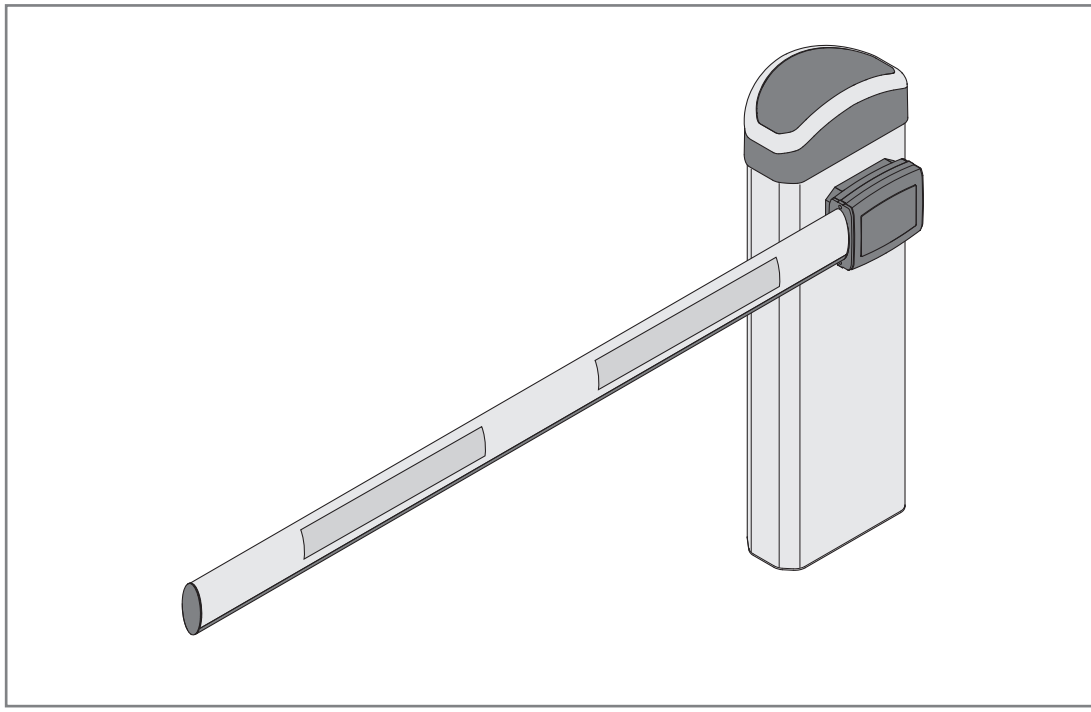
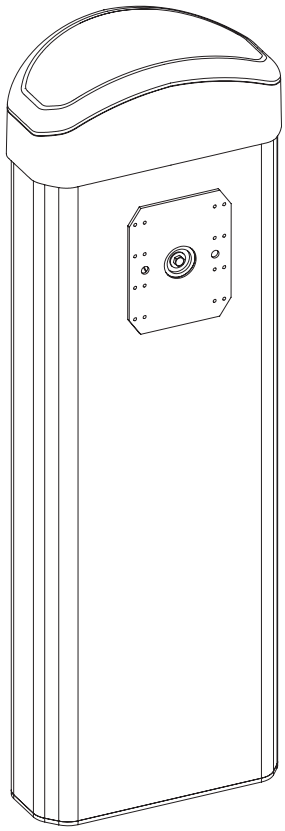
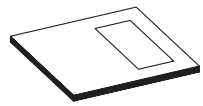


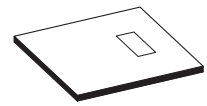
EN

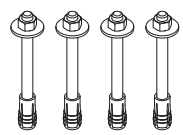
Instructions for fitting, operating and maintenance
Barrier BS 50

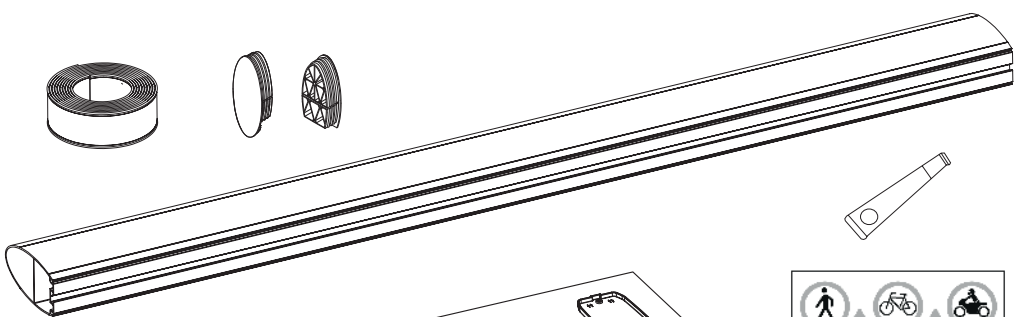
A

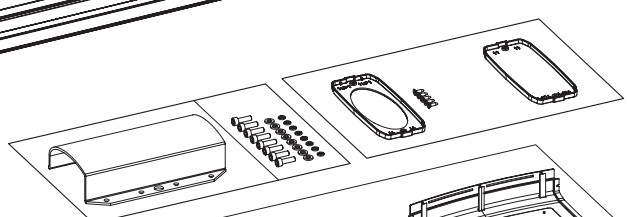


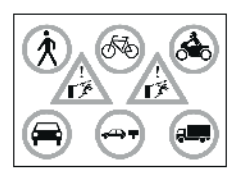


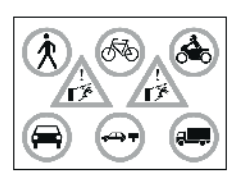




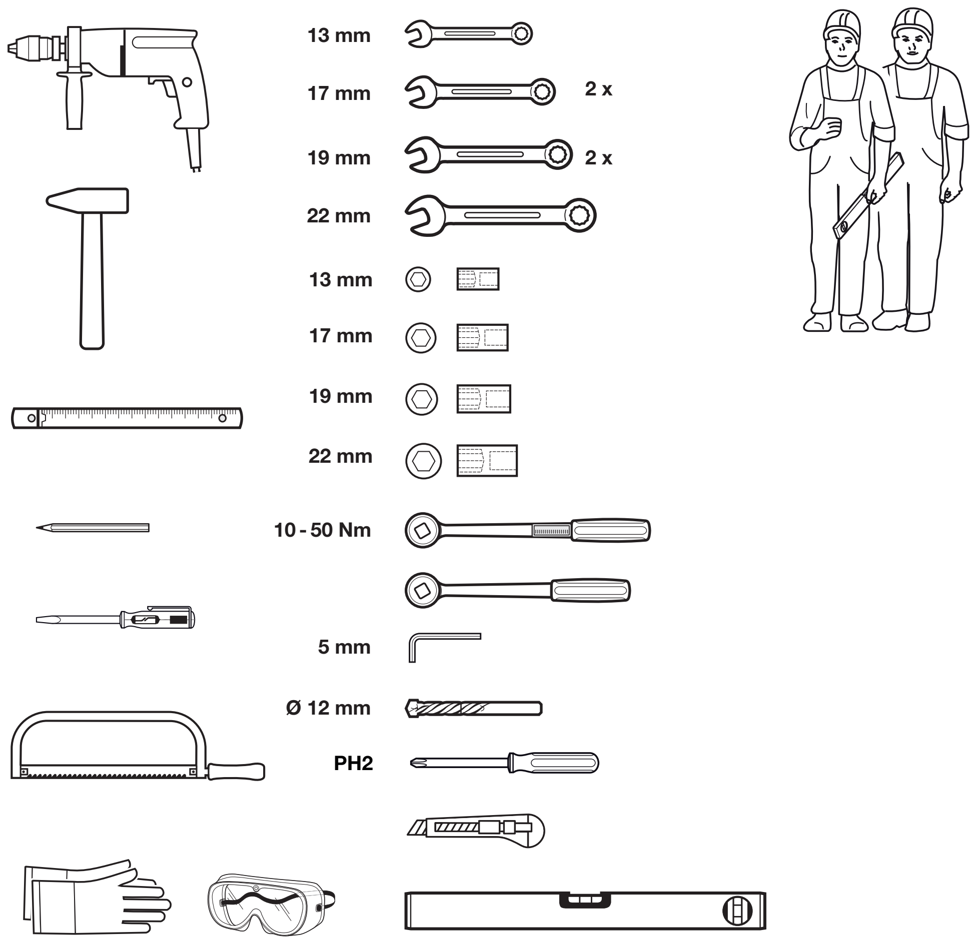








B


13 mm
17 mm
2 x
19 mm
2 x
22 mm
13 mm
17 mm
19 mm
22 mm
10 - 50 Nm
5 mm
Ø 12 mm
PH2

Contents

* Accessory, not included as standard equipment.

Dear Customer,
We thank you for choosing a quality product from our company.

1 About these instructions

These instructions are **original operating instructions** as outlined in EC Directive 2006/42/EC.
These instructions contain important information on the product.

- These instructions contain important information on the product.
- Read through all of the instructions carefully.
- Observe the notices. Pay particular attention to the safety instructions and warnings.
- Keep these instructions in a safe place for later reference.
- Make sure that these instructions are available to the user at all times.

1.1 Warnings used

The general warning symbol indicates a danger that can lead to **injury** or **death**. In the text, the general warning symbol will be used in connection with the caution levels described below. In the illustrated section, an additional instruction refers back to the explanation in the text section.

⚠ DANGER

Indicates a danger that immediately leads to death or serious injuries.

⚠ WARNING

Indicates a danger that can lead to death or serious injuries.

⚠ CAUTION

Indicates a danger that can lead to minor or moderate injuries.

ATTENTION

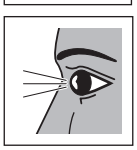
Indicates a danger that can lead to **damage** or **destruction of the product**.

1.2 Symbols used


Important note for avoiding material damage and personal injury


Correct arrangement or activity


Non-permissible arrangement or activity

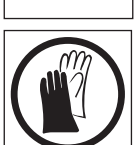

Check / note

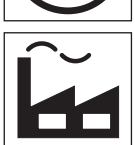

Warning of the barrier

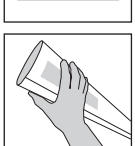

Warning of hand injuries

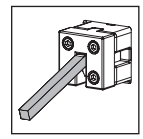

High exertion of force


Check for ease of movement


Use protective gloves


Factory setting


Move barrier boom by hand


Emergency release actuated

▶ See *Section 9.1*

1.3 Definitions

Automatic closing phase	The barrier boom closes automatically when the set time period has elapsed.
Access authorisation system	Component with a simple authorisation check, e.g. radio hand transmitter, electronic code lock, key switch.
Closing loop	Induction loop in the road under the barrier boom for vehicle detection.
Automatic impulse mode	After a travel command, the barrier boom automatically moves to the end-of-travel position.
Normal operation	Normal operation is barrier travel with taught-in travel distances and forces.
Barrier boom	The alarm contact element on barriers that blocks the road.
Barrier boom holder	A connection element connecting the barrier boom to the barrier.

2 ⚠ Safety instructions

⚠ WARNING

Danger of injury due to non-observance of the instructions for fitting, operating and maintenance.

These instructions contain important information on the safe use of the product. Possible dangers are emphasised.

- ▶ Read through all of the instructions carefully.
- ▶ Follow all safety instructions provided in this document!
- ▶ Keep these instructions accessible.

2.1 Intended use

The maximum intensity of use is 500 movement cycles per day. The barrier serves the following purposes:

- Blocking / opening of entrances and exits of car parks or multi-storey car parks.
- Access regulation for vehicles in the private, commercial or industrial sector.

2.2 Non-intended use

The use of the barrier is not permissible:

- In acidic, salty or potentially explosive areas.
- By pedestrians, bicyclists or motorcyclists.

2.3 Further applicable documents

- Operating instructions for the protective device
- Operating instructions for the accessories
- Connection diagrams

2.4 Qualification of personnel

To perform work on the product, the personnel undertaking these tasks must meet certain requirements. The groups of persons are classified as follows:

2.4.1 Operator

The operator is responsible for the physical structure where the product is used. The operator has the following tasks:

- Instructing users.
- Complying with the legal workplace safety rules and regulations.
- Complying with the valid safety, accident prevention and environmental protection regulations.
- Providing and observing documentation.
- Ensuring that the product is always in perfect technical working order.
- Ensure the separation of pedestrian and vehicle traffic with suitable measures. Constructional separations, such as a walkway next to the carriageway, must be complemented by warnings and suitable signs.

2.4.2 Specialist personnel

Specialist personnel is responsible for fitting, initial start-up, maintenance, dismantling and disposal of the product. The following points must be observed:

- Work must only be performed by qualified employees who are familiar with the assembly technology as well as the valid safety regulations.
- Electrical installations must only be performed by qualified electricians.
- For configuration, installation, fitting and operation of the barrier, the standards EN 13241, EN 12604 and EN 12453 as well as the directives and regulations valid at the installation location must be observed and complied with.
- The product must be dismantled and disposed of by qualified employees in accordance with EN 12635.

2.4.3 Users

Users are permitted to perform work for operation and maintenance of the product. Requirements for users:

- Instruction on the product by the operator.
- Knowledge of these instructions.

2.5 Safety instructions for fitting

⚠ WARNING

Danger of injury by unsuitable fixing materials.

▶ See warning *Section 4*

⚠ CAUTION

Crushing hazard by the movement of the barrier.

▶ See warning *Section 6*

ATTENTION

Danger of damage caused by dirt.

▶ See warning *Section 4.4*

2.6 Safety instructions for initial start-up and for operation

⚠ WARNING

Danger of injury due to faulty protective devices.

▶ See warning *Section 8.2*

Danger of injury due to improper setting.

▶ See warning *Section 7*

Danger of injury during barrier travel.

▶ See warning *Section 9*

⚠ CAUTION

Crushing hazard due to barrier travel.

▶ See warning *Section 9*

2.7 Safety instructions for inspection / maintenance

⚠ WARNING

Danger of injury by spring tension.

▶ See warning *Section 10*

Danger of injury due to unexpected barrier boom travel.

▶ See warning *Section 10*

Danger of injury by opening and closing commands of external systems.

▶ See warning *Section 10*

⚠ CAUTION

Hazard of trapping and crushing by the spring tension.

▶ See warning *Section 10*

2.8 Safety instructions for dismantling

⚠ DANGER

Deadly electric shock from mains voltage.

