






Mounting and installation manual

Sliding gate operators PULL T5, -T8, -T10



	General warning and safety details	3
1.	Notes, general characteristics, function, technical data	4
2.	Mounting	5
	Technical layout PULL T5, -T8, -T10, general mounting notes, warning note	5
2.1	Mounting of the motor	6
2.2	Mounting of the gear rack	7
2.3	Dismantling	7
3.	Control unit, overview	8
	Warnings - connection works	9
3.1	Clamp/terminal assignment	9
3.2	Adjustments - overview,	10
	Programming keys, program menu, basic settings	10
	Structure of the menu	11
3.3	Connections and adjustments	12
	Switches/buttons	12
	Impulse switch (terminals 30/32)	12
	Pedestrian switch (terminals 30/34)	13
	CLOSE switch (terminals 30/33)	13
	STOP switch (terminals 31/37)	13
	Safety	14
	Photocell (Contact: terminals 45/46)	14
	<i>Photocells - connection examples</i>	14
	<i>Information for safety edges</i>	16
	Main safety sensing edge (terminals 50/52)	16
	Side safety sensing edge (terminals 50/51)	16
	Photocell function	17
	Photocell with pause time	17
	Photocell test	17
	Motor	18
	max. force	18
	ARS response time	18
	Speed	18
	Soft stop way	18
	Soft stop speed	18
	End position OPEN, end position CLOSE	18
	Operating logic	19
	Impulse button	19
	Opening direction	19
	Operating mode	19
	Partial opening	19
	Automatic mode	19
	Pause time logic	19
	Lamps / Lights	20
	Prewarning OPEN (signal lamp: terminals 10/11)	20
	Prewarning CLOSE (signal lamp: terminals 10/11)	20
	Additional module	20
	Courtyard lamp	20
	Control lamp	20
	<i>Description of add. modules courtyard lamp/control lamp hence gate status display</i>	21
	Diagnosis	22
	Status display	22
	Delete end positions	22
	Factory setting	22
	Software version	22
	Serial number	22
	Protocoll	22
	Status Sensor	22
4.	Emergency release in case of power failure (note for the user)	23
5.	Change of euro standard cylinder	23
6.	Connection of radio receiver	24
7.	Initial operation	26, 27
8.	Error diagnosis	28
9.	Cable plan	29
10.	Dimensioned drawing	30
	Declaration of incorporation	31



GENERAL WARNING AND SAFETY NOTES

- These installation and operating instructions form an integral part of the product “sliding gate operator”. 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. They describe the proper installation and operation of the sliding gate operator 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 at the gate-system, the power supply has to be turned off.
- 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. cannot 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.
- The electric motor heats up during operation. Therefore the device should only be touched after it has cooled off.
- 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.
- **Please notice that the warranty will not be applicable if the label with the engine number has been removed or damaged.**



Maintenance

- **Maintenance works may only be carried out by qualified personnel.**
- **Check the proper sensitivity setting of the ARS safety reverse system once a month.**
- **Check the proper function of the emergency release mechanism periodically.**
- **Check if all mounting screws are securely fastened periodically.**
- **Remove dirt deposits from the operator and gear rack periodically.**
- **Maintenance and servicing of the complete gate facility has to be carried out according to the gate builder’s/ installer’s instructions.**

Characteristics PULL T5, -T8, -T10

- Programmable control panel accessible from exterior with illuminated display in english
- Direct connection of 8,2 kOhm contact barriers (safety sensing edges (2-channels))
- Three operating modes (impulse, automatic and dead man)
- Adjustable partial opening
- Built in control board in separate housing
- Safety system ARS (automatic reversal system)
- Self locking worm gear
- Emergency release, lockable with profile half cylinder
- Self learning end positions (limits)
- Drive unit (gearbox unit) made of steel and runs in an oil bath
- Permanently selflearning force
- Adjustable soft stop (no loss of force even with reduced revolution speed)
- worm gear and worm wheel made of tempered steel



Characteristics PULL T5

Characteristics PULL T8

Characteristics PULL T10

- Up to 500kg and 20 cycles/day

- up to 800kg and 40% duty cycle

- up to 1000kg and 40–60% duty cycle

General

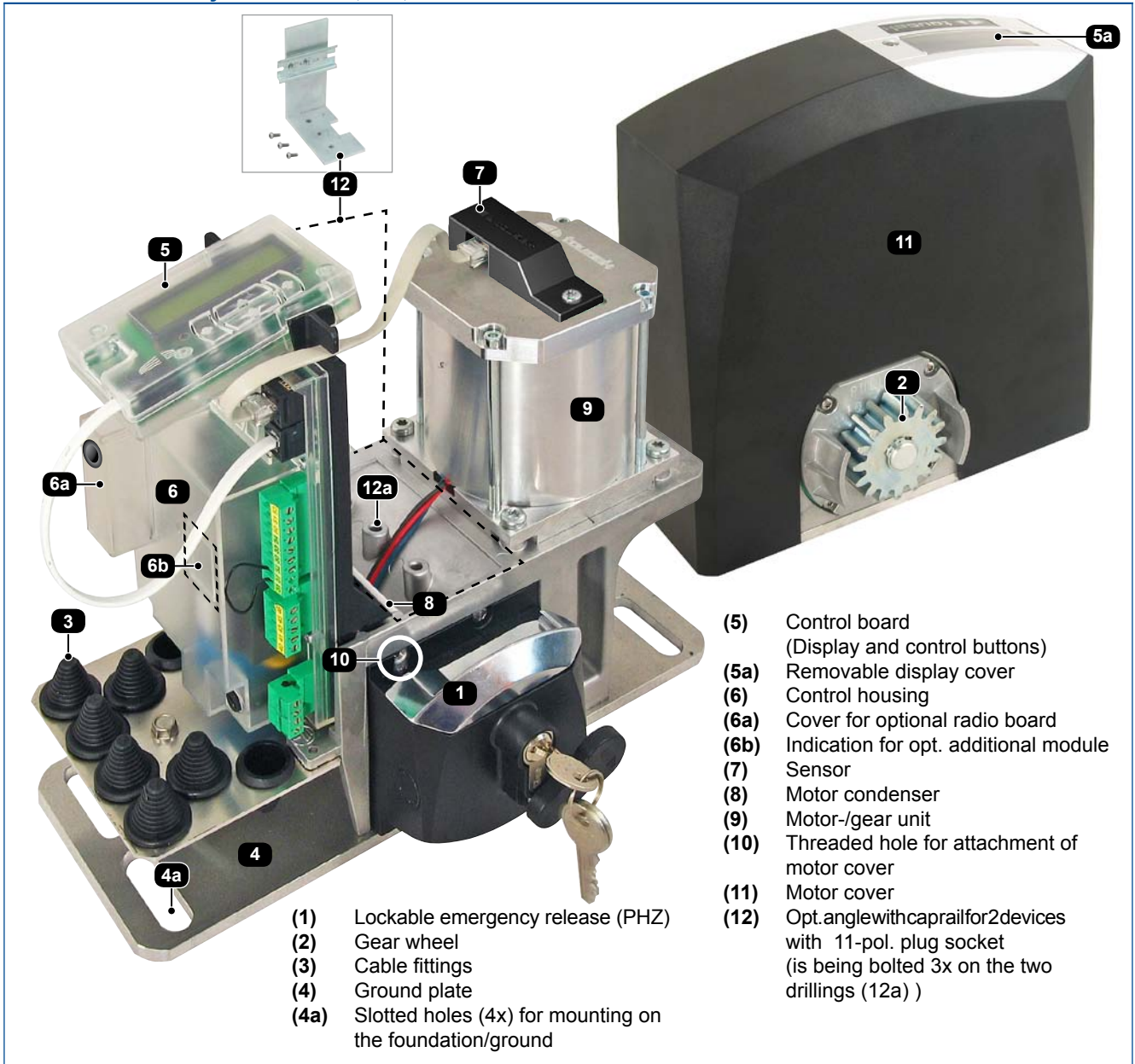
During the development of the new operator generation Tousek PULL T5, -T8, -T10 special attention has been paid to a quick and simple installation and a troublefree operation, together with the proven quality and reliability. Accordingly, many clever details have been built into the operator - from the automatic learning of gate end positions, to the control board with removable clamps an integrated safety sensing edge analysis, to an easy programmable text display - which make it particularly user-friendly. The drive unit itself consists of an electric motor and a worm gearing, accommodated in a robust aluminium housing, and - together with the integrated microprocessor control unit and the safety reverse system ARS - forms a compact device with small overall dimensions.

The safety reverse system ARS senses obstacles during opening and closing of the gate and permits a continuous adjustment of the drive force. Following the Tousek tradition, all operator components have been built in a particularly robust and resistant way to guarantee the safe and reliable operation even in the most adverse weather conditions. Additional improvements are for example: control board with display is accesible from outside, the separate control board housing, which double protects this sensible part, or an oil bath which ensures that the motor/gearing components can move in an optimal way in all temperatures with perfect lubrication and cooling effect. The installation of the PULL T5, -T8, -T10 is possible for new or already exsting sliding gates in a simple and fast way.

Technical data

Sliding gate operator PULL-	T5	T8	T10		T5	T8	T10
Control board	integrated			Max. drive	30m		
Power supply	230V a.c., 50Hz			duty cycle in S3 mode	20 cycles/day	40%	40–60%
max. current consumption (excl. equipment)	1,9A			Ambient temperature	-20°C +40°C		
Gear wheel	Z20M4		Z16M4	Protection class	IP44		
Max. gate weight	500kg	800kg	1000kg	Torque sensor	■	■	■
Speed	11m/min		9m/min	Article no.	11110370	11110380	11110390
Torque	20Nm	25Nm					
Optional equipment	pluggable receiver • additional module für courtyard/control lamp • additional module for gate status • bracket incl. top hat rail • radio transmission system TX 310 • inductive system TX 400i						

Technical layout PULL T5, -T8, -T10



General installation notes

Before installing the Tousek PULL T5, -T8, -T10 sliding gate operator we recommend checking the following points:

• **Checking the gate structure:**

On a gate which travels on floor rails please check the bottom rollers and the upper guide rollers and make sure that there is no undue friction or jamming.

On a cantilever gate please check if the gate can be moved out of its end-positions without undue effort.

- The gate must travel in a stable manner without lateral movements of the gate panel.
- Make sure that the gate travels in a regular way without undue friction or jamming along the whole travel length.
- **Make sure that there are stoppers at both ends of the track, preventing the gate from running over its travel limit.**



ATTENTION !

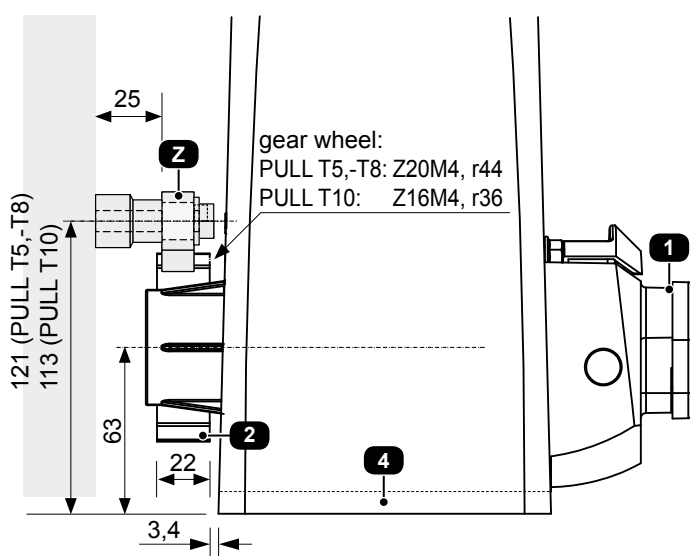
- **ATTENTION: Mechanical limits are necessary!**
- **ATTENTION: the sliding gate operator PULL T5, -T8, -T10 has been developed and designed for the automation of horizontally travelling sliding gates. Gates on sloping tracks (i.e. gates which follow an inclined, non-horizontal, travel path) must not be automated without additional safety devices (which make sure that the gate cannot start moving on its own from any gate position).**

After installing the protection tubes (**check cable exit of operator (3)**) and having finished the concrete foundation, the motor has to be bolted through the 4 slotted holes (**4a**) to the concrete foundation. It is particularly important that the operator is mounted parallel to the gate panel, and that the measurements given in the drawing are kept.

