side)

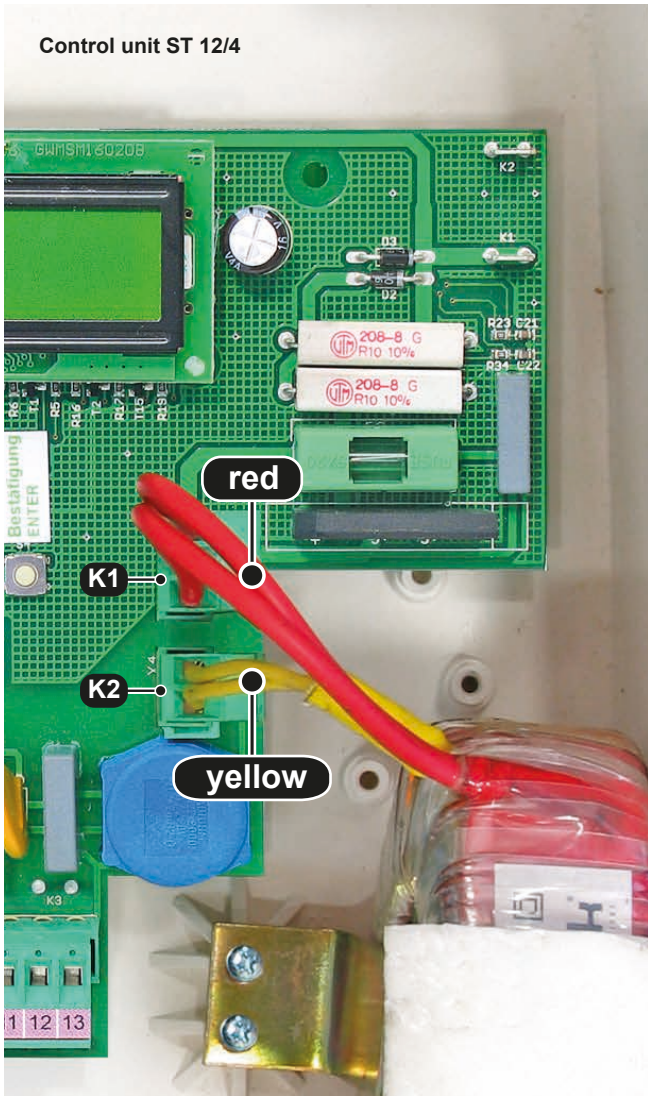
We reserve the right to change dimensions and technical specifications without prior notice !

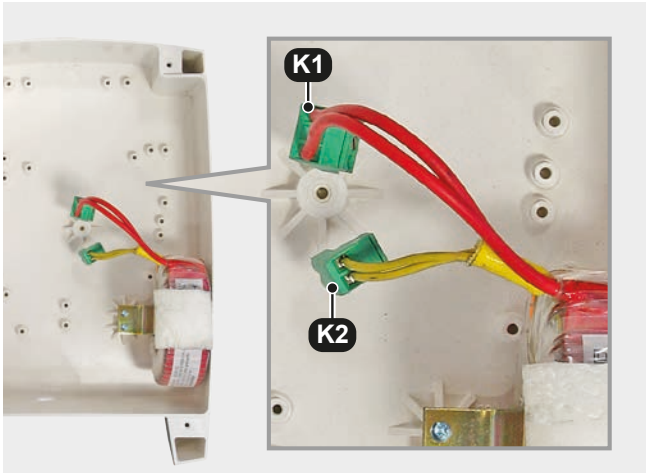
- The conversion of the old control unit ST 12/4 to the new model ST 12/5 is possible by simply replacing the control board while maintaining the existing control box and transformer.

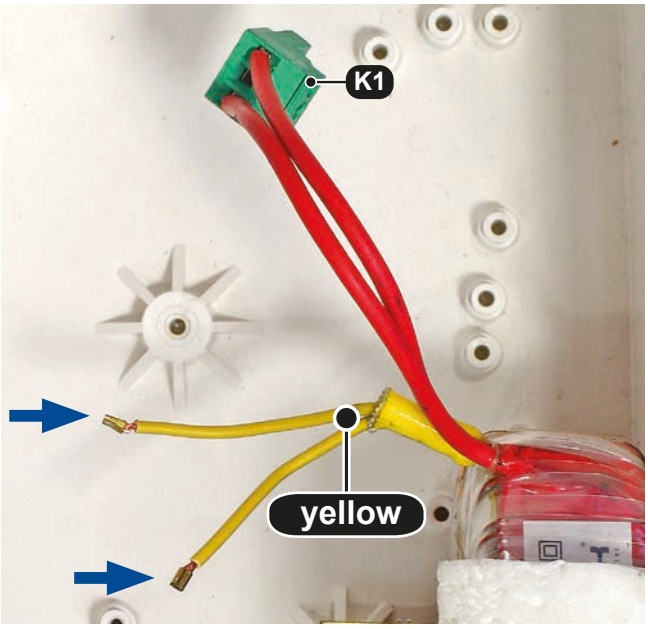
Warning

- **Before taking off the control cover, the main switch must be turned off !**
- **If an emergency battery is connected, also disconnect this battery!**
- **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 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).**