▶ See warning *Section 11*

2.9 Transport and storage

Observe the following during the transport and storage of the barrier / packaging unit:

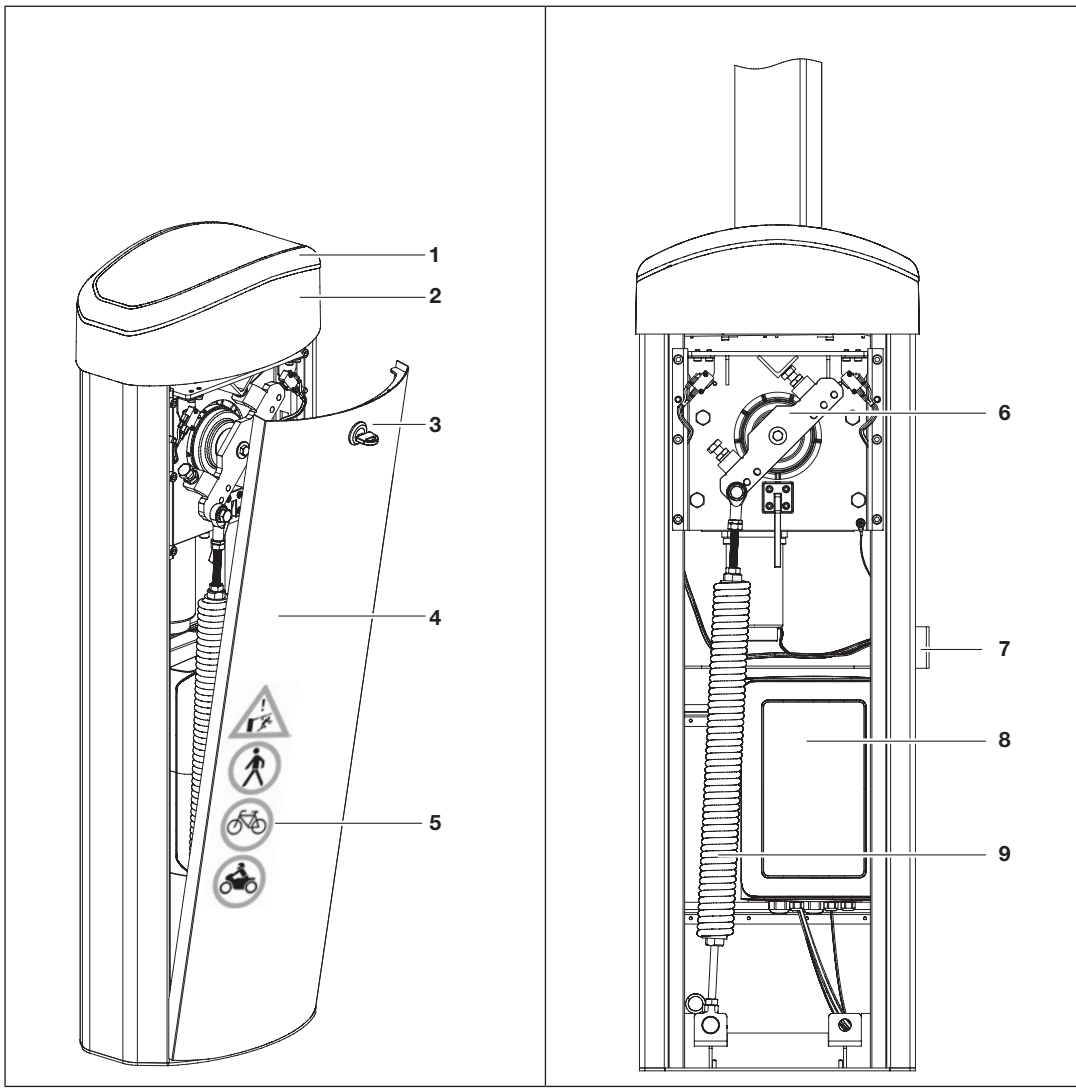
- ▶ Use appropriate lifting equipment for transport.
- ▶ Store the barrier in closed or at least covered and dry areas.
- ▶ Make sure that the barrier / packaging unit is not stacked.
- ▶ Secure the barrier against tipping over and damage.
- ▶ Transport the barrier safely and professionally to the construction site.
  - – Provide loading / transport safety devices.
  - – Transport with low vibration.

3 Product description

Each BS 50 barrier with a minimum protection level of C and D in accordance with DIN EN 12453 must, in addition to force cut-out, be equipped with a protective device (compliant, approved add-on device, e.g. photocell*). This reduces the risk of contact with the barrier boom.

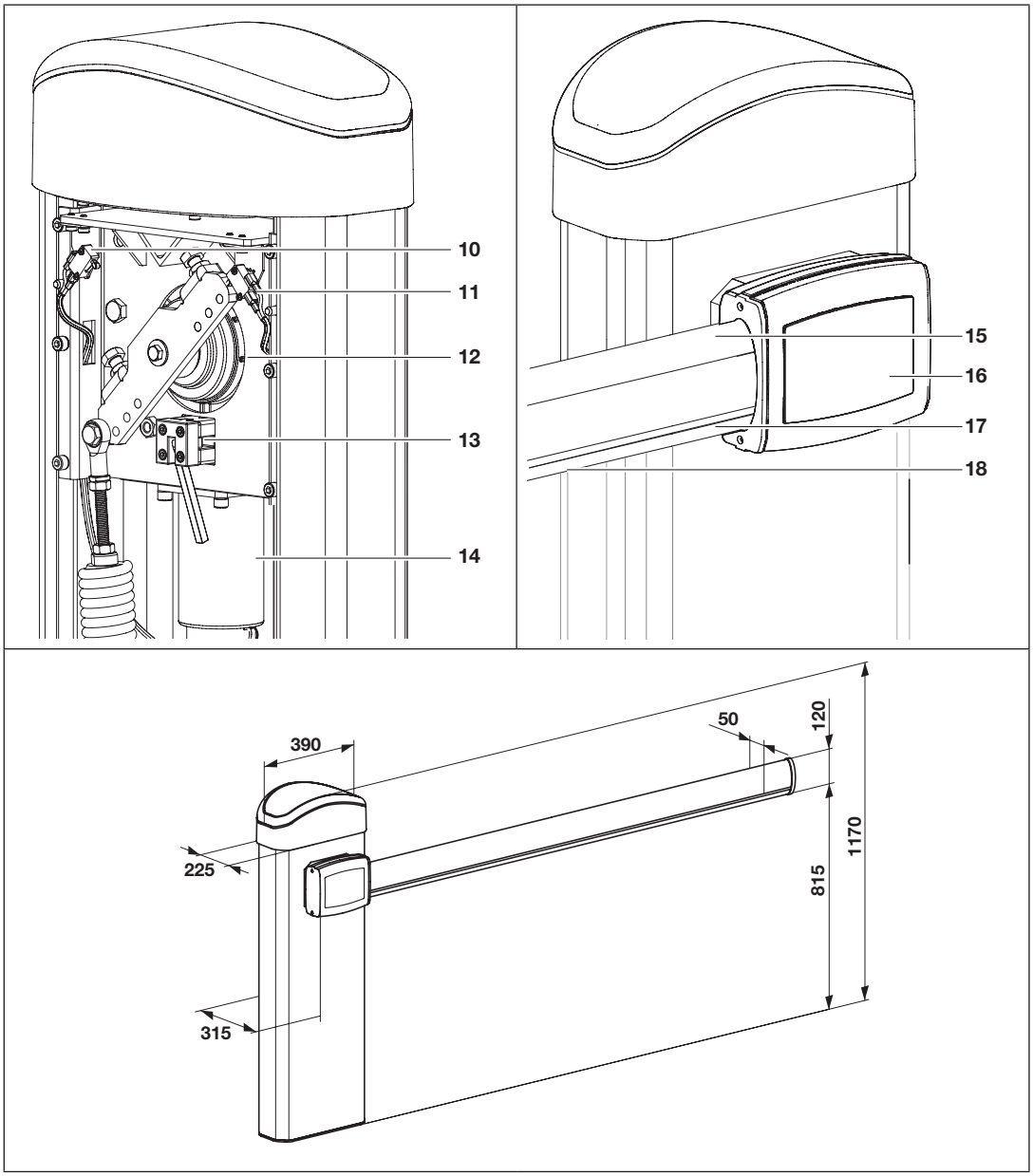
* Accessory, not included as standard equipment.

3.1 Barrier



1 Barrier cover warning light
2 Barrier cover
3 Lock
4 Barrier housing door
5 Warning label
6 Operator lever
7 Protective device / photocell*
8 Barrier control
9 Spring

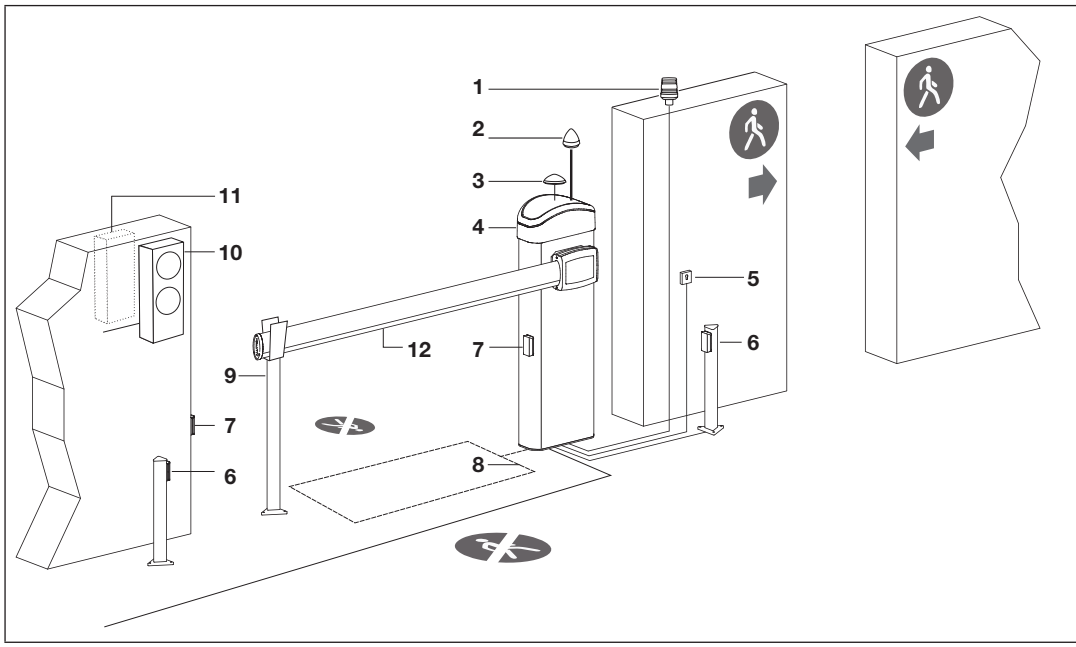
* Accessory, not included as standard equipment.



10 Limit switch
11 Limit switch
12 Operator (gearbox)
13 Lever (emergency release)
14 Operator (24 V motor)
15 Barrier boom
16 Barrier boom holder
17 LED lighting strips*
18 Impact protection

* Accessory, not included as standard equipment.

3.2 Barrier system application example



1 Parking area lighting*
2 Warning light*
3 Radio receiver*
4 Barrier
5 Key switch*
6 Photocell 1*
7 Photocell 2*
8 Induction loop with induction loop detector*
9 Support post*
10 Traffic light 1*
11 Traffic light 2*
12 LED lighting strip*

* Accessory, not included as standard equipment.

4 Fitting

Fitting must only be carried out by qualified specialised personnel.

▶ See *Section 2.4.2*

Fitting must be carried out by 2 persons.

⚠ WARNING

Danger of injury by unsuitable fixing materials.
Use of unsuitable fixing materials may mean that the barrier is insecurely attached and could come loose.

- ▶ Check whether the supplied fixing materials (plugs) are suitable for the intended fitting site.
- ▶ Make sure that only officially approved fixing materials are used.

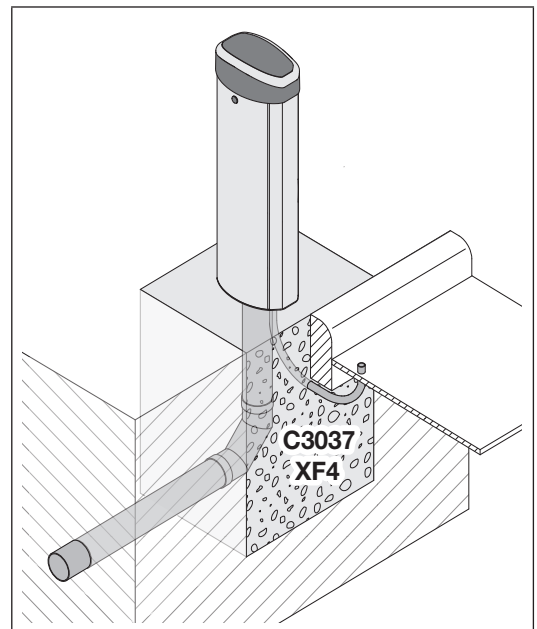
4.1 Foundation requirements

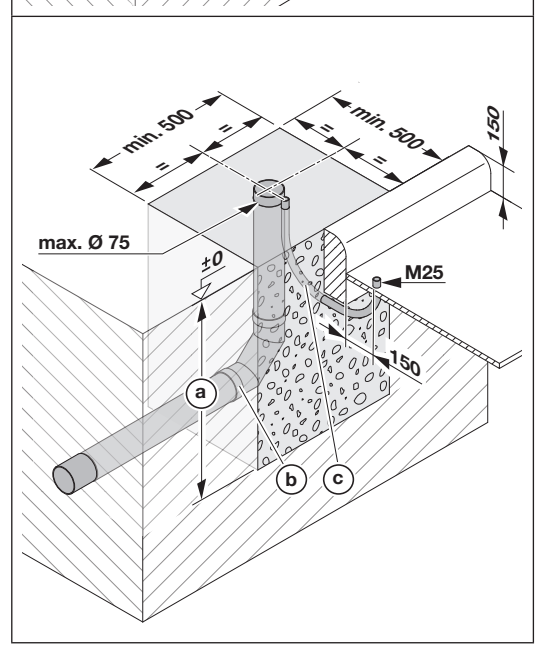
Building material	Concrete
Strength class	C3037 (B35)
Exposition class	XF4
Dimensions	500 × 500 mm
Depth ⓐ	Frost-free depth (in Germany = 800 mm)
Tube ⓑ	Tube for supply and connection cables. To facilitate the passage of the cables, implement the 90° angle with two 45° couplings.
Tube ⓒ	Tube M25 for the induction loop. The tube must be accessible from the road surface.

4.2 Constructing the foundation

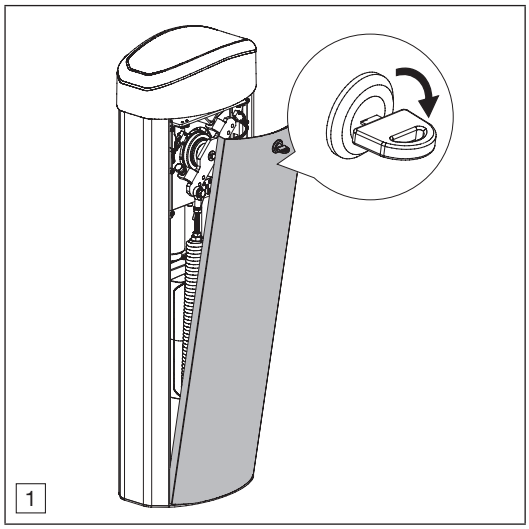
▶ Construct the foundation.

In order for the barrier to be fitted evenly and horizontally, the base area of the foundation must be smoothed (max. 1 mm deviation).