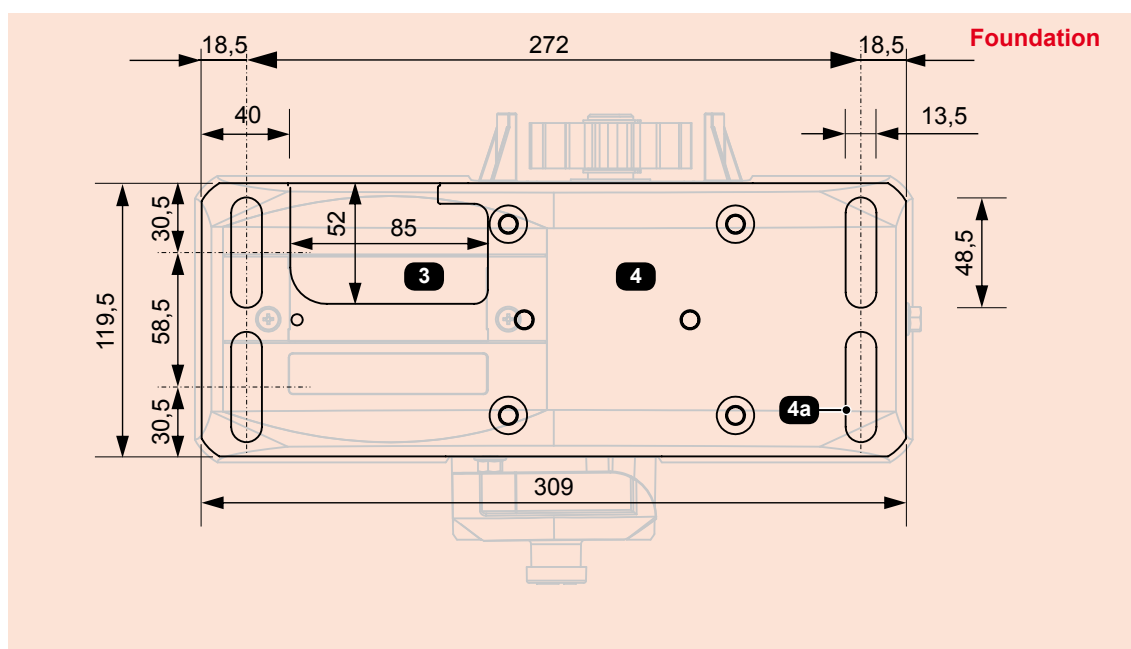


NOTE concerning cable laying

- The electric cables have to be laid in insulating sleeves which are suitable for underground usage. The insulating sleeves have to be lead into the inner of the operator housing (see picture).
- 230V cables and control lines have to be laid in separate sleeves.
- Only double-insulated cables, which are suitable for underground usage (e.g. E-YY-J) may be used.
- In case that special regulations require another type of cable, cables according to these regulations have to be used.



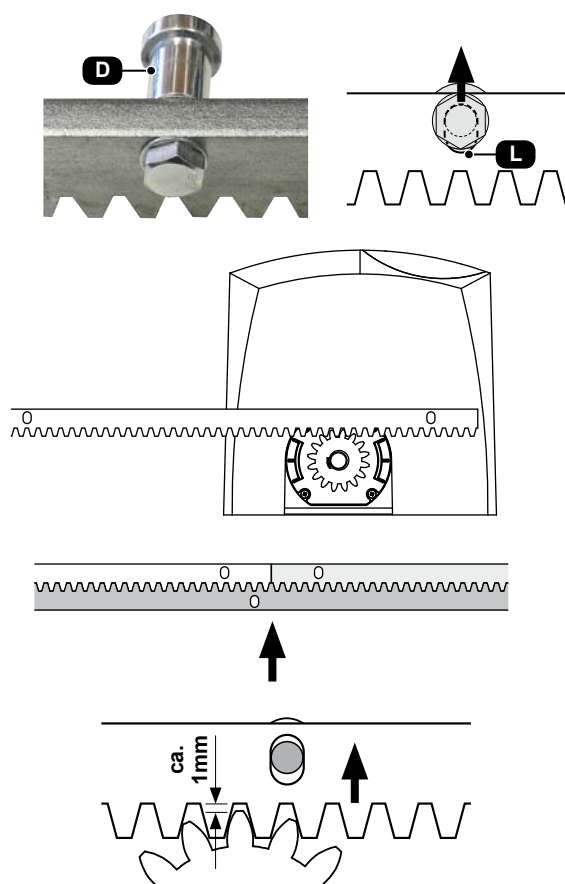
- (1) lockable emergency release (PHZ)
- (2) gear wheel
- (3) cable
- (4) ground plate
- (4a) slotted holes (4x) for connection on the ground
- (Z) steel gear rack



2.2 Installation of the gear rack

Installation

- Disengage the motor from the output drive pinion with the emergency release lever (see emergency release for instructions) and open the gate completely.
- Install the spacer tubes (D) with the help of the bolts and washers on the first meter of gear rack
- Make sure that the bolts/screws sit in the top end of the vertical slots (L), then tighten them.
- Place the first gear rack element on the drive pinion and fix it in place with a screw clamp.
- Move the gate by hand until reaching the end of the first gear rack element, then weld the first, second, and third spacer tube to the gate
- Proceed with the other gear rack elements in the same manner.
- **Before fixing the second meter of gear rack it is essential to place another gear rack element under the first and second gear rack elements, thereby making sure that the gearing module between the two gear rack elements will be exactly kept (see illustration).**
- After installation of the gear rack please loosen the fastening bolts slightly and rise the gear rack a little along the vertical slots, creating a **vertical distance of approx. 1 mm between the drive pinion of the operator and the gear rack.**
- The gear rack elements can also be installed without welding, i.e. by screwing them to the gate frame together with the spacer tubes. Apart from that the gear rack elements have to be installed in the same manner.



Attention

- **Do not weld the individual gear rack elements together!**

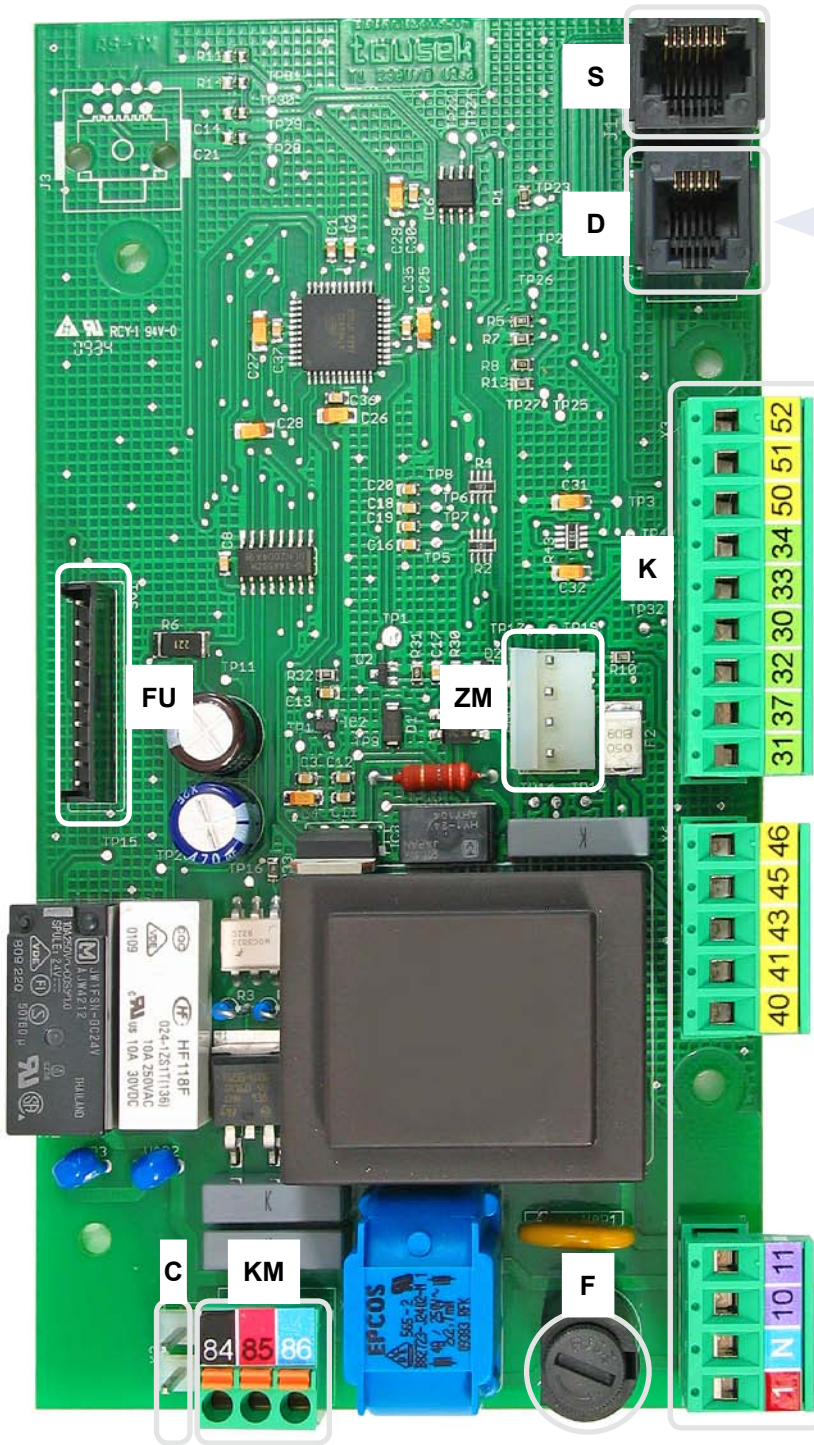
2.3 Dismantling

The dismantling of motor is made the other way around of mounting.



Before dismantling please plug off power supply of motor !

Overview of the control unit



Important

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



Attention

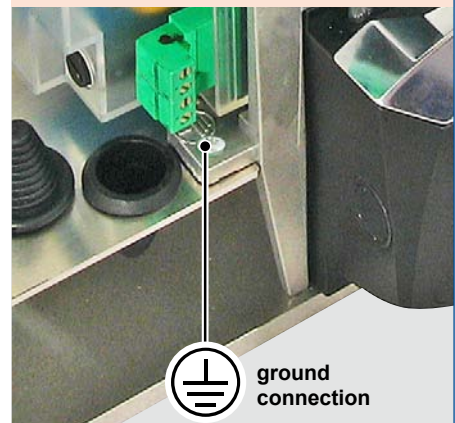
*) After connection, the wires have to be fixed with binders.