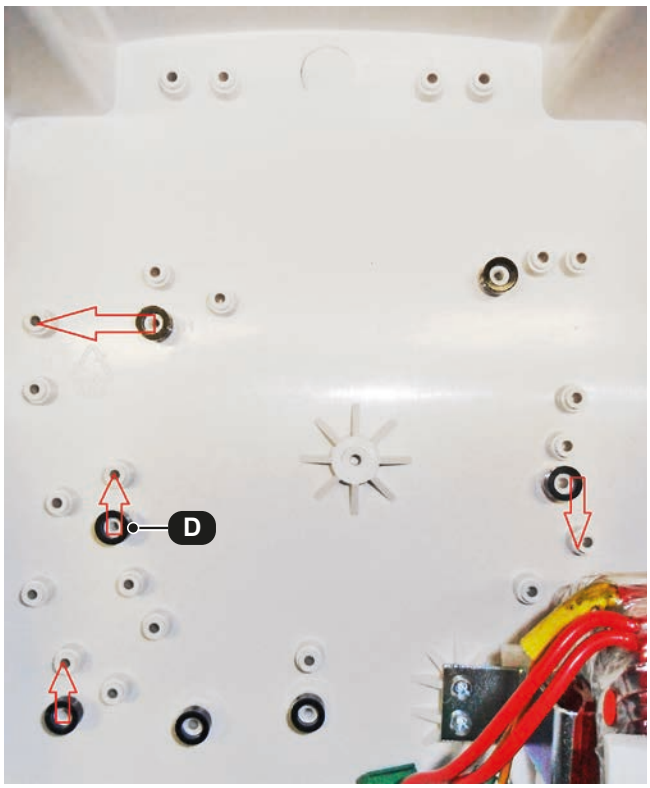
- After separation of the system (control) from the power supply, open the case and pull off both control terminals **(K1, K2)**, which lead from the transformer to control board (**K1: red line transformer, K2: yellow transformer wire**).
- Loosen the screws with which the control board is connected to the chassis and remove the board.
- By loosening the screw terminal remove the two yellow wires **(primary line)** from the terminal block **(K2).**

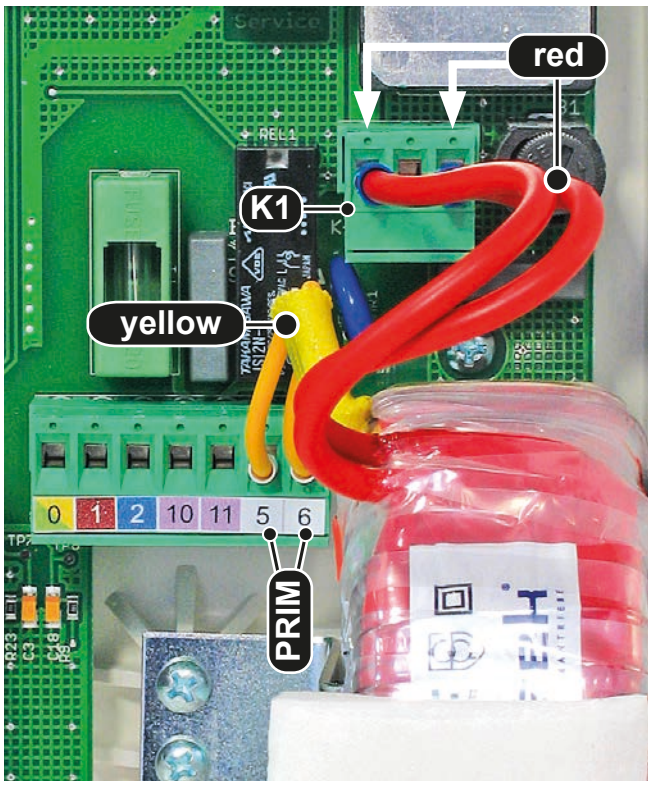






- Now implement the spacers (D) according to the lower diagram, fit the new control board ST12/5 and fix it with screws into the existing housing**.**
- The transformer leads are connected as follows:
  - The 3-pin terminal block **(K1)**, where the red wires are clamped, insert it into the slot as shown below.
  - The primary line (yellow wire) must be connected to terminals **5/6 (PRIM)** of the control board ST 12/5.





Control unit ST 12/5

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