4.3 Opening the barrier housing

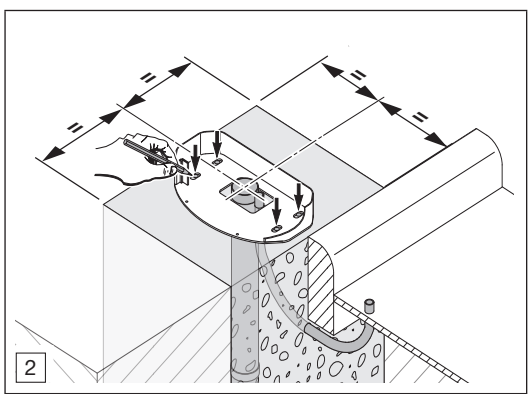


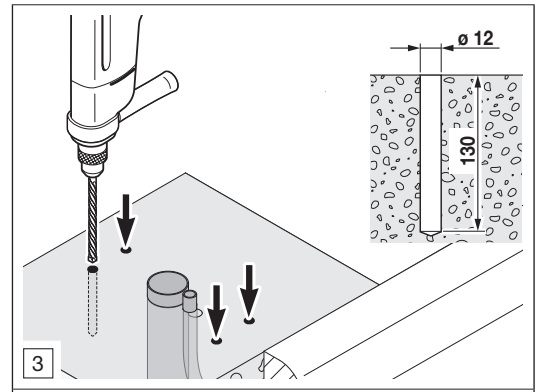
4.4 Fitting the barrier housing

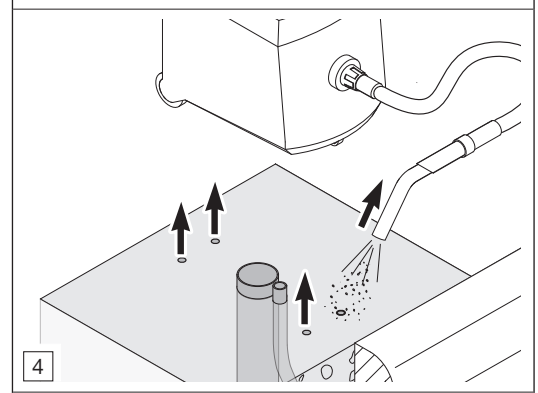
ATTENTION

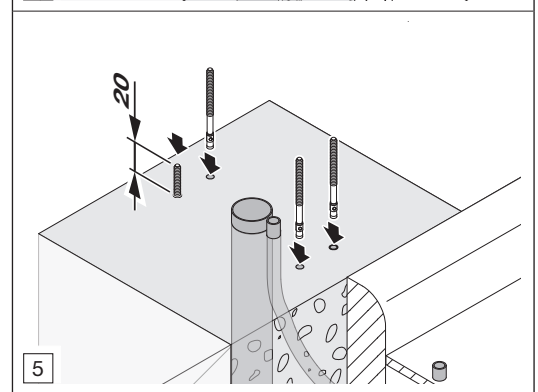
Danger of damage caused by dirt.
Drilling dust and chippings can lead to malfunctions.
▶ Cover the complete barrier during drilling works.

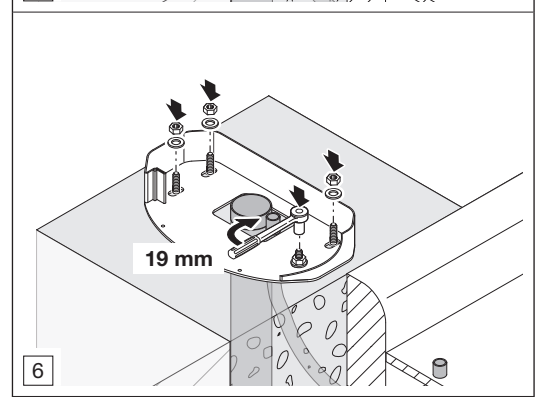
NOTE
The foundation must be hardened before fitting the barrier housing.

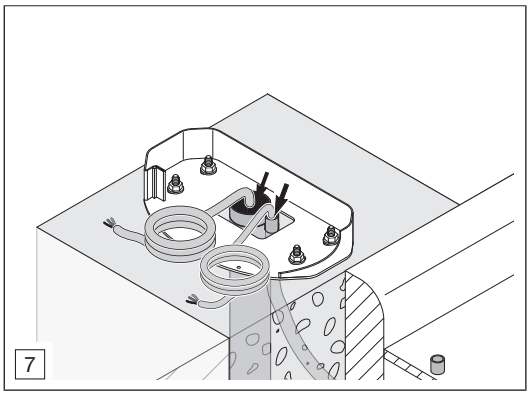








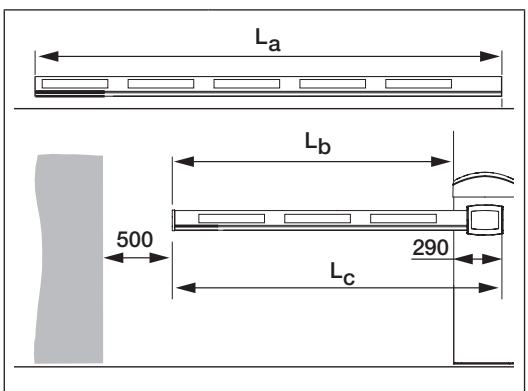




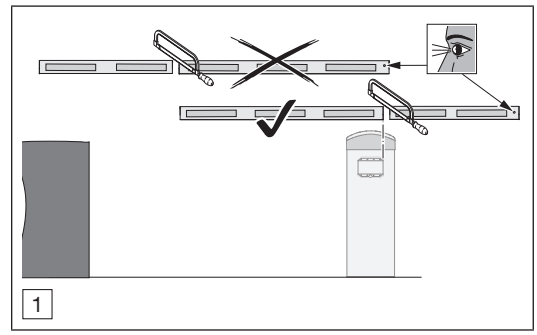
- ▶ Check the cable length.
  Cable length from the surface of the foundation: 2 m
- ▶ Professionally implement the sealings to protect the barrier against humidity and insects:
  – The cable duct (tube) must be sealed in the barrier housing, e.g. using well sealing foam.

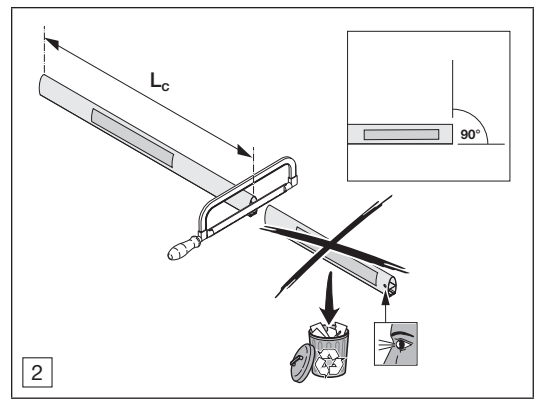
4.5 Preparing the barrier boom

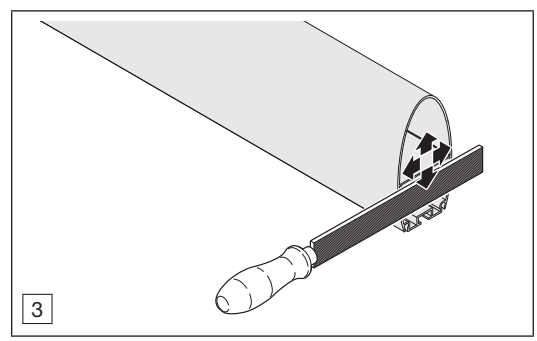
- ▶ Determine the required barrier width.

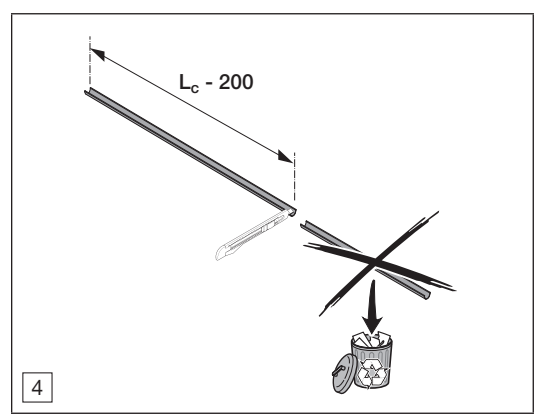


L_a	Standard length (3000 / 4000 / 5000 mm)
L_b	Barrier width
$L_c = L_b + 290$ mm	Shortened length
The minimum distance from fixed objects must be at least 500 mm in accordance with ASR A1.7. From a barrier width > 4 m, a support post* should be used to support the barrier boom.	

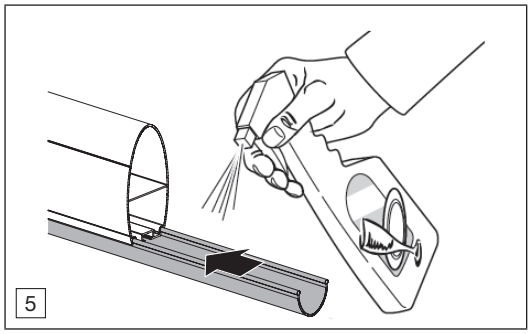


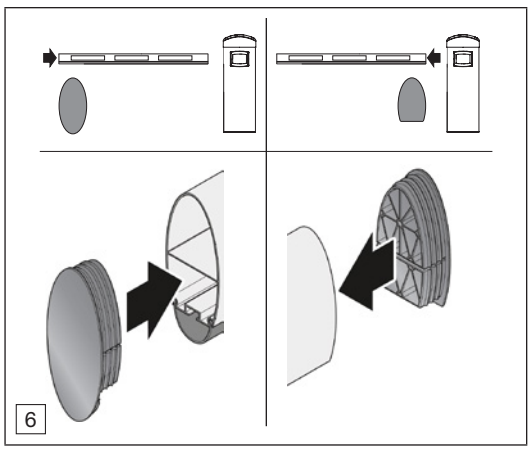






* Accessory, not included as standard equipment.





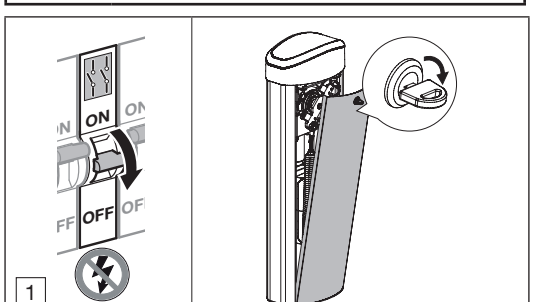
4.6 Barrier boom fitting

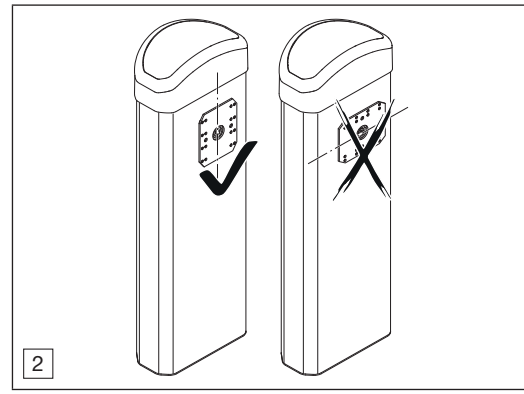
NOTE

If the barrier is used in left-hand operation, the operator has to be altered **before fitting** the barrier boom.

▶ See *Section 15.1*

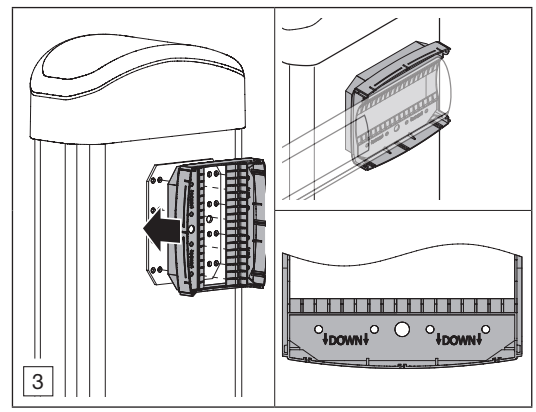
	⚠ CAUTION
	Hazard of trapping and crushing by the spring tension.
When fitting the barrier boom, there is a hazard of trapping and crushing. ▶ Wear protective gloves.	



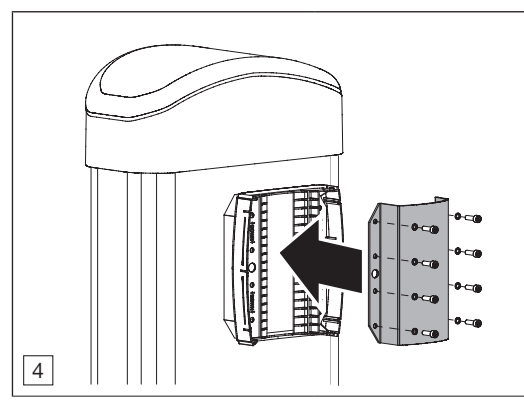


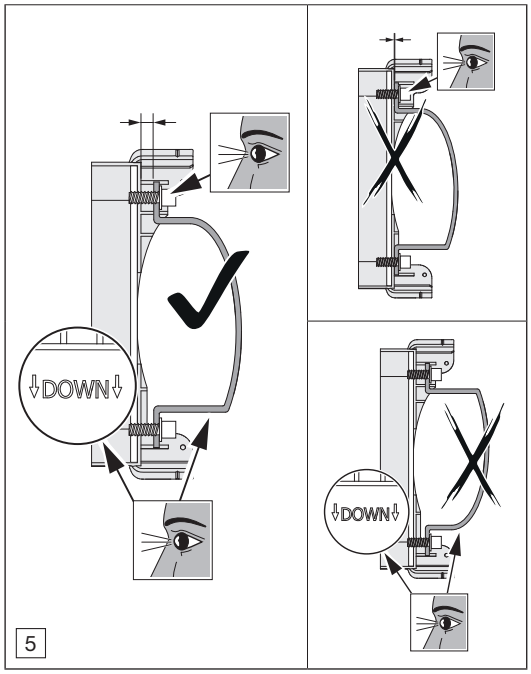
Prerequisites:

- The barrier housing is open.
- The retaining plate console for the barrier boom holder is in the OPEN end-of-travel position. The spring must be relaxed.

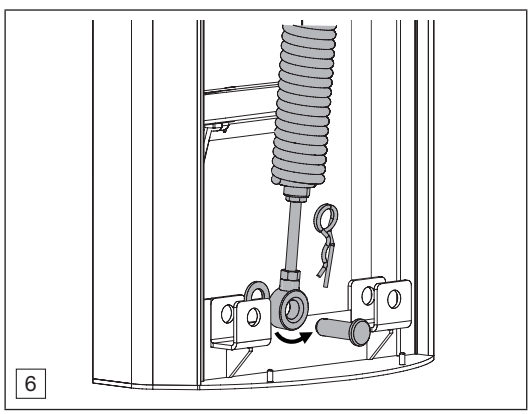


▶ Put the cover on the correct side.

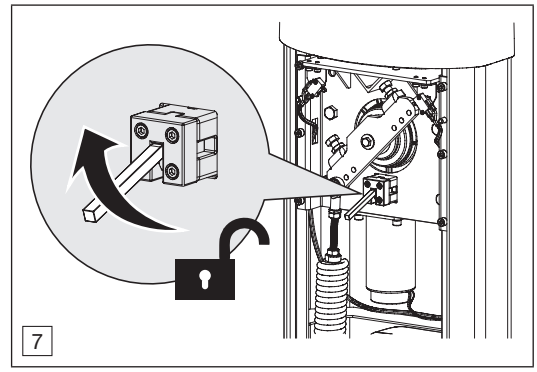




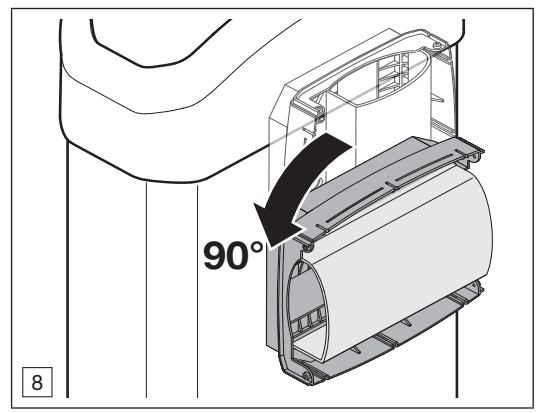
▶ Fix the barrier boom holder. Only tighten the screws by a few rotations.