This should prevent a 230V line from getting in contact with a low voltage line, in case that a wire loosens itself from the terminal



Grounding

The grounding connection is made on the operator housing with the designated grounding screw!



Elements of control board

- (K) Terminal blocks
- (KM) Motor clamps
- (C) Condenser plug
- (S) Sensor plug
- (D) Display plug
- (FU) Slot for optional radio receiver
(see page 24 for connection)
- (ZM) Connection slot for optional module
(see page 21)
- (F) Safety fuse T 4A

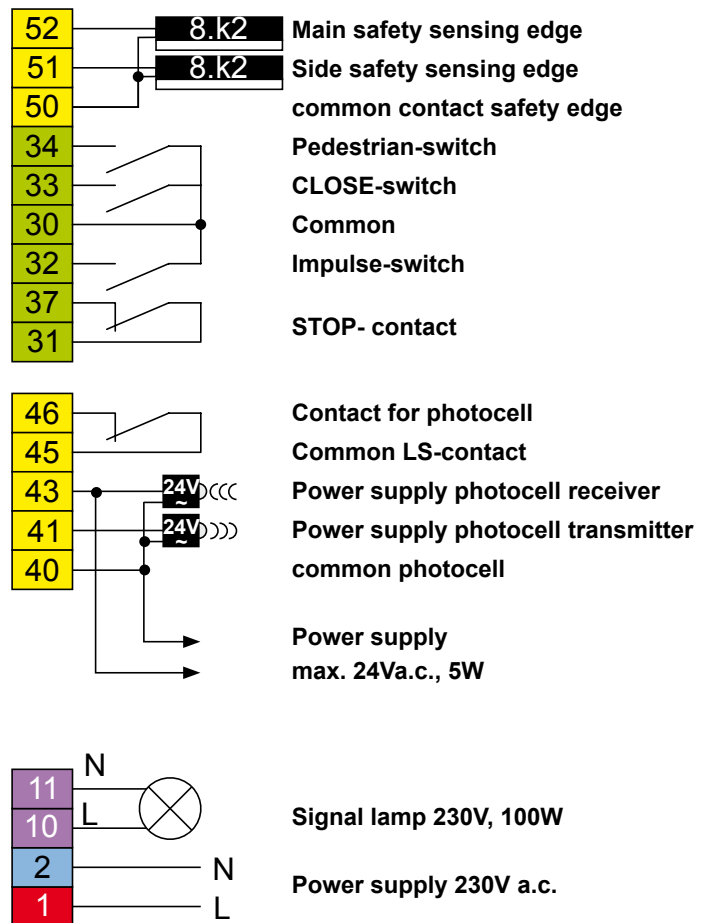
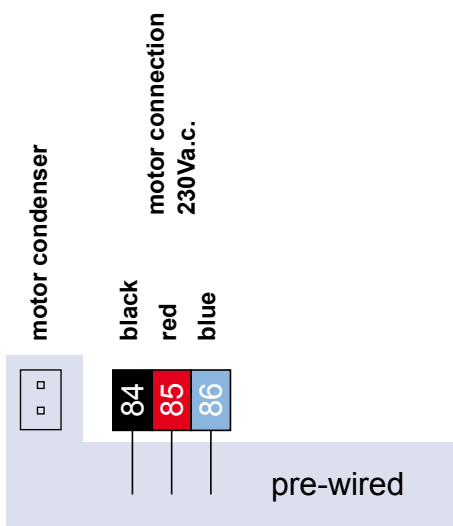


Warning notes

- Before taking off the control cover, the mains 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 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 (buttons, radio, photocells, etc.) have to be laid separately from the 230V lines (supply line, motors, signal lamp).



- During connection, adjustment and maintenance works please take care, that the electronic circuit board won't be damaged by moisture (rain).

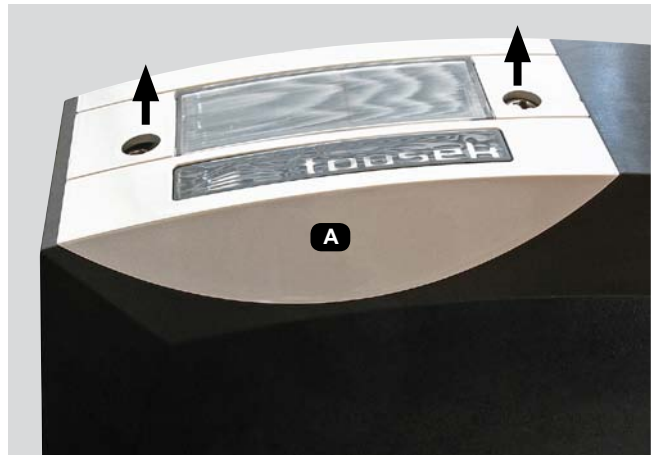
Programming buttons

Adjustment - overview



- Before starting the programming, please choose the language. Use the buttons **+** or **-** to choose menu language and confirm with **✓**.
- Note: Language selection can also be chosen by pressing the ESC button (↵) for 5s, from any position in menu.

- For programming please remove cover (A) of control device (loosen 2 bolts).
- The text display (T) informs you about operating status, chosen menus and the adjustment of various parameters..
- The programming of the control is carried out with the help of four buttons (**+**, **-**, **✓** (=Enter) and ↵ (=Escape).
- Scrolling through the available menu points (up/down) or the adjustment of a parameter (value increase/decrease) is carried out with buttons **+** and **-**..
AUTO-COUNT: when holding one of the buttons the value changes automatically.
- When pressing the **✓**-button a confirmation for entering the shown menu point, resp. for accepting the shown value of a parameter is given.
- When pressing the ↵-button you return to the superior menu point. Possibly changed adjustments of a parameter are rejected with this button (the former values will remain).
- **AUTO-EXIT:** if no button is pressed during 1 min. then the menu switches automatically to the "ready" menu (without saving changed parameters).



Programming menu

Adjustment - overview



The program menu is divided into "BASIC SETTINGS" and "MENU CONTROL"

BASIC SETTINGS

- **When entering the programming of the control unit for the first time you will see the BASIC SETTINGS**
- Here the necessary adjustments which are necessary for the use of the operator/gate can be set quickly.
- For advanced settings/programming please choose the menu point "menu (control)".

MENU CONTROL

- For further programming you will reach immediately the MENU (CONTROL) (Basis settings are skipped)
- The menu control includes all kinds of settings.



The different menu points are indicated as follows:

○ = selectable settings ⊙ = factory settings ⇄ = status display

📁 shows the menu points which are in the "BASIC SETTINGS"

	Main layer	Sub layer	Settings/adjustments
Note: some adjustments regarding function or operating logic can only be executed if gate is closed and if the display shows „ready“.	Button/switch see page 12	impulse switch	<input type="radio"/> OPEN/STOP/CLOSE <input type="radio"/> OPEN/CLOSE/OPEN <input type="radio"/> OPEN <input type="radio"/> DEAD MAN
		pedestrian button	<input type="radio"/> OPEN/STOP/CLOSE <input type="radio"/> OPEN/CLOSE/OPEN <input type="radio"/> OPEN <input type="radio"/> DEAD MAN ¹⁾
	Safety see page 14	<input type="checkbox"/> photocell	<input type="radio"/> active <input type="radio"/> not active
		<input type="checkbox"/> Main safety sensing edge	<input type="radio"/> active <input type="radio"/> not active <input type="radio"/> radio edge TX <input type="radio"/> TX 400
		<input type="checkbox"/> Side safety sensing edge	<input type="radio"/> active <input type="radio"/> not active <input type="radio"/> radio edge TX <input type="radio"/> TX 400
		photocell function	<input type="radio"/> reverse when closing <input type="radio"/> stop, after release open <input type="radio"/> during closing stop, then close
		photocell pause time	<input type="radio"/> no influence <input type="radio"/> abort pause time <input type="radio"/> re-start pause time <input type="radio"/> after opening close immediately
		photocell test	<input type="radio"/> active <input type="radio"/> not active
	Motor see page 18	max. force	<input type="radio"/> 25...100% [increment 5] <input type="radio"/> = 70%
		ARS-response time	<input type="radio"/> 0,15...0,95s [increment 0,05] <input type="radio"/> = 0,50s
speed		<input type="radio"/> 65...100% [increment 5] <input type="radio"/> = 100%	
soft stop distance		<input type="radio"/> 0...2m [increment 0,1] <input type="radio"/> = 0,5m	
soft stop speed		<input type="radio"/> 30...60% [increment 5] <input type="radio"/> = 50%	
end position OPEN		<input type="radio"/> 0...-30 [increment 1] <input type="radio"/> = -5	
end position CLOSE		<input type="radio"/> 0...-30 [increment 1] <input type="radio"/> = -5	
Operating logic see page 19	impulse button	<input type="radio"/> Stop, start of pause <input type="radio"/> impulse elimination during opening <input type="radio"/> pause time extension	
	<input type="checkbox"/> opening direction	<input type="radio"/> <<<- left <input type="radio"/> ->>> right	
	<input type="checkbox"/> operating mode	<input type="radio"/> impulse mode <input type="radio"/> automatic 1...255s [increment 5]	
	partial opening	<input type="radio"/> 10...100% [increment 1] <input type="radio"/> = 30%	
	automatic mode	<input type="radio"/> complete/partial opening <input type="radio"/> only complete opening <input type="radio"/> only partial opening	
	pause time logic	<input type="radio"/> no influence <input type="radio"/> constant open in automatic mode	
Lights/Lamps see page 20	prewarning OPEN	<input type="radio"/> OFF, 1...30s <input type="radio"/> = OFF	
	prewarning CLOSE	<input type="radio"/> OFF, 1...30s <input type="radio"/> = OFF	
	additional module	<input type="radio"/> courtyard lamp/control lamp <input type="radio"/> gate status 1 <input type="radio"/> gate status 2	
	courtyard lamp ¹⁾	<input type="radio"/> OFF, 5...950s <input type="radio"/> = OFF	
	control lamp ¹⁾	<input type="radio"/> on at opening and closing <input type="radio"/> flashes slowly / illuminates / flashes faster <input type="radio"/> illuminates in opening position	
Diagnosis see page 22	status display	<input type="checkbox"/> status display of all inputs	
	delete positions	<input type="radio"/> NO <input type="radio"/> YES	
	factory setting	<input type="radio"/> NO <input type="radio"/> YES	
	software version	<input type="checkbox"/> show software version	
	serial number	<input type="checkbox"/> show serial number	
	protocol	<input type="checkbox"/> show protocol notes	
	status sensor	<input type="checkbox"/> show sensor	

¹⁾ The menu points courtyard lamp and control lamp will only appear on display if in menu „Additional module“ courtyard lamp/control lamp is selected.



ESC

ENTER

integr. control board for sliders PULL T5, -T8, -T10



Warning notes

- Before taking off the control cover, the mains 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 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 (buttons, radio, photocells, etc.) have to be laid separately from the 230V lines (supply line, motors, signal lamp).



The different menu points are indicated as follows:

- = selectable setting ⊙ = factory settings ⇌ = status display
- Ⓜ shows the menu points which are in the "BASIC SETTINGS"

- A general status display of all inputs can be found in the menu DIAGNOSIS / STATUS DISPLAY

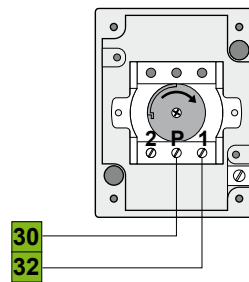
Buttons/switches

Connections and adjustments

Impulse switch (terminals 30/32)

Buttons/switches

- ⊙ **OPEN/ STOP / CLOSE impulse repetition** (factory settings): After a command of the impulse switch the motor starts an open or close movement. If the impulse switch is pressed again during this movement, the motor stops. With the next command, the motor drives in the opposite direction of the last gate movement.
- **OPEN / CLOSE / OPEN impulse repetition:** After a command of the impulse switch the motor starts an open or close movement. If the impulse switch is pressed again during this movement, the motor reverses.



Impulse switch (e.g key switch EPZ 1-2T)



- In this operation mode it is not possible to stop the motor with the impulse switch – it always travels 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 open commands are accepted of 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 – closing the gate with the impulse switch is not possible. As soon as the switch is released, the gate stops. If hold to run operating mode is selected, the radio receiver is set out of order for reasons of safety.



IMPORTANT: Do not put into operation in dead man mode.
Select only after putting into operation (see page 26), if desired.

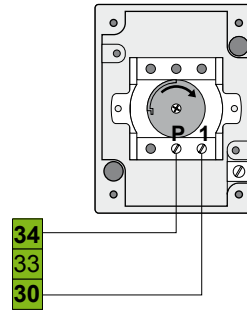


As impulse emitters pushbuttons or key switches as well as external radio receivers with potential free make contacts can be used.

Pedestrian opening button (terminals 30/34)

Buttons / switches

- **OPEN/ STOP / CLOSE impulse repetition:**
After a command of the pedestrian opening button the motor for pedestrian opening starts with an open- or closing movement. If the button is pressed again during this movement, the motor stops. With the next command the motor drives in the opposite direction of the last gate movement.
- **OPEN / CLOSE / OPEN impulse repetition:** after a command of the pedestrian opening button the motor starts an open or close movement. If the button is pressed again during this movement, the motor reverses.



pedestrian opening button
(e.g. key switch EPZ 1-1T)



- In this operation mode it is not possible to stop the motor with the pedestrian button – it always travels 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 open commands are accepted of the pedestrian opening button. Closing the pedestrian entry with the button is not possible.
- **DEADMAN:** The motor opens as long as the pedestrian button is pressed – closing the gate with the pedestrian button is not possible. As soon as the switch is released, the gate stops.

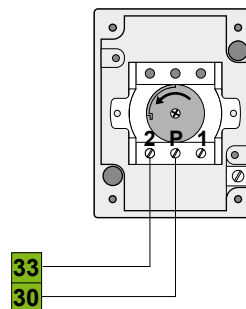


As impulse emitters pushbuttons or key switches as well as external radio receivers with potential free make contacts can be used.

CLOSE-button (terminals 30/33)

Buttons / switches

- A command with the CLOSE-switch engages closing of gate. In deadman mode the gate closes as long as the CLOSE-switch is pressed/switched. As soon as switch is released the gate movement stops.



CLOSE-button
(e.g. key switch EPZ 1-2T)



As CLOSE-buttons you may use pushbuttons or key switches as well as external radio receivers with potential free make contacts can be used.

STOP-switch (terminals 31/37)

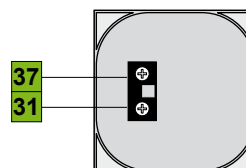
Buttons / switches

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



Important

31 ← **37** If no stop switch is connected, terminals 31/37 have to be wire-bridged.



STOP-switch
(e.g. switch KDT-1N)

As stop switch a maker contact has to be used. If the switch is actuated, the gate stops in any desired position.



Photocells

- The control unit has a power supply connection for a 24V a.c. photocell (LS):
supply LS-transmitter: terminals 40/41 / supply LS-receiver: terminals 40/43.
Note: in „gate closed“ position the terminals 40/41 are being switched into energy saving mode - no current (only if no radio transmission system TX 310 is used) !
- The contact has to be closed when using powered and positioned photocells (opening contact).
Connection of the photocell contact: terminals 45/46

- When using two pairs of photocells please do not install both photocell transmitters/receivers on the same side (to eliminate interference between both) !

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

Standard:



With SYNC-function:



• **Photocell self-test function:**

The control board is equipped with a self-test function for the connected photocell. With an opening impulse (switch or button) the transmitter of the photocell is switched off for a short time in gate position „closed“ . Thus the photocell receiver interrupts the contact 45/46 - so the control board verifies the function of the photocell receiver. If this short interruption at the photocell input is not carried out, the control board reports an error. **The deactivation of the self-test function is only allowed if the safety installations correspond to the category 3 !**

- The exact function of the photocells depend on the programming of the control unit.
Photocell function please see menu point SAFETY / photocell function or photocell with pause time (S. 17)
- **You will find detailed information in the corresponding photocell manual.**

Photocell (Contact: terminals 45/46)

Safety

- Ⓒ **active:** to be selected, if photocell should be triggered.
- **not active:** to be selected, if photocell should not be triggered.

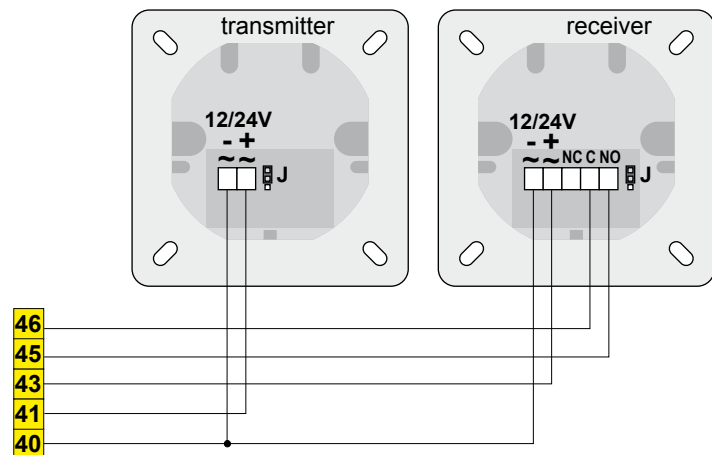
Photocell - connection examples

Photocell Tousek LS 26 as safety device

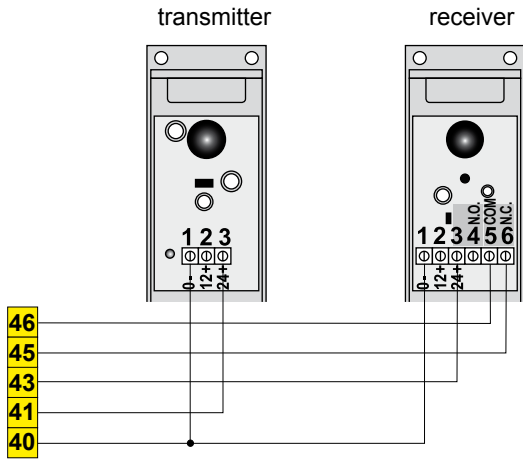


Important

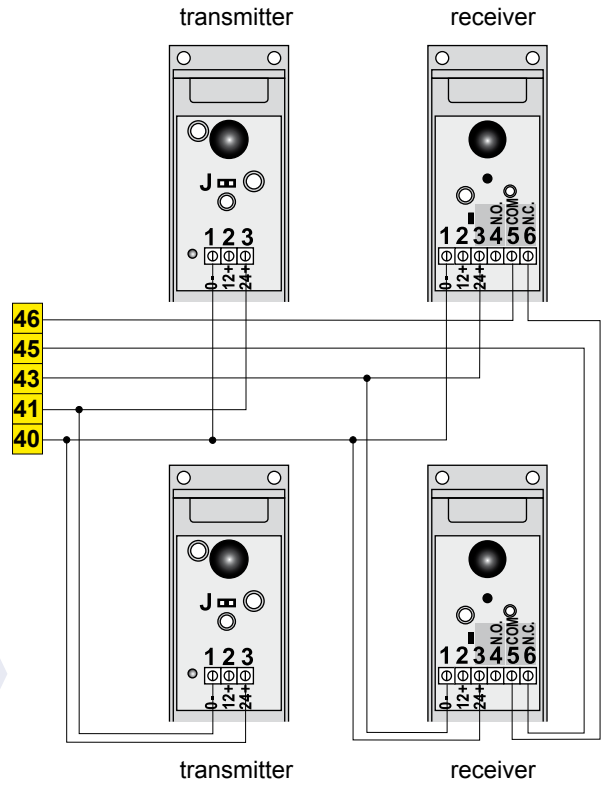
- Jumper J of transmitter and receiver has to be adjusted in the same way.



**Photocell Tousek LS 41
as safety device**

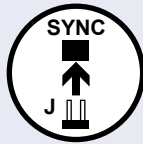


**2 Photocells Tousek LS 41 as safety-
device with active SYNC-function**

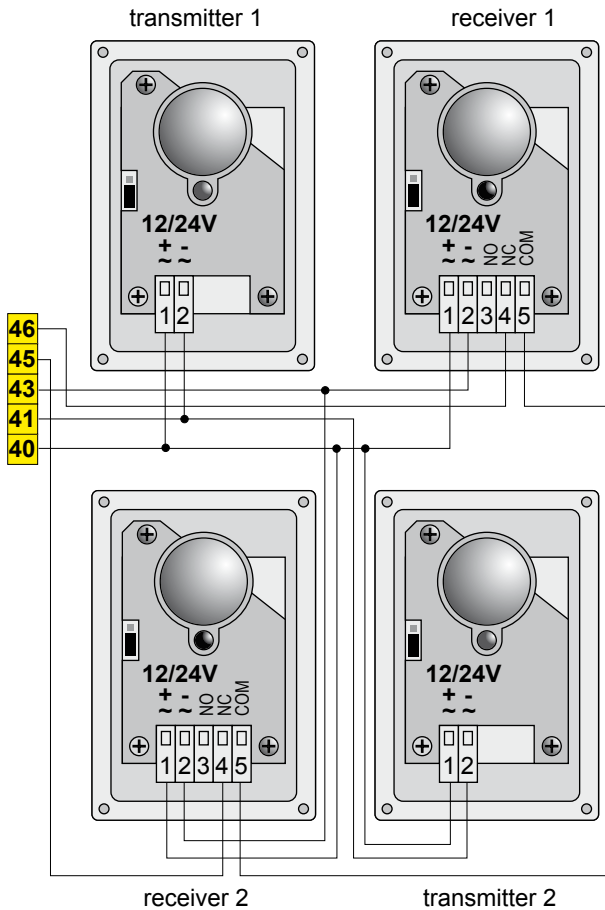


Activation of SYNC-function

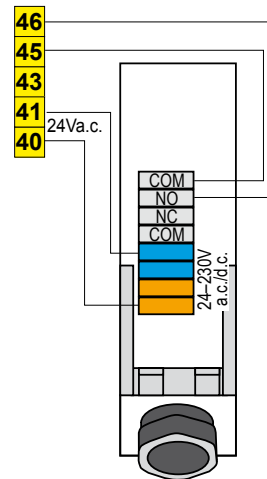
- To activate the SYNC-function, the plug-in bridges (J) in both photocell transmitters **have to be removed**. (see manual LS 41).



**2 Photocells Tousek LS 45/2
as safety device**



**Photocells Tousek RLS 610
as safety device**



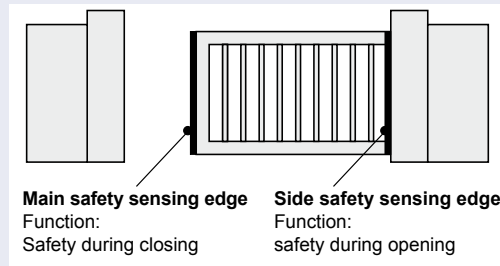
Important

- as the LS 45/2 has no SYNC-function, both photocell transmitters and receivers must be mounted on different sides!