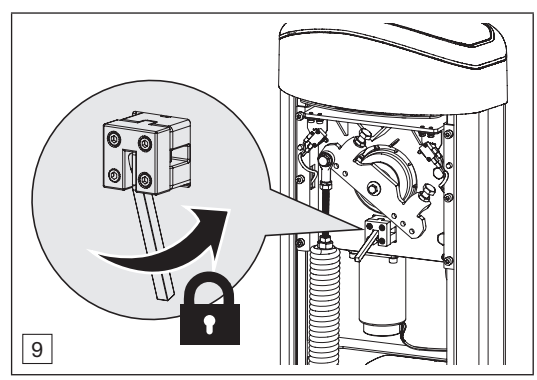
▶ Loosen the bottom fixing point of the spring. The spring must be fully relaxed. If the spring is not fully relaxed, see *Section 4.9.3*.



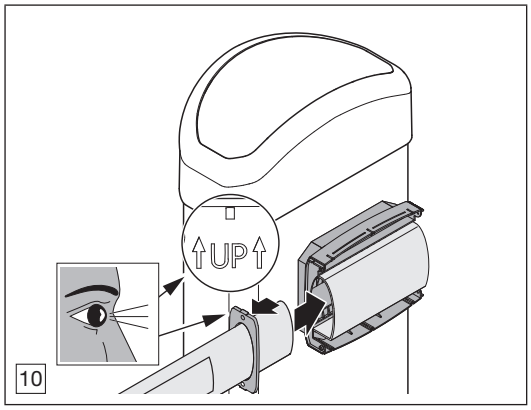
▶ See *Section 9.1*

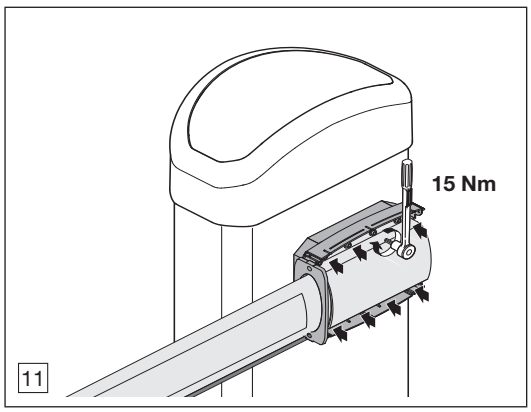


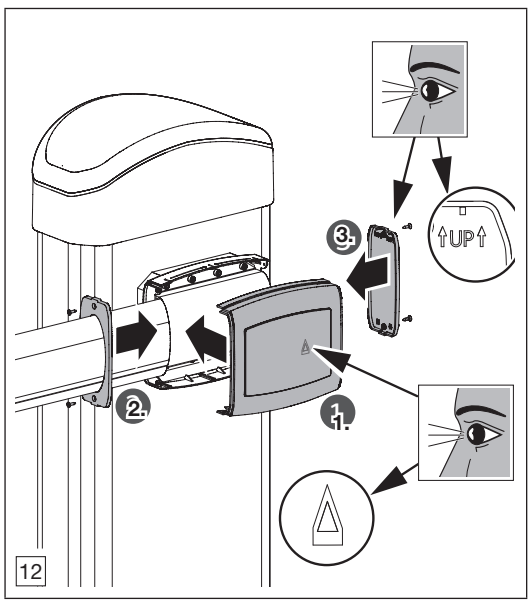
▶ Move the barrier boom holder to the CLOSE end-of-travel position.

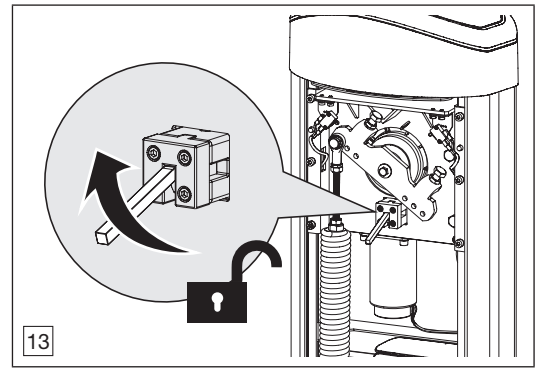


▶ See *Section 9.1*

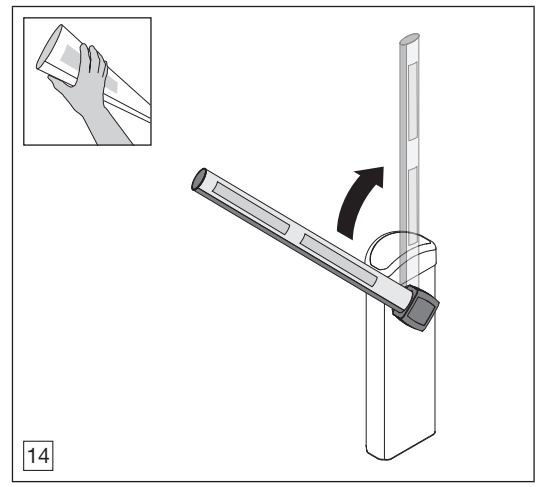




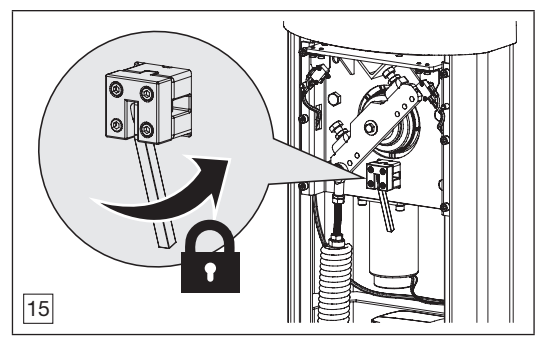




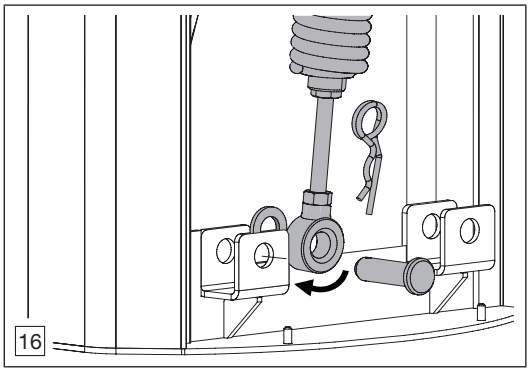
▶ See *Section 9.1*



▶ Move the barrier boom to the OPEN end-of-travel position by hand.



▶ See *Section 9.1*

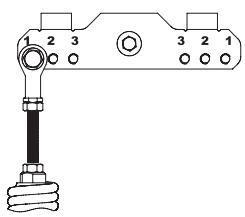
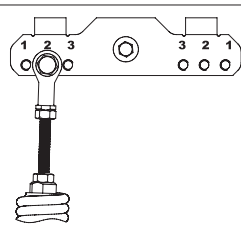
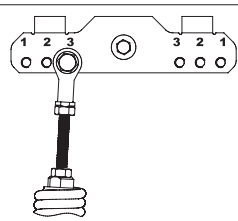


▶ Fix the spring at the bottom fixing point.

4.7 Checking the fixing of the spring

The operator lever has 3 fixing positions for the spring. The fixing position depends on the length of the fitted barrier boom.

▶ Using the table, check whether the spring has to be fixed to another fixing position on the operator lever.

Length Barrier boom	Fixing position	
5 m		1
4 m – 4.99 m		2
3 m – 3.99 m		3

4.8 Changing the fixing of the spring

Precondition

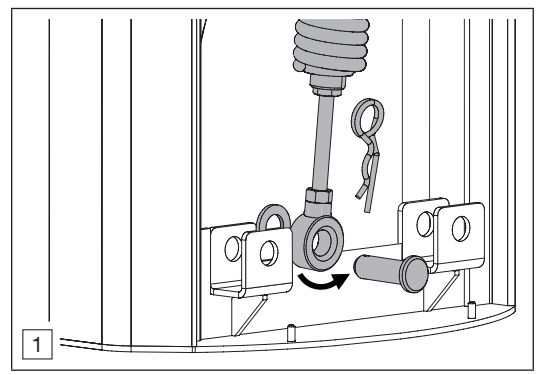
- The barrier boom is in the OPEN end-of-travel position.

⚠ CAUTION

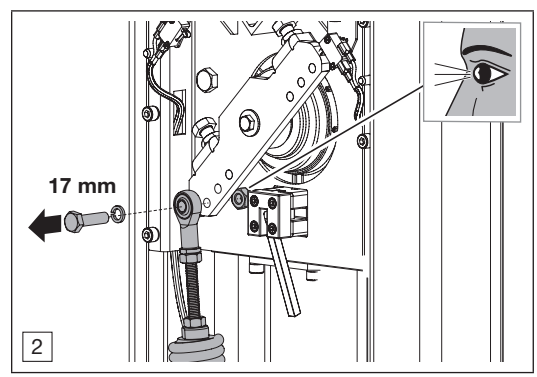
Hazard of trapping and crushing by the spring tension.

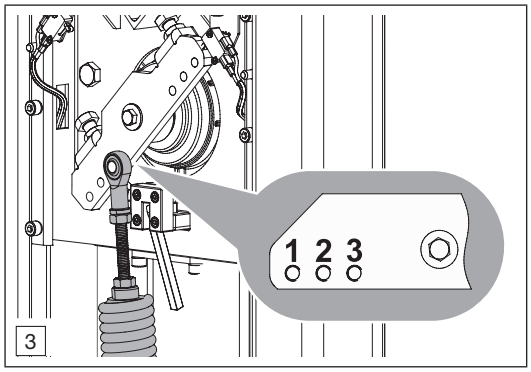
When working on the spring, there is a hazard of trapping and crushing on the spring and inside the barrier housing.

▶ Wear protective gloves.

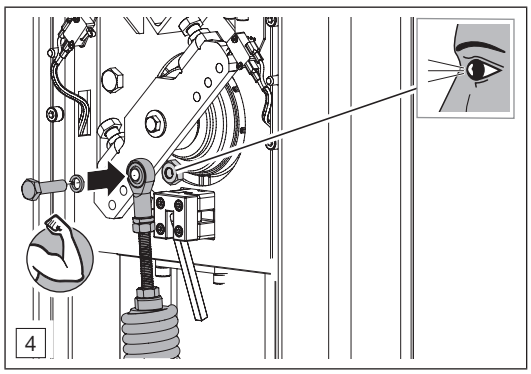


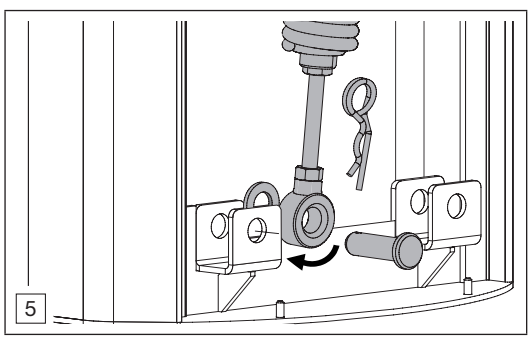
▶ Loosen the bottom fixing point of the spring. The spring must be fully relaxed. If the spring is not fully relaxed, see *Section 4.9.3*.





▶ Select the appropriate fixing position based on the table.



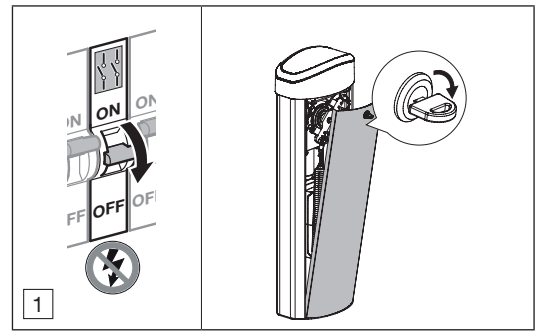


4.9 Counterbalancing the barrier boom

For safe, technically correct operation, the barrier boom must be counterbalanced. The barrier boom must be counterbalanced under the following conditions:

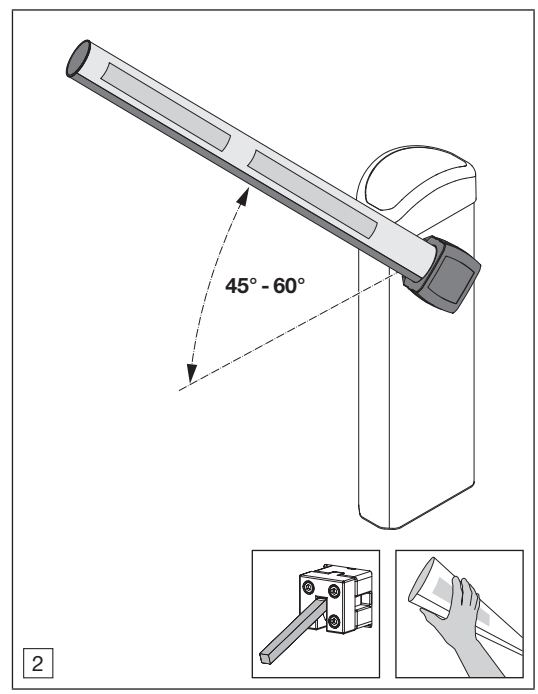
- During initial start-up of the barrier.
- When replacing the barrier boom.
- When fitting a shorter or longer barrier boom.
- When replacing the spring.
- In case of other technical requirements.

4.9.1 Checking the balance of the barrier boom



Prerequisites

- The barrier boom is fitted.
- The fixing position of the spring on the operator lever is correct.
  ▶ See *Section 4.7*
- The emergency release is actuated.
  ▶ See *Section 9.1*



▶ Move the barrier boom to the CLOSE end-of-travel position by hand, then release the barrier boom.
▶ Test the barrier boom behaviour.

Behaviour in case of correct balance	Behaviour in case of incorrect balance
The barrier boom moves from the CLOSE end-of-travel position to a position between 45° - 60° and settles in there. **This process must take place at a slow speed.**	The barrier boom moves from the CLOSE end-of-travel position to the OPEN end-of-travel position at a quick speed.
The barrier boom can be moved by hand to the OPEN end-of-travel position (45° to 90°) with minimal force.	Greater force is required to move the barrier boom from the 45° position to the OPEN or CLOSE end-of-travel positions by hand.
The barrier boom can be moved by hand to the CLOSE end-of-travel position (45° to 0°) with minimal force.	
NOTE All the points named must apply.	**NOTE** If one of the following points applies, the barrier boom is not balanced.

4.9.2 Setting the balance of the barrier boom

The balance of the barrier boom is set by changing the spring tension.

⚠ CAUTION

Hazard of trapping and crushing by the spring tension.

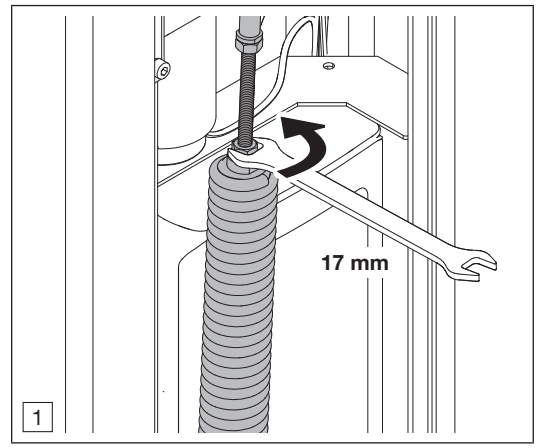
When working on the spring, there is a hazard of trapping and crushing on the spring and inside the barrier housing.