Safety sensing edges (main and side edge)

- **OBSTACLE DETECTION:** when a contact strip/safety edge is triggered/activated then a change of direction is effected for 1 second. After that the gate continues to move in the changed direction.

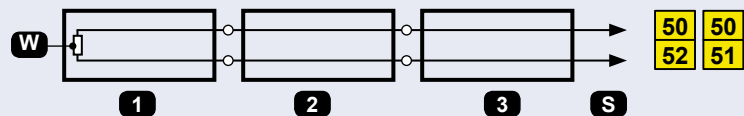


Main safety sensing edge
▼
Side safety sensing edge
▼

Hence if safety edges have to react on obstacles in closing movement have to be serially connected to the terminals of the main safety edge.

Safety edges that have to react on obstacles in opening movement have to be serially connected to the terminals of the side safety edge.

Example: W 8,2kΩ final resistance
1 final edge
2+3 passage edge
S to control board



When connecting one safety edge a final edge (1) has to be used.

G Main safety sensing edge (terminals 50/52)

Safety

- ⊙ **active:** to be selected if the contact strip (8,2kΩ) of main safety sensing edge should be evaluated.
- **not active:** to be selected if the contact strip of main safety sensing edge should NOT be evaluated
- **Radio transmission TX:** to be selected if safety sensing edge (8,2kΩ) of main entrance edge should be evaluated **with the radio transmission system TX 310.**
- **TX 400:** to be selected if safety sensing edge (8,2kΩ) of main entrance edge should be evaluated **with the system TX 400i.**

G Side safety sensing edge (terminals 50/51)

Safety

- ⊙ **active:** to be selected if the contact strip (8,2kΩ) of side safety sensing edge should be evaluated.
- **not active:** to be selected if the contact strip of side safety sensing edge should NOT be evaluated.
- **Radio transmission TX:** to be selected if safety sensing edge (8,2kΩ) of side entrance edge should be evaluated **with the radio transmission system TX 310.**
- **TX 400:** to be selected if safety sensing edge (8,2kΩ) of side entrance edge should be evaluated **with the system TX 400i.**



- Connection and detailed information of radio transmission system TX 310 see according manual.
- Connection and detailed information of inductive system TX 400i see according manual.



Important

- **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

Safety

- ⊙ **Reverse at closing:** 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.
- **Stop at closing, after release open:** an interruption of the photocell during closing makes the motor stop as long as the photocell stays interrupted. After release of the photocell, the gate opens.

Photocell with pause time

Safety

- ⊙ **no influence:** the photocell doesn't have any influence on the pause time in automatic mode.
- **Immediate closing:** in automatic mode an interruption of the photocell during pause time shortens the pause time. After release of the photocell the gate starts closing.
- **Restart 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.
- **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.

Photocell 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 !

Max. force ☉ 70% (factory setting) Motor

- 25–100% adjustable [increment 5]: determines the max. possible motor force.

ARS response time ☉ 0,50s (factory setting) Motor

- 0,15–0,95s adjustable [increment 0,05]: determines, in which time the AR-System responds. The lower the value, the more sensitive the sensor will react.

Speed ☉ 100% (factory setting) Motor

- 65–100% adjustable [increment 5]: determines the speed of motor.

Soft stop distance ☉ 0,5m (factory setting) Motor

- 0–2m adjustable [increment 0,1]: determines the distance of soft run.

Soft stop speed ☉ 50% (factory setting) Motor

- 30–60% adjustable [increment 5]: determines the speed during soft run.

End position OPEN ☉ -5 (factory setting) Motor

- 0...-30 adjustable [increment 1]: for readjustment of the automatically detected OPEN limit position of gate (e.g. for safety sensing barriers). With adjustment 0 the motor runs to the previously learned open position. For a diminished drive distance the value can be extended to up to -30.

This adjustment is ONLY adopted in CLOSED-position.

End position CLOSE ☉ -5 (factory setting) Motor

- 0...-30 adjustable [increment 1]: for readjustment of the automatically detected CLOSE limit position of gate (e.g. for safety sensing barriers). With adjustment 0 the motor runs to the previously learned close position. For a diminished drive distance the value can be extended to up to -30.

This adjustment is ONLY adopted in CLOSED-position.

**Attention**

With force adjustment the valid safety regulations and standards have to be strictly followed !

Impulse switch/button

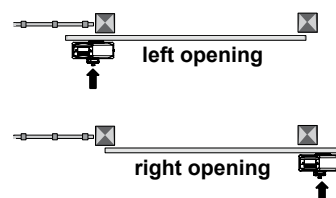
Operation logic

- ⊙ **Stop at opening and start of pause time:** An impulse during the opening movement stops the gate and starts pause time in automatic operation. When the pause time has run out, the gate closes automatically.
- **Impulse suppression at opening:** Commands received during the opening movement are suppressed, commands during closing are accepted.
- **Pause time extension:** A command during pause time restarts the pause time. If this menu point is chosen, an impulse suppression during opening is active at the same time.

G Opening direction

Operation logic

- ⊙ <<<- **left:** gate opens to the left side (seen from inside)
- ->>> **right:** gate opens to the right side (seen from inside)



This adjustment is ONLY adopted in CLOSED-position.

G Operating mode

Operation logic

- ⊙ **Impulse mode:** Impulse through impulse switch/button or CLOSE-button to start closing of gate.
- **Automatic mode, pause time 1-255s adjustable [5 steps]:** gate closes automatically after the adjusted pause time

Partial opening ⊙ 30% (factory setting)

Operation logic

- **10-100% adjustable [1 steps]:** value defines the partial opening of the total opening.

This adjustment is ONLY adopted in CLOSED-position.

Automatic mode

Operation 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.
- **Only partial opening:** only after partial opening the gate closes automatically after the the adjusted pause time.

Pause time logic

Operation logic

- ⊙ **no influence**
- **Permanent open in automatic mode:** if this function is activated, the control unit goes from automatic mode into impulse mode **with activated pause time through impulse in open gate position for this cycle** , hence if gate is open then an impulse will end the automatic mode - the gate remains open. Only the next impulse will close the gate and the control unit goes back to automatic mode. With this function e.g. the entrance to a company site can remain open during the day (1st impulse in gate open position) and closed in the evening (2nd impulse). The control board switches back to automatic mode (autom. opening and closing of gate).



Warning

- Before connection works please turn off the main power switch !
- Safety rules please see page 12 !



Pre-alert OPEN (Signal lamp: terminals 10/11)

Light / Lamps

- ⊙ turned off
- **1–30s adjustable:** Before each opening movement the signal lamp/ flashing light is activated for the adjusted time.

Pre-alert CLOSE (Signal lamp: terminals 10/11)

- ⊙ turned off
- **1–30s adjustable:** Before each closing movement the signal lamp/ flashing light is activated for the adjusted time.



Signal lamp

- a signal lamp can be connected to the terminals 10/11 (230V, max. 100W).



Additional module (Description add. modules page 21)

Light / Lamps

- ⊙ **Courtyard lamp/control lamp:** the menu points courtyard lamp and control lamp are ready for adjustment and Control lamp zur Einstellung bereit (that means if not selected, these menu points will not be shown on the display)
- **Gate status 1:** with the two potential-free signal contacts K1 and K2, the gate end positions (limits) can be evaluated.
- **Gate status 2:** with the two potential-free signal contacts K1 and K2, the gate end positions (limits), the gate movement as well as a gate stop outside of the end positions can be evaluated.

		Function	K1	K2
1	Gate status display	Gate in CLOSE-Position	1	0
		Gate in OPEN-Position	0	1
2	Gate status display	Gate in CLOSE-Position	0	0
		Gate opens or closes	0	1
		Gate stopped or fault (Gate not in end position)	1	0
		Gate in OPEN-position	1	1

0 = signal contact open, 1 = signal contact closed



- You will need for use of adjustments one of the selected adjustments (courtyard-/control I hence gate status 1 or 2.

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 21)

Light / Lamps

- ⊙ turned 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.

Pilot (control) lamp (Description add. modules page 21)

Light / Lamps


- ⊙ **Illuminates at opening/closing:** The pilot lamp output is activated during opening- and closing movement.
- **Flashing/illuminates/flashing rapidly:** 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
- **Illuminated when gate is open:** Pilot lamp is illuminated as soon as the gate has reached end position open.

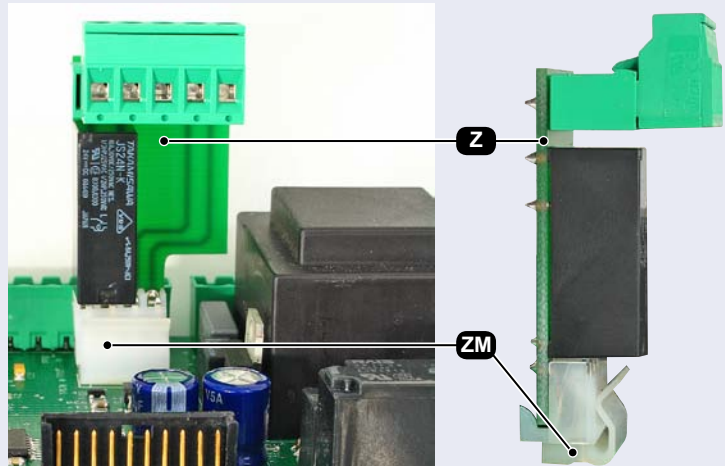
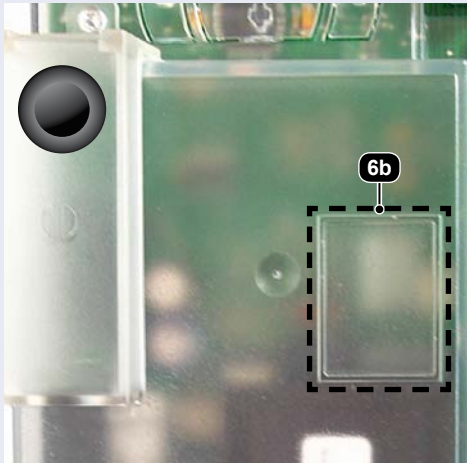


Additional module Courtyard lamp/control lamp hence gate status display

- The use of one of the additional 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 ! 
- cut the mark **(6b)** open.
- Plug additional module **(Z)** through opening onto the slot **(ZM)**.



Additional module Courtyard lamp/Control lamp

- On the terminals 12/13 a courtyard lamp (**H**) can be connected: **230V, max. 100W**
- On the terminals 70/71 a control lamp (**K**) can be connected: **24Vd.c., max. 2W**



Additional module Gate status display

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



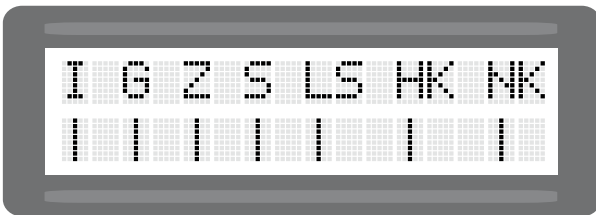
Status display

Diagnosis

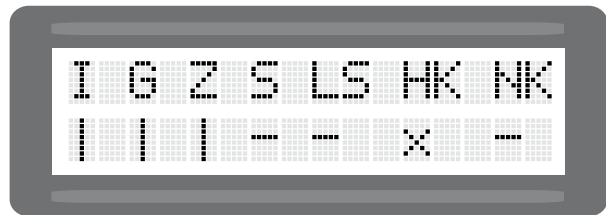
➔ **Status display** for inputs as photocell, safety sensing edges, stop button, impulse switch

I	Impulstaster		status: okay
P	pedestrian entry		status: okay
C	CLOSE-button	---	status: not okay or triggered
S	STOP-button	---	status: not okay or triggered
Ph	photocell contact		status: okay
ME	main safety edge	X	status: safety sensing edge interrupted
SE	side safety edge	---	status: not okay or triggered

for example



All inputs okay.