▶ Wear protective gloves.

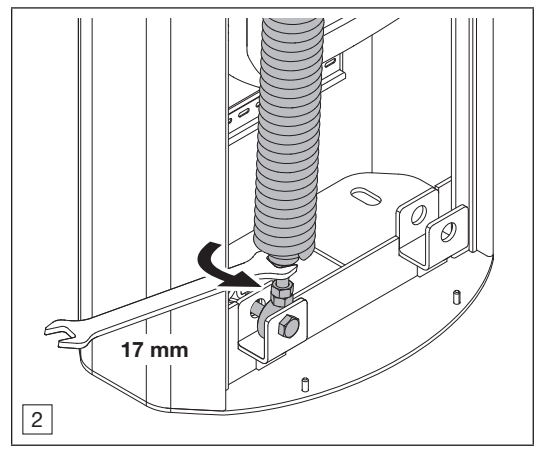
4.9.3 Changing the spring tension

Precondition

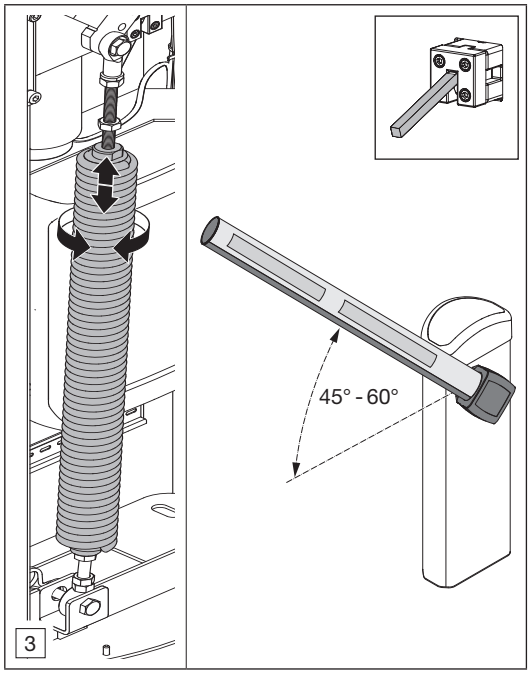
- The barrier boom is in the OPEN end-of-travel position.



▶ Loosen the top nut of the spring.



▶ Loosen the bottom nut of the spring.

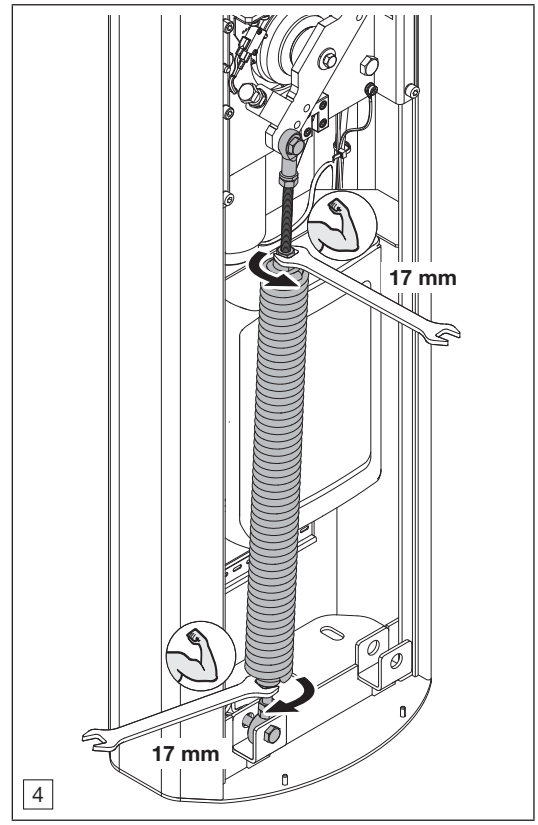


When both nuts are loose, the spring tension can be increased or decreased by turning on the spring.

- ▶ Actuate the emergency release.
- ▶ Move the barrier boom **to the 45° position by hand.**
- ▶ Next, release the barrier boom and test the barrier boom behaviour.

Barrier boom behaviour	**Spring adjustment**
The barrier boom settles in between 45° – 60°.	No adjustment required, the spring tension is correct.
The barrier boom moves very close to the CLOSE end-of-travel position.	▶ Increase the spring tension.
The barrier boom moves very close to the OPEN end-of-travel position.	▶ Reduce the spring tension.

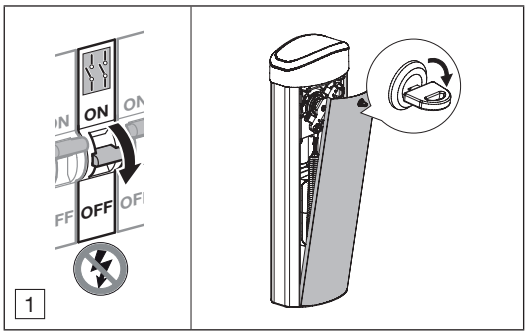
- ▶ Then, check the balance of the barrier boom again.
  - ▶ See *Section 4.9.1*



- ▶ After finishing adjusting, tighten the two nuts again.
- ▶ Close the barrier housing.
- ▶ Switch the mains voltage of the barrier on.
- ▶ Perform a function check.
  - ▶ See *Section 8.2*
- ▶ Start up the barrier.

4.10 End-of-travel positions of the barrier boom

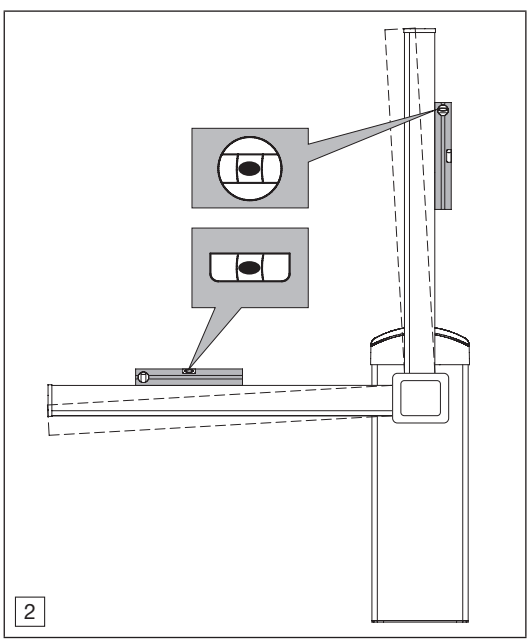
The end-of-travel positions have to be adjusted if the barrier boom is not correctly aligned in the OPEN and CLOSE end-of-travel positions.



Prerequisites

- The barrier boom is fitted.
- The spring is fitted and adjusted.
- The barrier boom is counterbalanced.
- The emergency release is actuated.
  - ▶ See *Section 9.1*

4.10.1 Checking the barrier boom end-of-travel positions



4.10.2 Adjusting the barrier boom end-of-travel positions

⚠ CAUTION

Hazard of trapping and crushing by the spring tension.

When adjusting the end-of-travel positions of the barrier boom, there is a hazard of trapping and crushing.

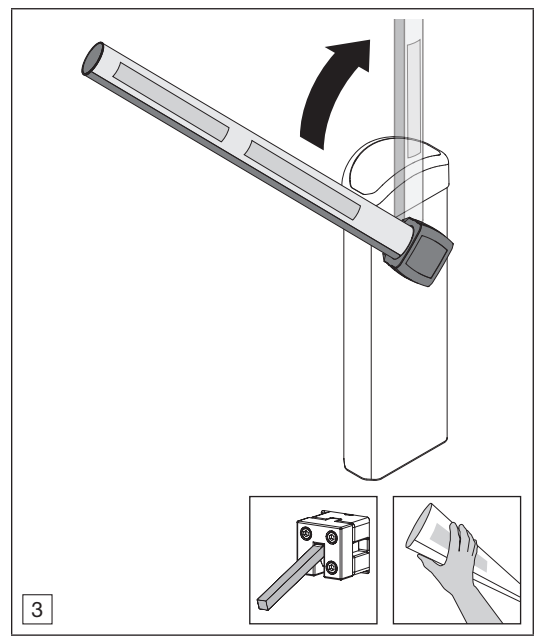
- ▶ Wear protective gloves.

⚠ CAUTION

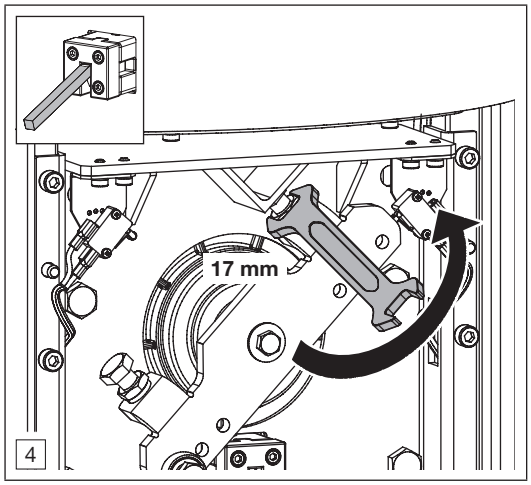
Danger of injury due to actuated emergency release

When the emergency release is actuated, there is a risk of an uncontrolled barrier boom movement to the CLOSE end-of-travel position.

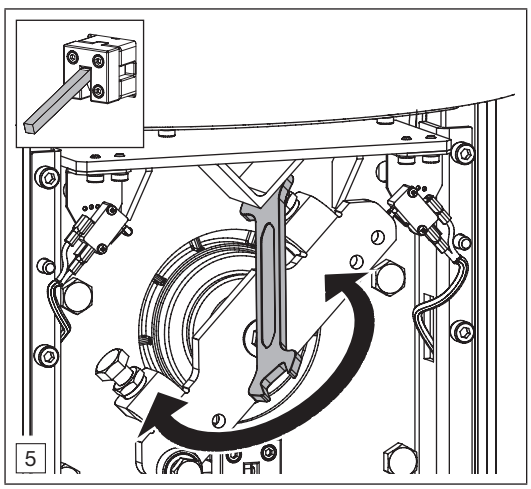
- ▶ Secure the barrier boom against uncontrolled closing by having a second employee fix the barrier boom.



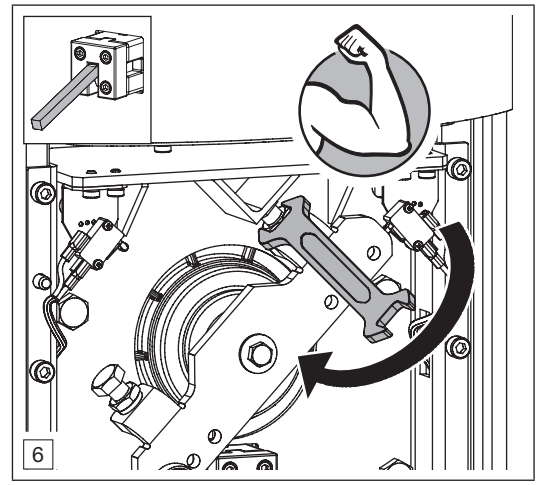
- ▶ Move the barrier boom to the OPEN end-of-travel position by hand. The spring is now relaxed.
- ▶ Secure the barrier boom against uncontrolled closing.



- Loosen the nut.



- Turn the adjusting screw to set the barrier boom's OPEN end-of-travel position.
- Then, check the barrier boom's changed OPEN end-of-travel position.



- Finally, tighten the nut.

NOTE
Repeat the entire adjustment process for the CLOSE end-of-travel position.

- Once you've finished making adjustments, reset the emergency release.
  - ▶ See *Section 9.1*
- Switch the mains voltage of the barrier on.
- Perform a function check.
  - ▶ See *Section 8.2*
- Start up the barrier.

5 Installation

Installation must be carried out by qualified specialised personnel.

▶ See *Section 2.4.2*

Electrotechnical work must only be performed by qualified electricians.

▶ See *Section 2.4.2*

⚠ DANGER

Deadly electric shock from mains voltage.

Contact with the mains voltage presents the danger of a deadly electric shock.

- ▶ Electrical connections may only be made by a qualified electrician.
- ▶ Make sure that the on-site electrical installation conforms to the respective, applicable protective regulations (230 /240 V AC, 50 / 60 Hz).
- ▶ Ensure that an all-pole mains isolator switch with corresponding pre-fuse is available on site.
- ▶ Make sure that a damaged mains connection cable is exchanged by a qualified electrician.
- ▶ Before all electrical work on the barrier, switch off the all-pole mains isolator switch.
- ▶ Secure the all-pole mains isolator switch against being switched on again without authorisation.

ATTENTION

Danger of functional defects.

Connection cables and supply cables laid together can result in malfunctions.

- ▶ Lay the connection cables (24 V DC) and supply lines (230 / 240 V AC) in separate installation systems.

ATTENTION

Danger of material damage.

External voltage on the connecting terminals of the control will destroy the electronics. Mains voltage (230 / 240 V AC) may only be connected to approved connecting terminals / contacts.

▶ See *Section 5.2.2*

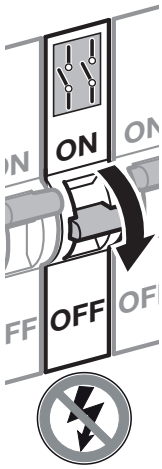
5.1 Connection to the mains voltage

The on-site connecting voltage must match the voltage information on the data label of the barrier.

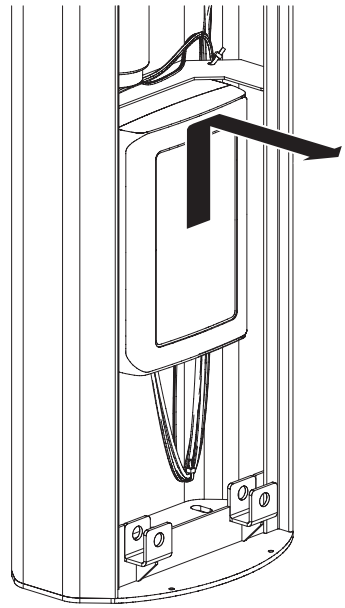
- ▶ Check via a written proof that the mains lead and the protection comply with the valid regulations. If no written proof is available, you must check whether the valid regulations for the on-site mains lead were complied with.
- ▶ Document this check.
- ▶ Open the barrier housing.
- ▶ Attach the mains lead to the terminals.

After connecting the barrier to the mains lead, an electrical test according to the applicable regulations must be carried out.

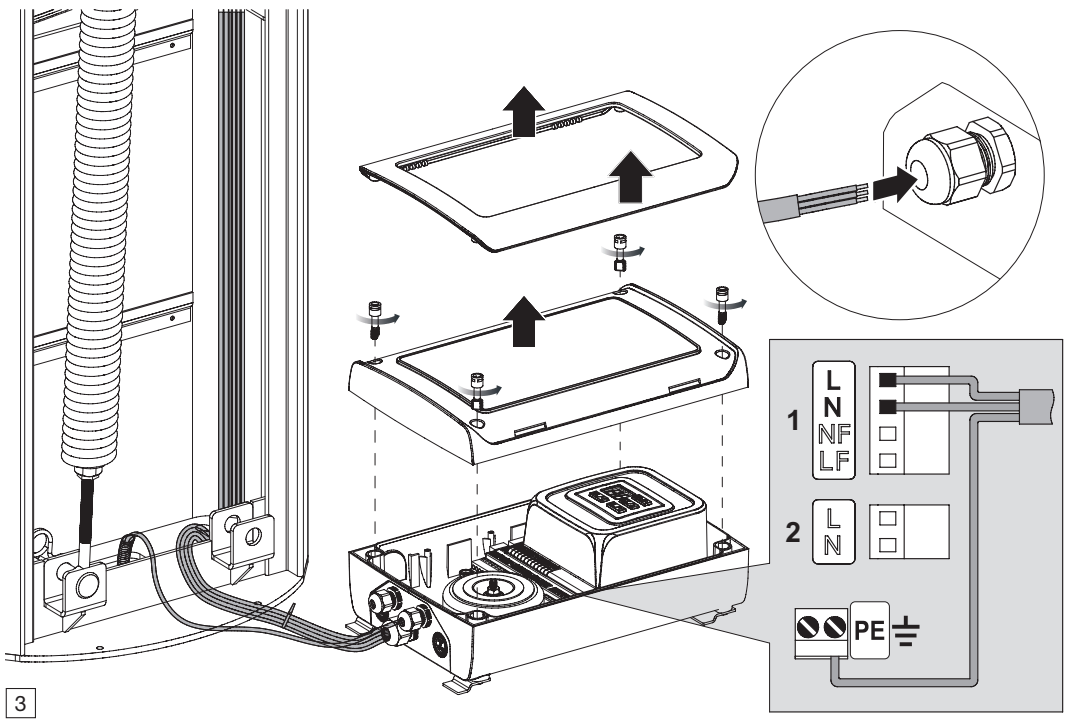
Connection to the mains voltage



1



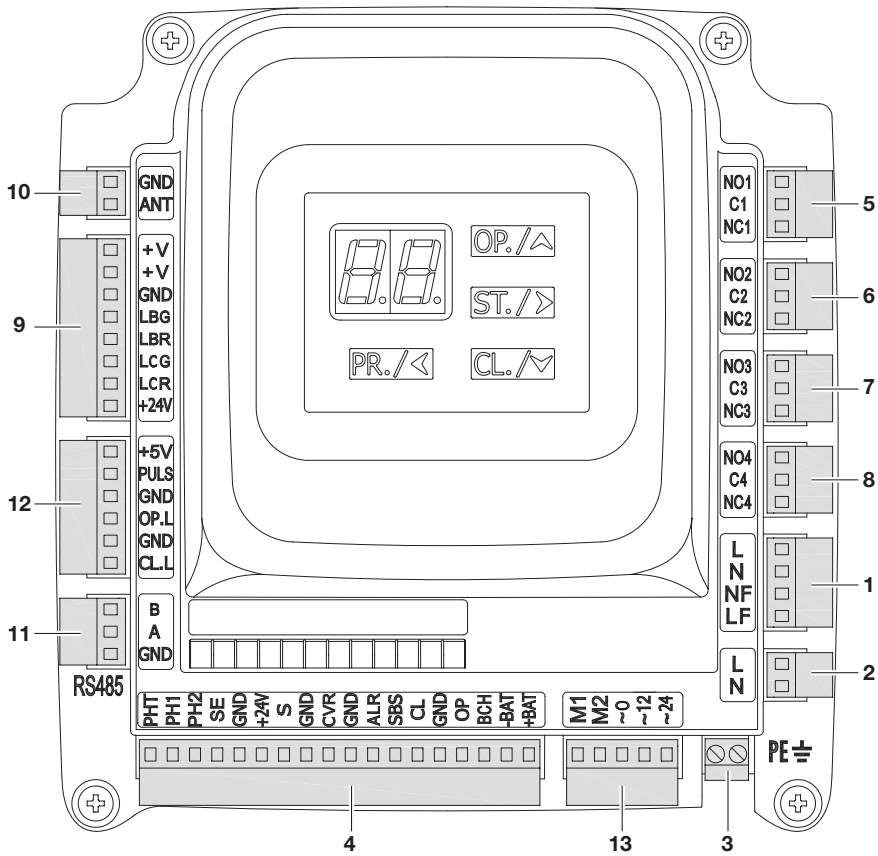
2



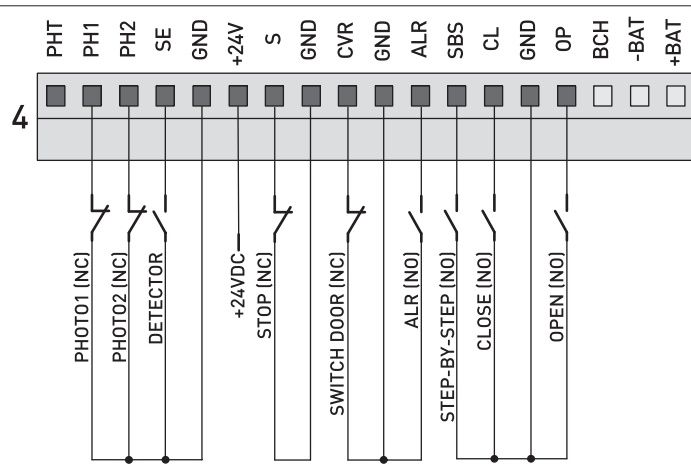
3

5.2 Barrier control

5.2.1 Connections



Connection 4 - factory setting of the contacts



5.2.2 Connecting terminals

- The connecting terminals can have multiple assignments.
- Signal input function: Contact × on GND = input wired.

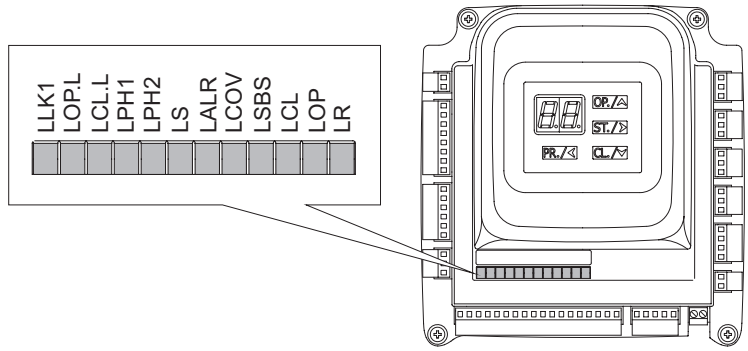
Connection	Plug	Contact	Description	
1	4-pin	L	Mains voltage 230 V / 50 Hz	 ▶ See *Section 5.1*
		N	Mains voltage 230 V / 50 Hz	
		NF	Transformer connection 230 V / 50 Hz	
		LF	Transformer connection 230 V / 50 Hz	
2	2-pin	L	230 V / 50 Hz for optional extras max. 3 A	
		N	230 V / 50 Hz for optional extras max. 3 A	
3	2-pin	PE	Earth conductor	
		PE	Earth conductor	
4	18-pin	+ BAT	No function	
		- BAT	No function	
		- BCH	No function	
		OP	Open barrier (signal input). After an impulse / travel command, the barrier boom moves to the OPEN end-of-travel position.	▶ See *Section 7*, menu P3-F1 / menu P3-F3 / menu P3-F8
		GND	Reference potential for all signal voltages of connection 4. Contact on GND = signal input wired.	
		CL	Close barrier (signal input). After an impulse / travel command, the barrier boom moves to the CLOSE end-of-travel position.	▶ See *Section 7*, menu P3-F1 / menu P3-F8
		SBS	Impulse sequence control (signal input)	▶ See *Section 7*, menu P3-F3 / menu P3-F8
		ALR	Open / close barrier permanently (signal input). A static signal at the signal input moves the barrier boom to the OPEN end-of-travel position or, depending on the settings, to the CLOSE end-of-travel position.	▶ See *Section 7*, menu P7-F5
		CVR	Barrier door switch (signal input). If the barrier door is open, external travel commands are not executed.	▶ See *Section 7*, menu P3-F1
		S	Stop barrier (signal input). S on GND = Travel commands are executed. S not on GND = Travel commands are not executed or stopped.	
		+24 V	Supply voltage for external devices	24 V DC / 250 mA.
		SE	Induction loop detector* for vehicle detection / signal input	▶ See *Section 7*, menu P7-F4
		PH2	Photocell 1* (signal input)	▶ See *Section 7*, menu P7-F5
		PH1	Photocell 2* (signal input)	▶ See *Section 7*, menu P7-F5
		PHT	Self-testing of the photocell(s)* (switching output)	▶ See *Section 7*, menu P7-F5

* Accessory, not included as standard equipment.

Connection	Plug	Contact	Description	
5	3-pin	NO1 C1 NC1	Relay, volt-free 230 V AC / 3 A (switching output)	▶ See *Section 7.9*, menu P3-F4
6	3-pin	NO2 C2 NC2	Relay, volt-free 230 V AC / 3 A (switching output)	▶ See *Section 7.9*, menu P3-F5
7	3-pin	NO3 C3 NC3	Relay, volt-free 230 V AC / 3 A (switching output)	▶ See *Section 7.9*, menu P3-F6
8	3-pin	NO4 C4 NC4	Relay, volt-free 230 V AC / 3 A (switching output)	▶ See *Section 7.9*, menu P3-F7
9	8-pin	+V	Supply voltage 24 V DC for LED lighting strip*	
		GND	GND for LED lighting strip*	
		LBG	Green LED lighting strip* (switching output)	▶ See *Section 7*, menu P8-F2 / menu P8-F5 / menu P8-F6
		LBR	Red LED lighting strips* (switching output)	
		LCG	Green barrier cover warning light (switching output)	
		LCR	Red barrier cover warning light (switching output)	
		+24 V	Supply voltage for barrier cover warning light	
10	2-pin	GND	No function	
		ANT	No function	
11	3-pin	B	COM1 / RS485 for barrier synchronous operation	▶ See *Section 15.2*
		A	COM1 / RS485 for barrier synchronous operation	
		GND	GND / RS485	
12	6-pin	+5 V	Operator encoder	
		PULS		
		GND		
		OP.L	Limit switch - OPEN barrier boom end-of-travel position (Signal input)	
		GND	Limit switch / GND	
		CL.L	Limit switch - CLOSE barrier boom end-of-travel position (Signal input)	
13	5-pin	~24	Barrier control supply voltage	24 V AC
		~12	Barrier control supply voltage	12 V AC
		~0	Barrier control supply voltage	
		M2	Operator supply voltage	
		M1		

* Accessory, not included as standard equipment.

5.2.3 Diagnosis LED



LED designation	Connection	Contact	Explanation
LLK1	5 6 7 8	NO NC	Switching output 5 / 6 / 7 / 8 active
LOP.L	12	OP.L	Limit switch OPEN
LCL.L	12	CL.L	Limit switch CLOSE
LPH2	4	PH2	Protective device / photocell* 2
LPH1	4	PH1	Protective device / photocell* 1
LS	4	S	Barrier boom travel - STOP
LALR	4	ALR	Barrier boom permanently in the OPEN end-of-travel position / CLOSE end-of-travel position
LCOV	4	CVR	Barrier door switch
LSBS	4	SBS	Impulse sequence operation
LCL	4	CL	Close barrier
LOP	4	OP	Open barrier
LR	-	-	No function

* Accessory, not included as standard equipment.

6 Initial start-up

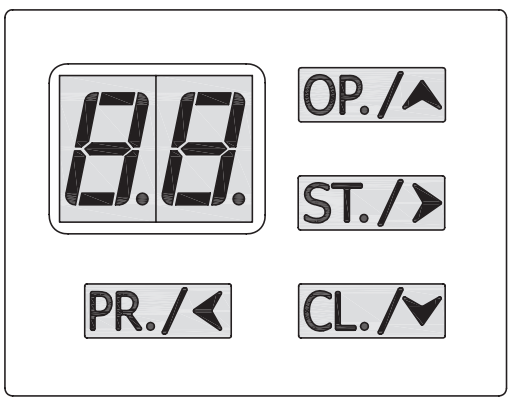
Initial start-up must be carried out by qualified specialised personnel.

▶ See *Section 2.4.2*

	**⚠ CAUTION**
	Crushing hazard due to barrier travel.
During barrier travel, there can be areas with crushing hazard between the barrier housing and barrier boom. ▶ Do not reach in between the barrier housing and barrier boom during barrier travel.	

▶ Open the barrier housing.
▶ Open the barrier control housing.
▶ Switch the mains voltage of the barrier on. Device and status information are shown on the display of the barrier control.

6.1 Operation



6.2 Buttons

	Function	Information
PR./◀	Open the menu settings (*Section 7*).	▶ Press the button for 5 seconds.
	Close the menu settings (*Section 7*).	▶ Press the button multiple times until a dot is shown on the display.
OP./▲	Scroll up	In manual operation: Open barrier.
CL./▼	Scroll down	In manual operation: Close barrier.
ST./▶	Confirm selection	

NOTE

If the barrier housing door is open, the barrier boom travels to the OPEN / CLOSE end-of-travel position at a very slow speed.

If the barrier housing door is closed, the settings in the *Section 7.5.3* determine the opening / closing speed of the barrier boom.

6.3 Display

Display	Explanation
88.	Standby status (dot shown)
Ab	The length of the barrier boom is not set. ▶ See *Section 7.1.1*, menu P1–F1
OP.	Barrier boom opens.
CL.	Barrier boom closes.
LO	Limit switch barrier OPEN active / signal input OP.L.
LO.	Barrier boom has reached the OPEN end-of-travel position.
LC	Limit switch barrier CLOSE active / signal input CL.L.
LC.	Barrier boom has reached the CLOSE end-of-travel position.
cO	The Open barrier travel command is executed at a delay. Delay time in progress.
cC	The Close barrier travel command is executed at a delay. The delay time is in progress.
cS	Barrier boom travel stopped by stop command.
cA	Open barrier travel command at signal input ALR.
AL	Signal input ALR active.
Au	Automatic closing phase active.
E0	Limit switch error. The limit switches are open / input OP.L and input CL.L.
E1 EF	Obstacle detection active. ▶ See *Section 7.5.2,* menu P5–F3 / menu P5–F4

Display	Explanation
E2	Protective device / photocell* active / signal input PH1 / PH2.
E3	Induction loop detector* is active / signal input SE.
E4	Photocell test* failed. ▶ See *Section 7.1.1*, menu P7–F3
E5	Barrier boom travel stopped / signal input S.
E9	Barrier synchronous operation error. ▶ See *Section 7.8*, menu P9–F1
Et	Operator switched off as the barrier boom did not reach the end-of-travel position within 30 seconds.

6.4 Adjusting the barrier boom length

Prerequisites

- Barrier boom is fitted.
- Spring is fitted and adjusted.
- Barrier boom is counterbalanced.
- Barrier is switched on.

Adjustment

▶ In menu setting P1–F1, set the appropriate value for the fitted barrier boom.
  ▶ See *Section 7.1.1*

7 Menu settings

⚠ WARNING

Danger of injury due to improper setting.
Settings in the menus that change the factory setting may only be made by specialists. Changes made by unqualified persons can cause substantial danger to life and limb.

▶ Contact your specialist dealer if necessary.

7.1 Basic setting / initial start-up

7.1.1 Barrier boom length

Menu	P1
Function	F1
Function setting for the length of the fitted barrier boom. ▶ See section 4.5	
Value	Barrier boom length
no	Not set
3,0	3 m – 3.99 m
4,0	4 m – 4.99 m
5,0	5 m
NOTE If the set value for the barrier boom length is changed, the menus P5 and P6 are automatically reset to the factory setting.	