Impulse switch, pedestrian opening button and closing button okay. Stop-button and photocell not ok. Main sensing edge interrupted. Side closing edge not okay or triggered.

Delete positions

Diagnosis

- ⊙ **NO:** does not delete the end positions "gate closed" and "gate open"
- **YES:** the determined end positions are being 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

Diagnosis

- ⊙ **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

Diagnosis

➔ shows the software version on display

Serial number

Diagnosis

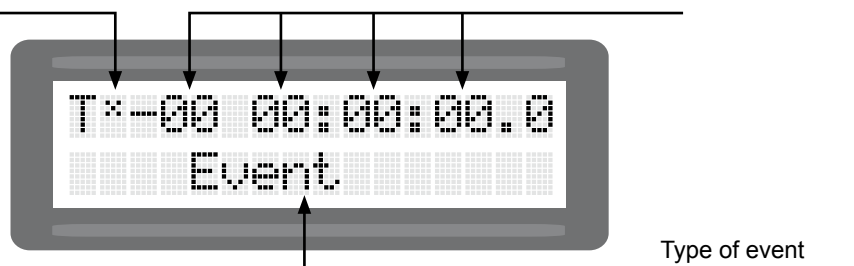
➔ shows der Seriennummer am Textdisplay

Protocole

Diagnosis

➔ **shows the protocole list on display:** all events that take place are protocoled 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



Status Sensor

Diagnosis

➔ Degree and signal strenght of rotation speed sensor is shown on display.

4. Emergency release in case of power failure (note for the user)

PULL T5, -T8, -T10

In case of a power failure or other defect the drive pinion can be disengaged from the gearmotor as follows:

- **Switch off power supply**



- Slide key-cover (A) slightly to the front and turn it away. Insert the key and turn it clockwise to its limit stop (the emergency release mechanism can be key-locked both in the engaged and in the disengaged position).
- Turn the handle 180° counter-clockwise (viewed from above). The gate can now be manually opened or closed.

Re-engaging the emergency release mechanism:

To return to normal motor operation please turn the handle back to its original position (i.e. 180° clockwise)

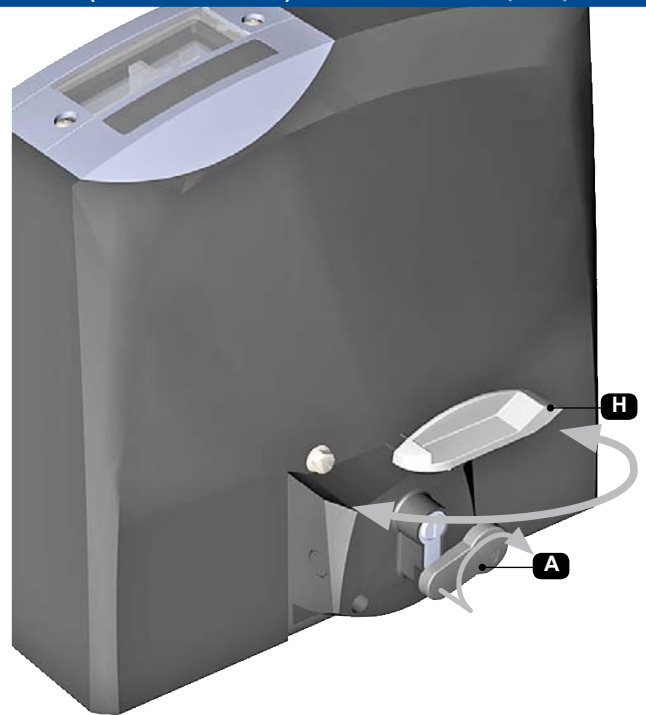


Important

- after the handle is back in normal position, slowly move the gate manually in its travel direction until you can hear that the gearing has re-engaged!

Then lock it again and remove the key.

With next command the motor searches the open position (a new learning of end positions is not necessary).

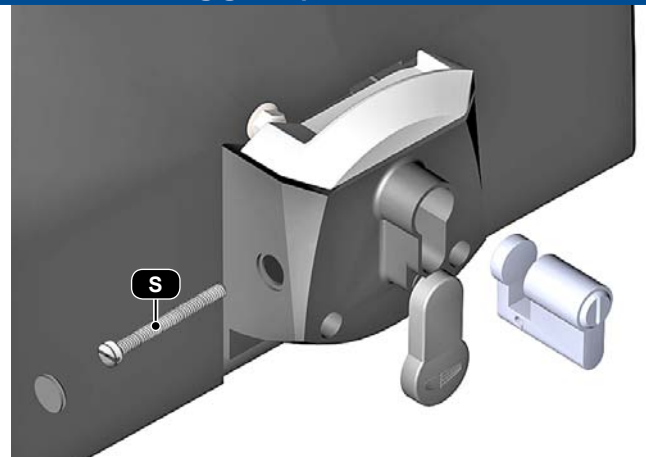


Handle in picture shows unlocked position

5. Exchanging the lock half cylinder

Sliding gate operator PULL T5, -T8, -T10

- Remove the screw protection cap and turn out the screw (S).
- Turn the cylinder protection cap down, insert the key, turn it approx. 90° clockwise, and pull out the cylinder.
- To re-insert the cylinder please carry out the above steps in the reverse order



- Disconnect the power supply.

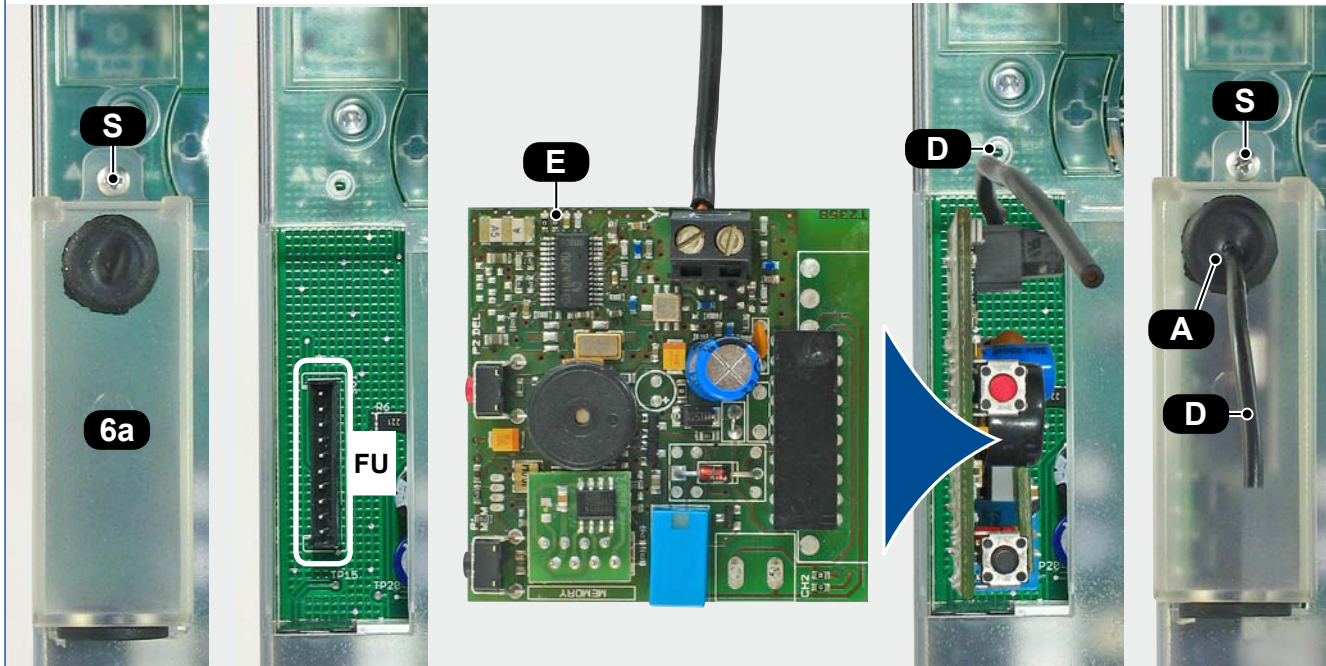


- Remove radio cover (6a) after loosening the bolt (S).
- Plug-in the receiver printed circuit board (E) RS433/868-STN1 (1 channel) or RS433/868-STN2 (2 channels) into the corresponding slot (FU) as shown in the picture.
- Slide the antenna cable (D) through the output connection (A).
- Place the radio cover (6a) back and fix it with bolt (S).
- To increase the range 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.
- With the RS 433 version a connecting cable from the terminals of the receiver board to the pedestrian button input of the control unit is required.
- For programming of receiver please *see manual for radio receiver.*





Important notes after installation

- **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.**
- 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 (especially children have to be instructed). 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.
- **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.**
- The electric motor heats up during operation. Therefore the device should only be touched after it has cooled off.
- **After installation the proper function of the gate facility and the safety devices has to be checked!**
- 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..

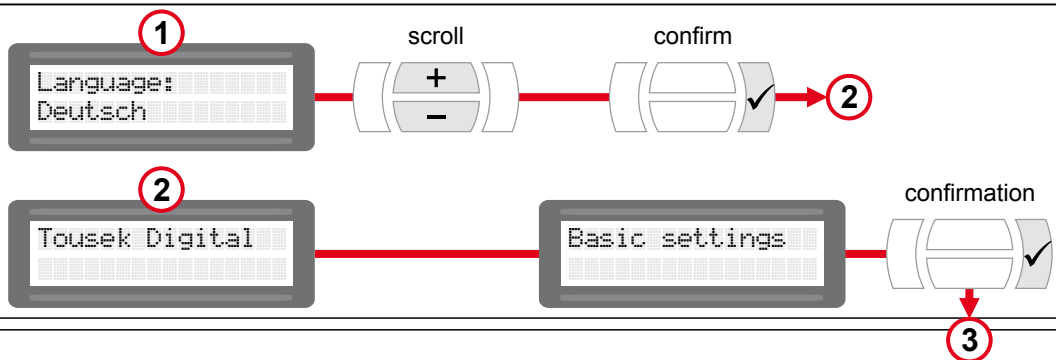


Important: preparation works

- Connect control panels, safety devices to the motor under the safety regulations in .
 - **Attention: if no stop switch is connected then the terminals 31/37 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.
 - Switch on the system (assuming proper connection).
 - **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.
- Note: during operation with the basic setting for limit positions OPEN/CLOSE (= -5), the limit stops will not be reached (only with adjustment = 0)**