7.2 Control type

⚠ WARNING

Danger of injury by barrier travel with control type press-and-hold operation.
The control panel for operating the barrier system must be located somewhere that ensures a direct, good view of the barrier system at all times. Make sure that only instructed users operate the barrier system.
▶ See *Section 2.4.3*
Prevent unauthorised persons from having access to the control panel, e.g. by installing a key switch.

* Accessory, not included as standard equipment.

7.2.1 Automatic impulse mode / press-and-hold operation

Menu	P3
Function	F1
Function setting for opening and closing the barrier boom.	
Value	Control type
no	**Automatic impulse mode** **1. Pressing the OP./▲ button opens the barrier boom.** 2. Pressing the CL./▼ button closes the barrier boom. 3. Signal inputs / contacts. An impulse at signal input OP opens the barrier boom. An impulse at signal input CL closes the barrier boom.
on	**Press-and-hold operation** **1. Pressing and holding the OP./▲ button opens the barrier boom.** 2. Pressing and holding the CL./▼ button closes the barrier boom. Releasing the button stops the barrier boom's travel. 3. Signal inputs / contacts. A static signal at input OP opens the barrier boom. A static signal at input CL closes the barrier boom. Switching the static signal off stops the barrier boom's travel.
NOTES If the control type press-and-hold operation is set, the barrier boom travels to the OPEN / CLOSE end-of-travel positions at a very slow speed. Settings for the opening / closing speed in *Section 7.5.3* are ignored. If the barrier door is open, travel commands from signal inputs / contacts OP / CL are not executed.	

7.2.2 Impulse sequence control

Menu	P3
Function	F3
Function setting for signal input SBS and OP. Definition of operating mode in case of impulses at the input.	
Value	Barrier boom behaviour
no	Impulse 1 - OPENS Impulse 2 - STOPS Impulse 3 - CLOSES Impulse 4 - STOPS Impulse 5 - OPENS etc.
on	Impulse 1 - OPENS completely Impulse 2 - CLOSES Impulse 3 - OPENS completely etc. **NOTE** If an impulse is received at the input when travelling to the CLOSE end-of-travel position, the barrier boom reverses.

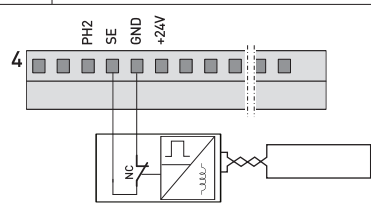
7.3 Signal inputs

7.3.1 Signal inputs SBS and OP

Menu	P3
Function	F8
Function setting for the signal inputs SBS and OP. ▶ For set value 01 and 03, see *Section 7.2.1* ▶ For set value 01 and 02, see *Section 7.2.2*	
Value	Function
01	SBS: Impulse sequence control OP: Open
02	SBS: Impulse sequence control OP: Impulse sequence control
03	SBS: Open OP: Open

7.3.2 Signal input SE

Menu	P7
Function	F4
Function setting for signal input SE (detector) with connected induction loop detector*.	
Value	Function
no	Deactivated
01	**Stop / reverse** Precondition: • The barrier closes and signal input SE reports that a vehicle has been detected. Behaviour of the barrier: • The barrier boom reverses (stops and opens) and waits for further travel commands.
02	**Automatic closing** Precondition: • The barrier closes and signal input SE reports that a vehicle has been detected. Behaviour of the barrier: • The barrier boom reverses (stops and opens) and closes after the vehicle passes.
03	No function
04	No function



7.3.3 Signal input ALR

Menu	P7
Function	F5
Function setting to permanently open / close the barrier boom. A static signal (e.g. from a fire alarm system) moves the barrier boom to the OPEN or CLOSE end-of-travel position. The barrier boom remains in the end-of-travel position as long as the static signal is active.	
Value	Function
OP	Barrier boom remains in the OPEN end-of-travel position permanently.
CL	Barrier boom remains in the CLOSE end-of-travel position permanently.

7.4 Automatic operation / time settings

7.4.1 Automatic closing phase

Menu	P4
Function	F1
Function setting for automatic barrier closing. When the set period of time is up, the barrier boom moves to the CLOSE end-of-travel position.	
Value	Time period
no	Deactivated
01 - 99	01 – 99 seconds
Prerequisites for the barrier to close automatically: • The photocell* reports “free”. • The closing loop* reports “free”. • No opening signal pending. • No system malfunction present. • No signal at input ALR.	
NOTE This function can and may only be used if at least one photocell* with self-testing is connected to the barrier. Self-testing of the photocell(s)* is automatically activated when setting the closing phase. ▶ See *Section 7.7.1*, menu P7-F3-01 ▶ See *Section 7.7.1*, menu P7-F3-02	

* Accessory, not included as standard equipment.

7.4.2 Closing delay

Menu	P4
Function	F2
Delays closing of the barrier boom by the set time value. **NOTE** The Close barrier travel command must be generated by a photocell connected to input PH1 / PH2 that is becoming “free”.	
Value	Closing delay
no	Deactivated
01 - 99	01 – 90 seconds

7.4.3 Opening the barrier boom at a delay

Menu	P7
Function	F6
Function setting to start barrier boom travel to the OPEN end-of-travel position at a delay after a travel command. **NOTE** Required when connecting a magnet or in case of electromechanical locking. ▶ See *Section 7.9.2,* relay function 15 or 16	
Value	Delay time
0.4	400 ms
0.2 – 2	200 ms – 2 seconds

7.5 Force / speed settings

7.5.1 Opening / closing force

⚠ WARNING

Danger of injury resulting from too large force increase.
If the force is set too high, the power limit is less sensitive. The barrier boom does not stop on time when closing. This can lead to injury or damage.
- ▶ Do not set the force too high.
- ▶ Check the set force with suitable force measurement equipment for permissible values within the scope of EN 12453 or the corresponding national regulations.
- ▶ If the measured force is too high, reduce the set value.

Menu	P5
Function	F1
Opening force of the barrier boom when moving to the OPEN end-of-travel position.	
Value	Opening force
99	Maximum
01 - 99	01 minimum – 99 maximum

Menu	P5
Function	F2
Closing force of the barrier boom when moving to the CLOSE end-of-travel position.	
Value	Closing force
99	Maximum
01 - 99	01 minimum – 99 maximum

7.5.2 Obstacle detection

⚠ WARNING

Danger of injury by incorrectly set obstacle detection.
If the obstacle detection is set incorrectly, the power limit is less sensitive. The barrier boom does not stop on time when closing. This can lead to injury or damage.
- ▶ Adjust the obstacle detection to the most sensitive setting possible.
- ▶ Check the force with suitable force measurement equipment for permissible values within the scope of EN 12453 or the corresponding national regulations.
- ▶ If the obstacle detection setting is not sensitive enough, increase the set value.

Menu	P5
Function	F3
Sensitivity of obstacle detection when the barrier boom is moving to the OPEN end-of-travel position.	
Value	Sensitivity
50	Medium
00 - 90	00 minimum – 90 maximum

Menu	P5
Function	F4
Sensitivity of obstacle detection when the barrier boom is moving to the CLOSE end-of-travel position.	
Value	Sensitivity
50	Medium
00 - 90	00 minimum – 90 maximum

7.5.3 Opening / closing speed:

⚠ WARNING

Danger of injury resulting from high force due to high speed.

If the speed is set too high, this can result in greater operating forces than specified in EN 12453. This can lead to injury or damage.

- Do not set the speed too high.
- After adjusting the speed, check the force with suitable force measurement equipment for permissible values within the scope of EN 12453 or the corresponding national regulations.
- If the measured closing force is too high, reduce the speed.

Menu	P6
Function	F1
Speed of the barrier boom when moving to the OPEN end-of-travel position.	
Value	Speed
05	Medium
01 - 09	01 minimum – 09 maximum

Menu	P6
Function	F2
Speed of the barrier boom when moving to the CLOSE end-of-travel position.	
Value	Speed
05	Medium
01 - 09	01 minimum – 09 maximum

7.6 Signalling

7.6.1 Signalling in general

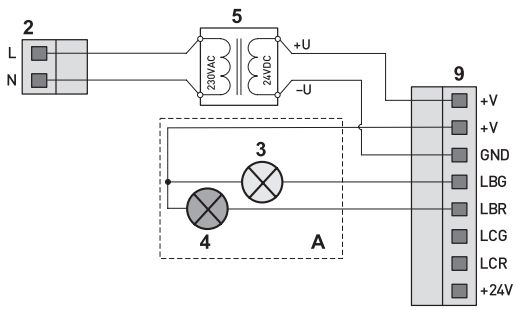
Menu	P8
Function	F6
Function setting for visual signalling.	
Value	Signalling
no	Barrier cover warning light and LED lighting strip* barrier boom switched off.
01	Barrier cover warning light and barrier boom LED lighting strip* light up RED during barrier boom movement.
02	Barrier cover warning light and barrier boom LED lighting strip* light up as follows: a) RED - when the barrier boom is moving. b) GREEN - when the barrier boom is in the OPEN end-of-travel position.

7.6.2 Signalling in CLOSE end-of-travel position

Menu	P8
Function	F5
Function setting for visual signalling of the barrier when the barrier boom is closed. **NOTE** P8-F6 must be set to the value 01 or 02.	
Value	Signalling
no	Barrier cover warning light and barrier boom LED lighting strip* switched off.
on	Barrier cover warning light and barrier boom LED lighting strip* light up RED.

* Accessory, not included as standard equipment.

Barrier boom LED lighting strip*



A	LED lighting strips*	4	Red LED
2	Connection 2	5	Transformer for LED lighting strip*
3	Green LED	9	Connection 9

7.6.3 Pre-warning time

Menu	P8
Function	F2
If a travel command is given, the signalling unit lights up during the pre-warning phase before the barrier boom begins to move. Signalling units: • Barrier cover warning light lights up RED • Barrier boom LED lighting strip* lights up RED • Pre-warning light* is switched on **NOTE** • The pre-warning phase function issues a warning when the barrier opens and closes. • P8-F6 must be set to the value 01 or 02.	

Value	Pre-warning time
no	Deactivated
01 – 10	1 second – 10 seconds

7.6.4 Illumination period for parking area lighting*

Menu	P8
Function	F3
Function setting for the illumination period for the parking area lighting. When a travel command is given, the switching output switches the lighting on for the set illumination period. ▶ Switching output, see *Section 7.9.2*, relay function 02	

Value	Illumination period
00 – 99	0 seconds – 990 seconds
03	30 seconds

7.7 Protective device

Each BS 50 barrier with a minimum protection level of C and D in accordance with DIN EN 12453 must, in addition to force cut-out, be equipped with a protective device (compliant, approved add-on device, e.g. photocell*). This reduces the risk of contact with the barrier boom.

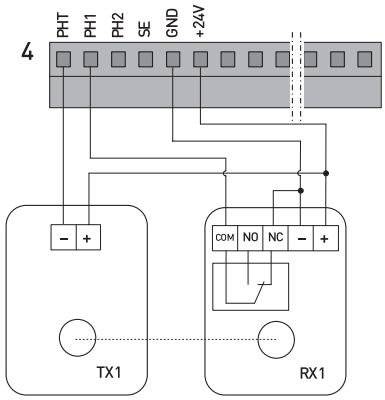
7.7.1 Self-testing of the protective device

Menu	P7
Function	F3
Function test of the photocell(s) before every dangerous run. The photocell transmitter is temporarily switched on / off by switching output PHT before the barrier boom begins to move. Outputs PH1 and / or PH2 monitor this test. **NOTE** If an automatic closing phase (*Section 7.4.1*) is set, self-testing of the protective device must be switched on.	

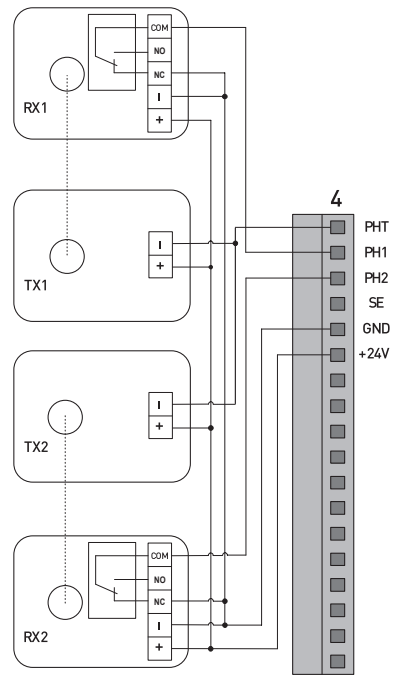
Photocell* without self-testing	
Value	Function
no	Self-testing deactivated

* Accessory, not included as standard equipment.

Photocell* with self-testing	
Value	Function
01	Self-testing connection 4 / PHT / PH1

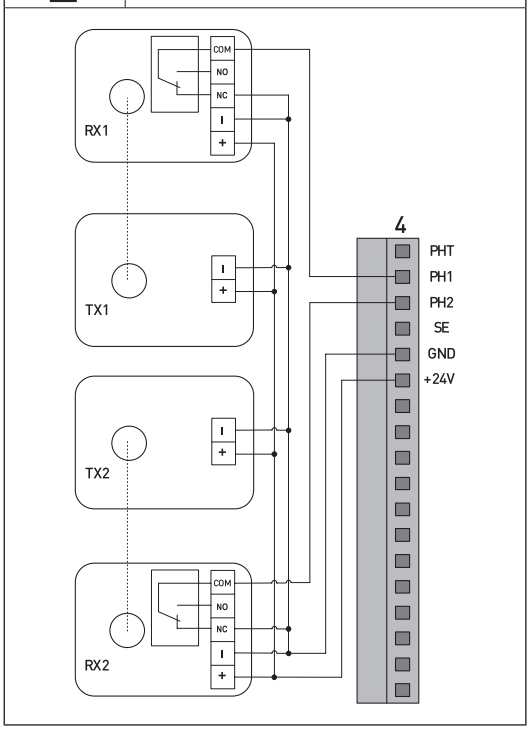


2 photocells* with self-testing	
Value	Function
02	Self-testing connection 4 / PHT / PH1 and PH2



* Accessory, not included as standard equipment.

2 photocells* without self-testing	
Value	Function
no	Self-testing deactivated



7.8 Barrier synchronous operation

Menu	P9
Function	F1
▶ See *Section 15.2* Function setting for barrier synchronous operation. Defines whether the barrier is operated as the main barrier or the synchronised barrier.	
Value	Operating mode
no	Deactivated
01	Main barrier
02	Synchronised barrier

7.9 Switching outputs

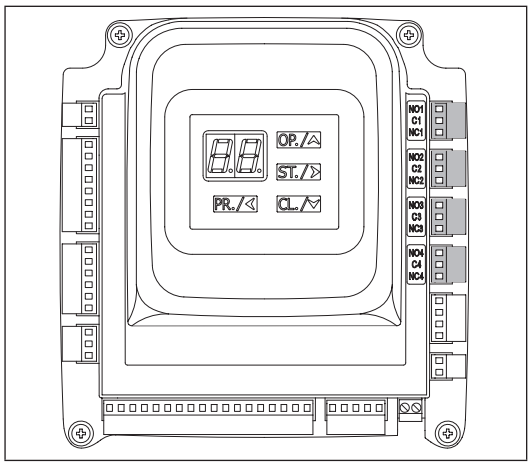
7.9.1 Adjustable switching outputs 5 – 8

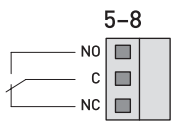
Menu	P3
Function	F4 / F5 / F6 / F7
Connections 5 – 8 of the barrier control are volt-free switching outputs. They can each be assigned to one relay function. There are 16 relay functions available.	
Switching output 5	
Menu	P3 - F4
no	Deactivated
Relay function 1 – 16	Description of relay functions ▶ See *Section 7.9.2*
Switching output 6	
Menu	P3 - F5
no	Deactivated
Relay function 1 – 16	Description of relay functions ▶ See *Section 7.9.2*
Switching output 7	
Menu	P3 - F6
no	Deactivated
Relay function 1 – 16	Description of relay functions ▶ See *Section 7.9.2*
Switching output 8	
Menu	P3 - F7
no	Deactivated
Relay function 1 – 16	Description of relay functions ▶ See *Section 7.9.2*

* Accessory, not included as standard equipment.