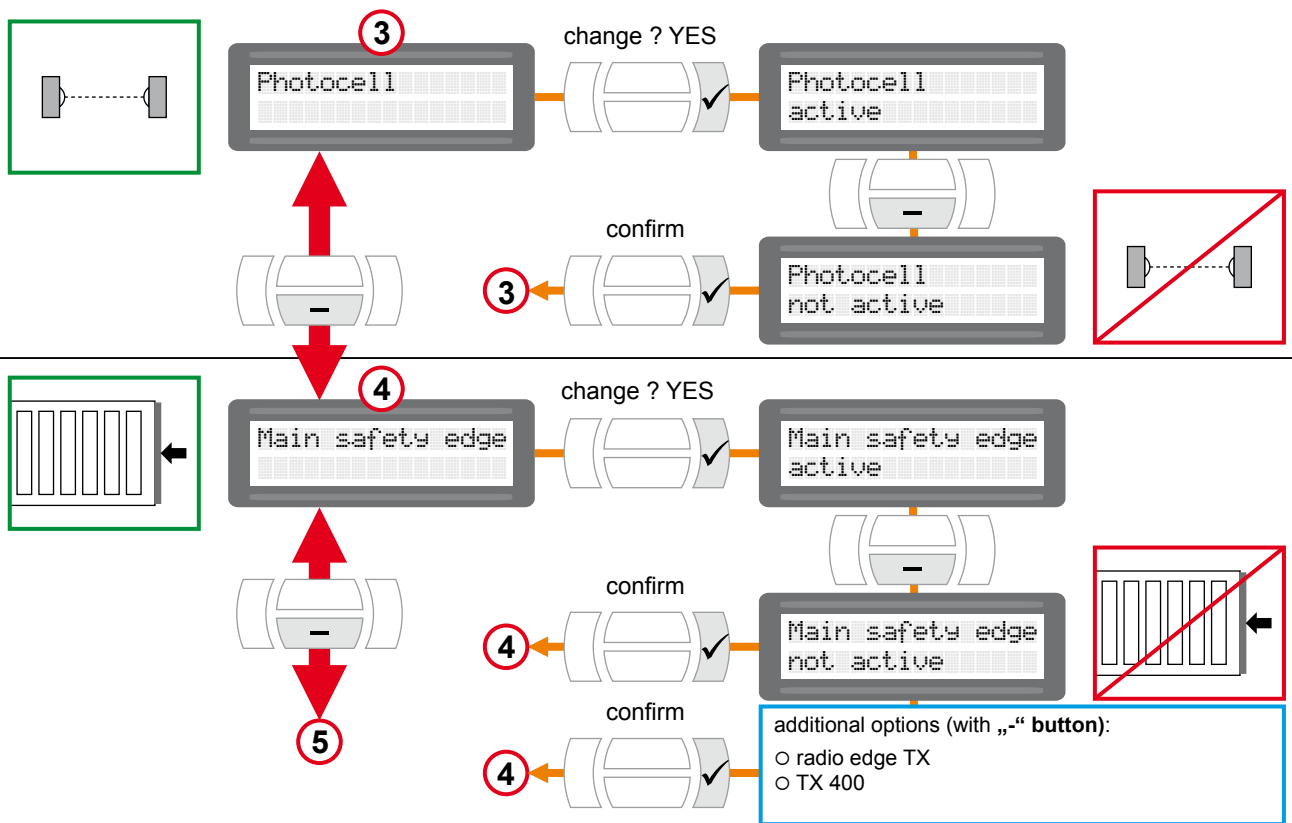
LANGUAGE SELECTION

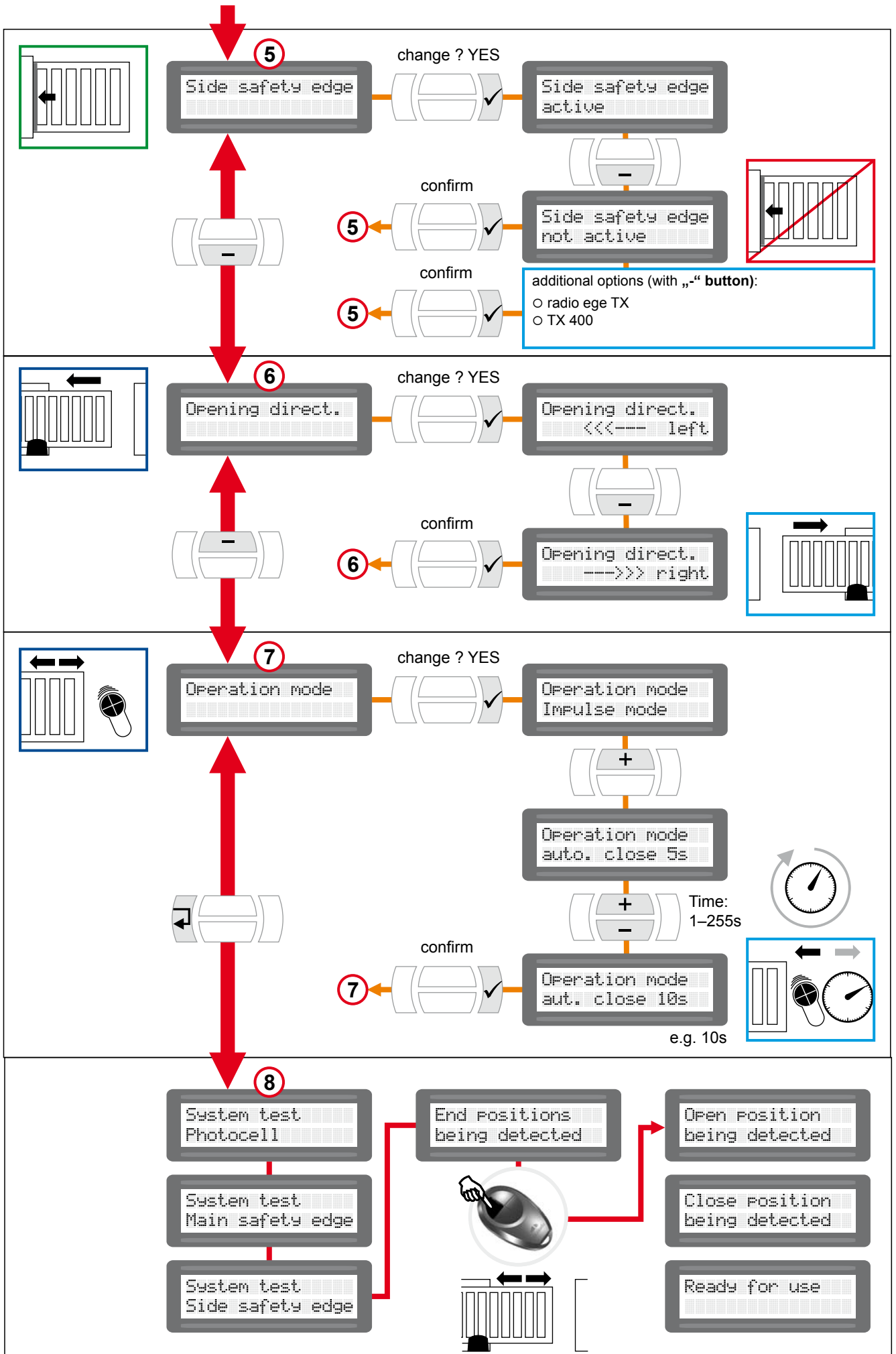
- Can be selected during initial operation (hence after reset to factory settings).
- Can be also chosen by pressing the ESC button (↵) for 5s, from any position in menu.



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 (see menu page 11).
- The next programming adjustments are made in the main settings menu (see page 10, 11).



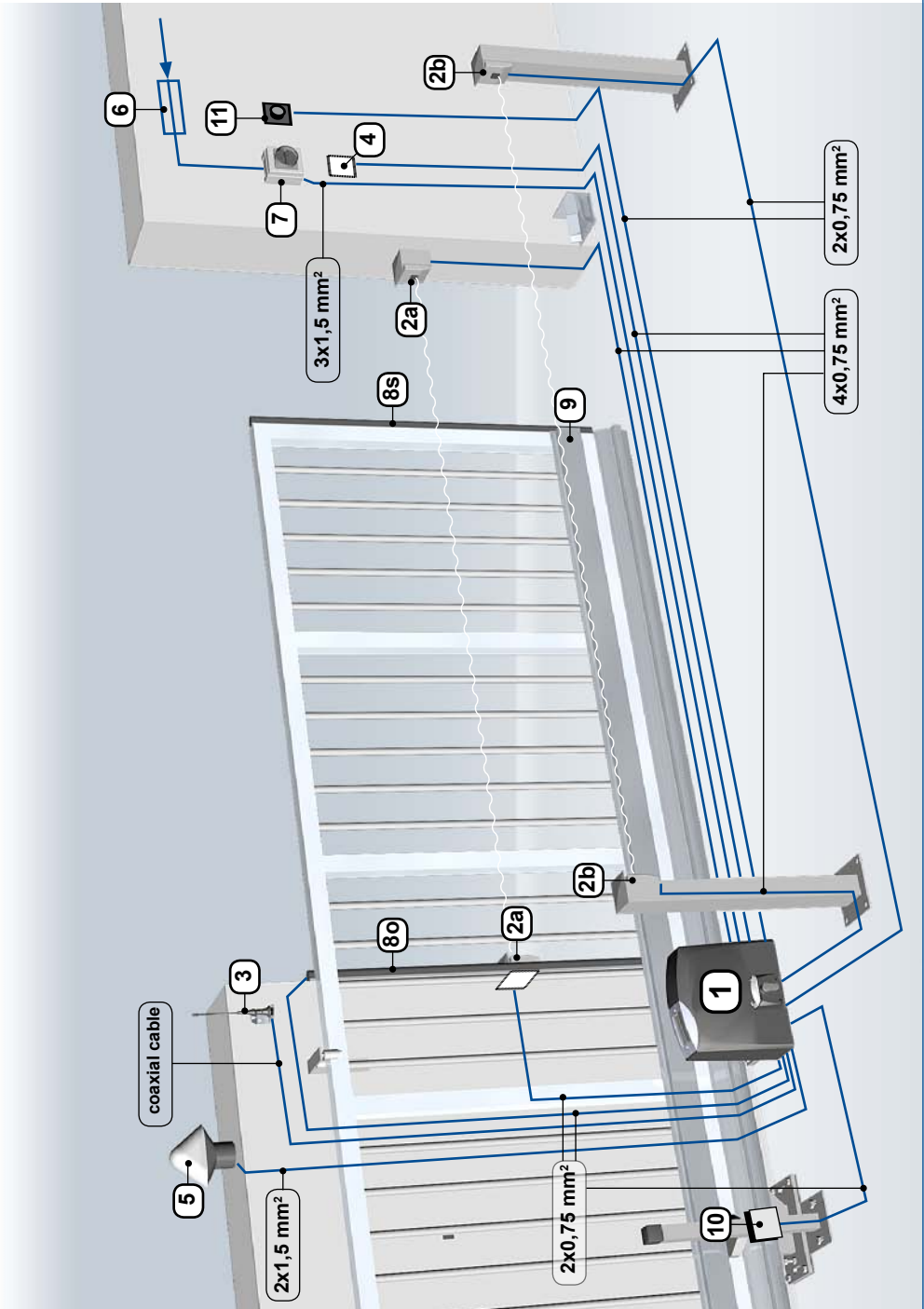


Error	possible reason	solution
Display: „Stop-button released“	stop-button not connected or not bridged	Stop-button (KI.) connect or bridge > use status display for help
Display: „Photocell released“	photocell interrupted	check correct connection hence remove obstacle > use status display for help
Display: „Main safety sensing edge released“	main safety edge interrupted or hot-wired	check correct connection hence remove obstacle > use status display for help
Display: „Side safety sensing edge released“	Side safety sensing edge interrupted or hot-wired	check correct connection hence remove obstacle > use status display for help
Display: „AR-System released“	Gate ran into an obstacle or is too hard to move	check adjustment of forces, remove obstacle hence check if gate is easy to move
Display: „photocell test negative“	interruption or hot-wired photocell	check correct connection hence remove obstacle > use status display for help
Display: „main safety edge test negative“ (only when using the TX 310)	Short-circuit or interruption of main safety edge	check correct connection hence battery status of transmitter > use status display for help
Display: „side safety edge test negative“ (only when using the TX 310)	Short-circuit or interruption of side safety edge	check correct connection hence battery status of transmitter > use status display for help
Display: „Low voltage“	undervoltage	check supply line
No reaction when giving an impulse	no line voltage hence safety fuse broken	check line voltage as well as safety fuses
	error of transmitter/control device/impulse button, e.g. transmitter not programmed	check transmitter/control device, e.g. program transmitter and check battery
Control relays are switching but no gate movement	motor is in emergency release (unlocked)	lock motor gearing

9. Cable plan

- 1 operator TOUSEK PULL T5, -T8, -T10
- 2 a - outer photocell / b - inner photocell
- 3 antenna for built-in radio receiver
- 4 key-operated contact switch
- 5 signal flashing light
- 6 fuse 12A

- 7 main switch 16 A
Note: An all-pole disconnecting main switch with a contact opening-gap of minimum 3 mm has to be foreseen.
- 8 safety sensing edge
- 9 power supply system TX100 for moving gate components.
When using other power supply system (e.g. TX200i)
- 10 connection socket
- 11 stop momentary contact switch



Sliding gate operator PULL T5, -T8, -T10



NOTE concerning cable laying

The electric cables have to be laid in insulating sleeves which are suitable for underground usage. The insulating sleeves have to be lead into the inner of the operator housing.

230 V cables and control lines have to be laid in separate sleeves.

Only double-insulated cables, which are suitable for underground usage (e.g. E-YY-J) may be used.

In case that special regulations require another type of cable, cables according to these regulations have to be used.



SAFETY NOTE

Please be aware that the beside picture is only a symbolic sample illustration of a gate facility and may therefore not show all safety devices required for your specific application.

To achieve an optimum safety level at your gate facility, please make sure that all safety components and accessories which - according to the applying safety rules and laws - are required in your particular case (e.g. photocells, induction loops, sensing edges, signal lamps, traffic lights, mains- and emergency power off switches etc.) are properly installed, operated, and serviced.

In this context please follow the EU Machine Directive, accident prevention rules and laws, as well as applying EU- and national standards in force at the time of installation and operation of the gate facility.

The Tousek Ges.m.b.H. cannot be held responsible for any consequences resulting from disregard of applying standards and laws during installation or operation of the gate facility.

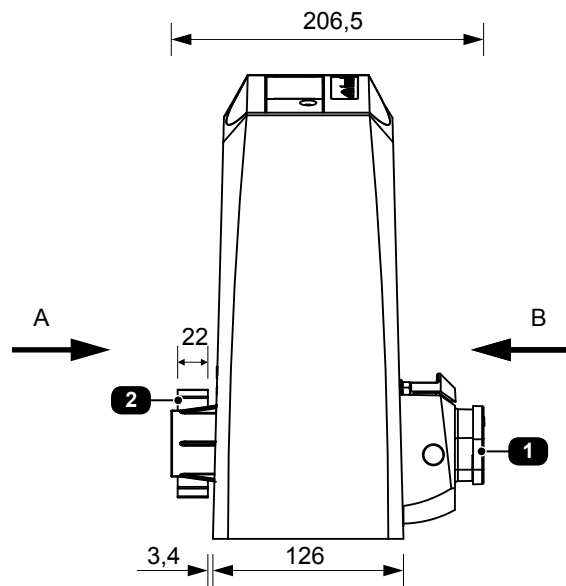
The 0,75mm² control lines are shown without ground lead. In order to facilitate connections we recommend using flexible wires and not using thicker wires for the control lines.

10. Dimensioned drawing

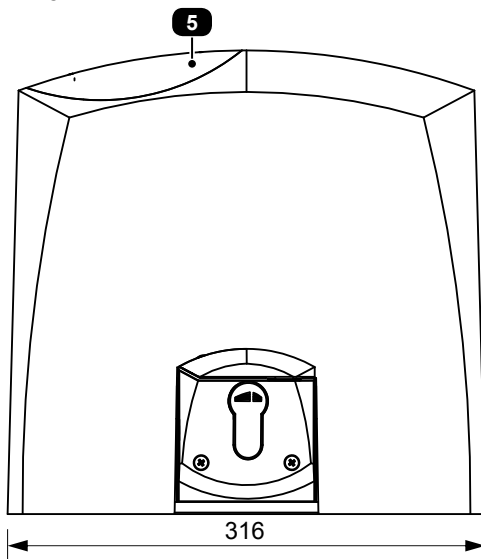
Sliding gate operator PULL T5, -T8, -T10

• Dimensions in mm

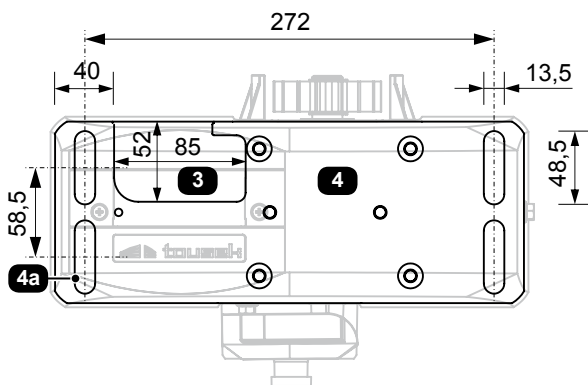
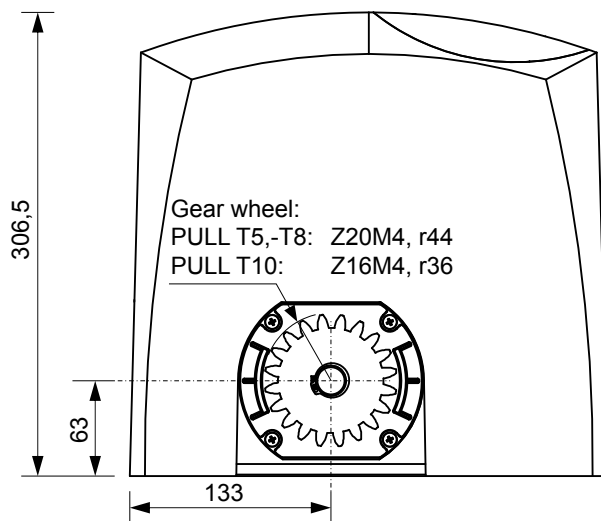
- (1) lockable emergency release (euro standard cylinder)
- (2) gear wheel
- (3) cable entrance
- (4) ground plate
- (4a) slotted holes (4x) for mounting on foundation
- (5) display for programming



View B:



View A:



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

Declaration of incorporation

In compliance with EC Machine Directive 2006/42/EC, Annex II B for the installation of an incomplete machine.

We hereby declare that the following product, as well as its version, put by us into circulation, complies with the essential requirements of the Machinery Directive (2006/42/EC), due to its design and type of construction.

The validity of this declaration will cease in case of any unauthorized modifications to the products.

The product:

Sliding gate opener PULL T5, T8, T10, T24, T24speed, T5SE, T8-Master/Slave, T8A

is developed, designed and manufactured in accordance with:

EG-Richtlinie Maschinen 2006/42/EG
EG-Richtlinie Niederspannung 2006/95/EG
EG-Richtlinie Elektromagnetische Verträglichkeit 2004/108/EG

Applied and used standards and specifications:

EN ISO 13849-1, PL-„c“
EN 60335-1
EN 60335-2/95
EN 61000-6-3
EN 61000-6-2

Following requirements of Annex I of the EC Directive 2006/42/EC are met:

1.1.2, 1.1.3, 1.1.5, 1.2.1, 1.2.2, 1.2.3, 1.2.6, 1.3.2, 1.3.4, 1.3.7, 1.5.1, 1.5.4, 1.5.6, 1.5.8, 1.7

The relevant technical documentation is compiled in accordance with Annex VII, Part B of the EC Machinery Directive 2006/42/EC.

We undertake to submit it in electronic form and within a reasonable time to the market surveillance authorities in response to a duly substantiated request.

TOUSEK Ges.m.b.H., A1230 Wien, Zetschegasse 1, Österreich

is authorized to compile the technical documentation.

The incomplete machine cannot be put into service, until it is determined that the machine, into which the incomplete machine has to be inserted, complies with the the Machine Directive 2006/42/EC.



Eduard Tousek, CEO

Vienna, 01. 01. 2013



EC Declaration of Conformity

In compliance with EC Machine Directive 2006/42/EC, Annex II, Part 1 A.

When the described operators are connected to a gate they form a machine in the sense of the EC Machine Directive.

Relevant EU directives:

Construction Products Directive 89/106/EWG
Machinery Directive 2006/42/EG
Electromagnetic compatibility 2004/108/EG
Low Voltage directive 2006/95/EG

We hereby declare that the following product, in the version put by us into circulation, complies with the essential requirements of the Directives mentioned above. The validity of this declaration will cease in case of any unauthorized modifications to the products.

Product:

Gate description

Motor description

The incomplete machine cannot be put into service, until it is determined that the machine, into which the incomplete machine has to be inserted, complies with the the Machine Directive 2006/42/EC.

Installation company

Address, ZIP code, Place

Date/ Signature

Motor number (Type plate): _____

Other components:

tousek PRODUCTS

- sliding gate operators
- cantilever systems
- swing gate operators
- garage door operators
- folding door operators
- traffic barriers
- carpark management system
- window operators
- domelight operators
- sliding door operators
- electronic controls
- radio remote controls
- key operated switches
- access control
- safety devices
- accessories

Tousek Ges.m.b.H. Austria
A-1230 Vienna
Zetschegasse 1
Tel. +43/1/667 36 01
Fax +43/1/667 89 23
info@tousek.at

Tousek GmbH Germany
D-83395 Freilassing
Traunsteiner Straße 12
Tel. +49/86 54/77 66-0
Fax +49/86 54/5 71 96
info@tousek.de

Tousek GmbH Switzerland
CH-6275 Ballwil
Bahnhofstraße 14
Tel. +41/0/41 448 2965
Fax +41/0/41 448 2966
info@tousek.ch

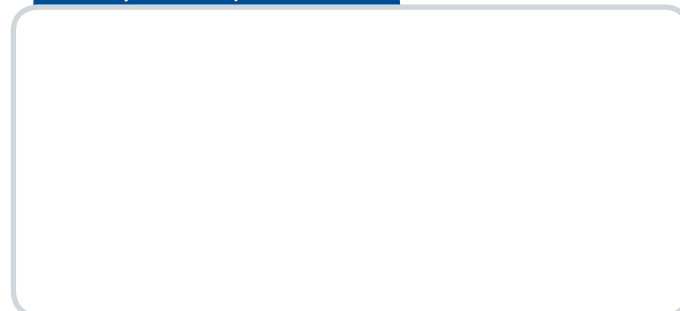
Tousek Sp. z o.o. Poland
PL 43-190 Mikołów (k/Katowic)
Gliwicka 67
Tel. +48/32/738 53 65
Fax +48/32/738 53 66
info@tousek.pl

Tousek s.r.o. Czech Republic
CZ-130 00 Praha 3
Jagellonská 9
Tel. +420/2/2209 0980
Fax +420/2/2209 0989
info@tousek.cz

tousek
E_PULL-T5-T8-T10_49002306
03. 03. 2015



your service partner:



We reserve the right to change dimensions and/or technical specifications without prior notice. Claims resulting from misprints or errors cannot be accepted.