7.9.2 Relay functions for configurable switching outputs 5 – 8

Connections 5 – 8 of the barrier control are volt-free switching outputs. They can each be assigned to one relay function (01 – 16).



Switching output, volt-free, in the normal state	
	NO – normally open
	NC – normally closed

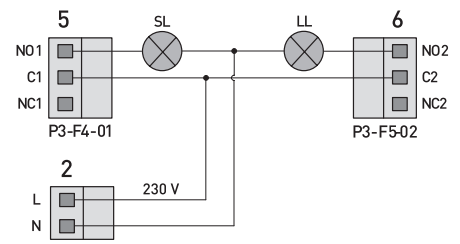
NOTE
The switching output / relay function are assigned in menu P3–F4 – F7.

Relay function 01	Warning light*

Function for switching outputs 5 – 8. The selected switching output switches the warning light* on. The switching output is activated during:

- The pre-warning time.
- The barrier boom's run to the end-of-travel position.

▶ Set the pre-warning phase, see *Section 7.6.3*, P8-F2.



SL	Warning light*
LL	Parking area lighting*

Relay function 02	Parking area lighting*

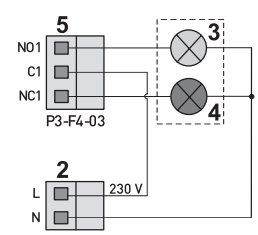
Function for switching outputs 5 – 8. The selected switching output switches the parking area lighting* on for the set illumination period. The switching output is activated with every travel command.

▶ Set the value for the illumination period.

▶ See *Section 7.6.4*, P8–F3

Relay function 03	Signalling with traffic light*

Function for switching outputs 5 – 8. The switching output is activated when the barrier boom reaches the OPEN end-of-travel position. The traffic light signal transmitters switch.

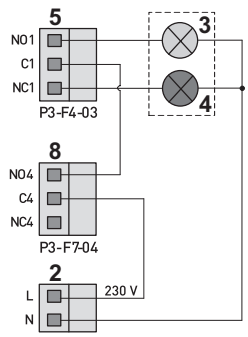


3	RED signal transmitter
4	GREEN signal transmitter

* Accessory, not included as standard equipment.

Relay function 04	Switch traffic light* off when the barrier boom is closed

Function for switching outputs 5 – 8. The switching output is deactivated when the barrier boom reaches the CLOSE end-of-travel position. The traffic light signal transmitters switch off.



3	RED signal transmitter
4	GREEN signal transmitter

Relay function 05	Changing lane operation - exit

Function for switching outputs 5 – 8.
Control of red / green traffic light in the exit direction of travel. The selected switching output switches under the following conditions:

- Travel command at signal input OP.
- The barrier boom has reached the OPEN end-of-travel position.

▶ See *Section 7.3.1*
▶ See *Section 15.3*, barriers - changing lane operation

Relay function 06	Changing lane operation - entrance

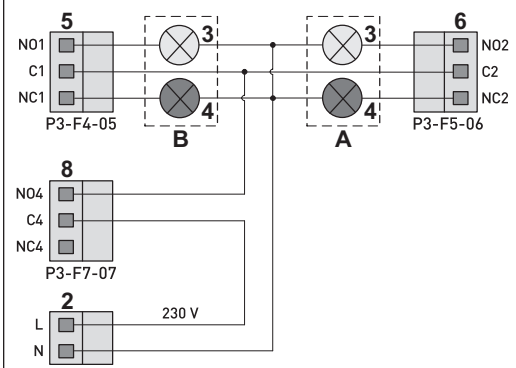
Function for switching outputs 5 – 8.
Control of red / green traffic light in the entrance direction of travel. The selected switching output switches under the following conditions:

- Travel command at signal input SBS.
- The barrier boom has reached the OPEN end-of-travel position.

▶ See *Section 7.3.1*
▶ See *Section 15.3*, barriers - changing lane operation

Relay function 07	Switch traffic light(s)* off when the barrier boom is closed

Function for switching outputs 5 – 8. The switching outputs are deactivated when the barrier boom reaches the CLOSE end-of-travel position. The traffic light signal transmitters switch off.



2	Connection 2	6	Connection 6
3	Green traffic light*	8	Connection 8
4	Red traffic light*	A	Entrance traffic light*
5	Connection 5	B	Exit traffic light*

Relay function 08	OPEN end-of-travel position

Function for switching outputs 5 – 8. The switching output is activated when the barrier boom reaches the OPEN end-of-travel position.

Relay function 09	CLOSE end-of-travel position

Function for switching outputs 5 – 8. The switching output is activated when the barrier boom reaches the CLOSE end-of-travel position.

Relay function 10	Signal after travel command - open barrier

Function for switching outputs 5 – 8. If the Open barrier travel command is given, the switching output is activated for the duration of 1 second.

Relay function 11	Signal after travel command - close barrier

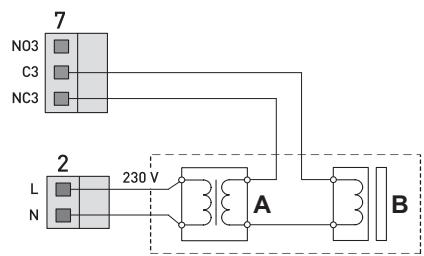
Function for switching outputs 5 – 8. If the Close barrier travel command is given, the switching output is activated for the duration of 1 second.

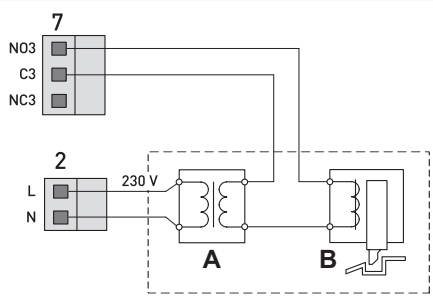
* Accessory, not included as standard equipment.

Relay function 12	Signal after travel command
Function for switching outputs 5 – 8. If the Open or Close barrier travel command is given, the switching output is activated for the duration of 1 second.	

Relay function 13	No function

Relay function 14	No function

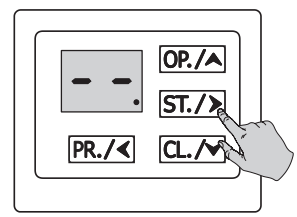
Relay function 15	**Magnet***
Function for switching outputs 5 – 8. Locking of the barrier boom in the CLOSE end-of-travel position, with the help of a magnet device.	
When the Open barrier travel command is given, the switching output is activated to switch the magnet off. The barrier boom begins to move after the set delay time is up. ▶ See *Section 7.4.3*, P7–F6	
	
A	Transformer*
B	Magnet*

Relay function 16	**Electromechanical locking***
Function for switching outputs 5 – 8. Locking of the barrier boom in the CLOSE end-of-travel position, with the help of an electromagnetic device.	
When the Open barrier travel command is given, the switching output is activated to switch the electromagnetic locking off. The barrier boom begins to move after the set delay time is up. ▶ See *Section 7.4.3*, P7–F6	
	
A	Transformer*
B	Electromechanical locking*

* Accessory, not included as standard equipment.

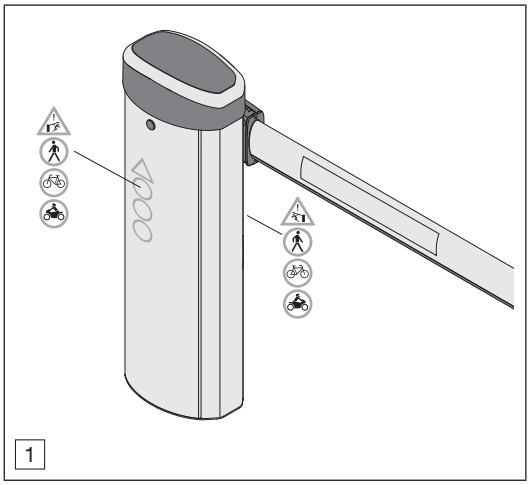
7.10 Factory setting

Resetting the barrier control to the factory setting. The factory reset deletes all customer-specific settings. The counter for barrier movement cycles is not deleted.

1	▶ To open the setting menu, press the PR./◀ button. ▶ Press and hold the button for ~5 s. The display shows: P1
2	▶ Press the CL./▼ button. The display shows: P0
3	▶ Press the ST./▶ button. The display shows: F0
4	▶ Press the ST./▶ button. The display shows: - -
5	▶ Press the ST./▶ button. ▶ Press and hold ST./▶ for ~5 s. The display shows a “dot”. The barrier control has been reset to the factory setting.
	
6	▶ If the display shows F0, press the PR./◀ button 2x to close the setting menu.

8 Final work

8.1 Applying the warning labels



8.2 Function check

When the barrier is fitted and all settings have been made, a function check has to be performed.

⚠ WARNING

Danger of injury due to faulty protective devices.
In case of an error, a non-functional protective device can result in injury.

- ▶ Make sure that the barrier boom is not loaded with add-on parts (e.g. signs, reflectors).
- ▶ Regularly check the function of the protective device.

The system is ready for operation only after this.

The following points must apply:

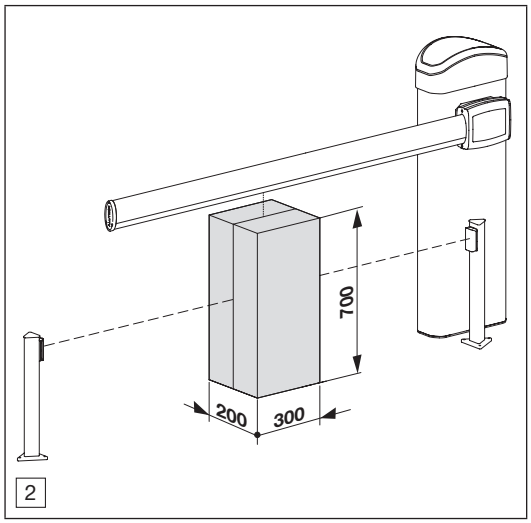
- Barrier is fixed correctly.
- Barrier boom is fixed correctly.
- Emergency release is easy to actuate when the barrier boom is closed (CLOSE end-of-travel position).
  - ▶ See *Section 9.1*
- Barrier boom is counterbalanced correctly.
  - ▶ See *Section 4.9*
- End-of-travel positions of the barrier boom are set.
  - ▶ See *Section 4.10*

▶ Close the barrier housing door.

- Following a travel command, the barrier boom moves to the OPEN and CLOSE end-of-travel positions at a steady speed. Stopping in the end-of-travel positions must be gentle.
  - ▶ Repeat this test several times.
- External travel commands and stop commands are executed correctly.
- Traffic light signal transmitters function according to the settings.

The settings for barrier boom sensitivity and closing force must meet safety standard EN 12453.	
▶ See	Menu
Section 7.5.1	P5
Section 7.5.2	P5
Section 7.5.3	P6

8.2.1 Function test with one photocell*

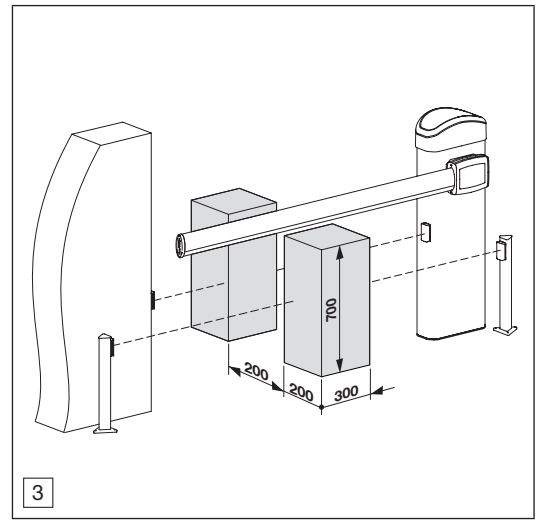


This test requires a specimen in accordance with EN 12453 with the dimensions
700 mm × 300 mm × 200 mm.

▶ Check the function of the photocell.

The barrier boom stops moving as soon as the specimen interrupts the beam of light. Test this behaviour along the entire length of the barrier boom.

8.2.2 Function test with two photocells**



This test requires two specimens in accordance with EN 12453 with the dimensions
700 mm × 300 mm × 200 mm.

▶ Test the function of the photocells.

– The barrier boom stops moving as soon as the specimen interrupts the beams of light. Test this behaviour along the entire length of the barrier boom. Check each photocell separately.
– Check the two photocells at the same time.

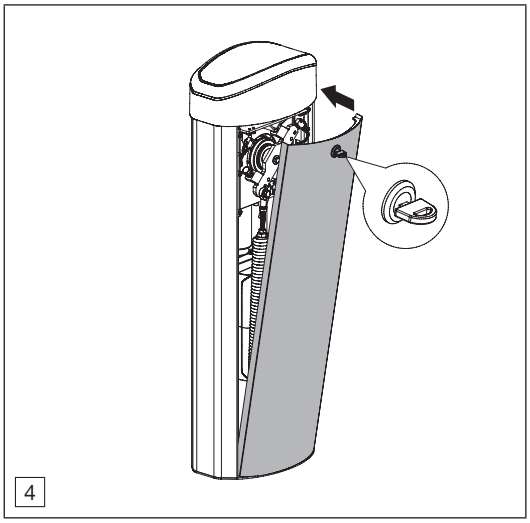
NOTE

If the result of one of the function tests is negative, immediately arrange for a specialist to carry out an inspection or repairs.

* Accessory, not included as standard equipment.

** Accessory, not included as standard equipment.

8.3 Closing the barrier housing

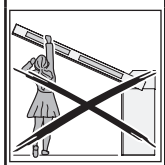


4

9 Operation

Operation by user.

▶ See *Section 2.4.3*



⚠ WARNING

Danger of injury during barrier travel.

The moving barrier boom can lead to injuries and damage in the area of the barrier.

- ▶ Children are not allowed to play near the barrier.
- ▶ Make sure that no persons or objects are in the barrier's area of travel.
- ▶ Monitor the barrier boom travel until the end-of-travel position is reached.
- ▶ Do not pass the barrier area until the barrier boom has opened completely.
- ▶ Never remain standing in the area of the open barrier boom.

⚠ CAUTION

Crushing hazard due to barrier travel.

During barrier travel, there can be areas with crushing hazard between the barrier housing and barrier boom.

- ▶ Do not reach in between the barrier housing and barrier boom during barrier travel.

ATTENTION

Danger of damage caused by wind load.

In case of excessive wind forces (> wind force 10 / storm), the barrier boom may be damaged.

- ▶ Check the barrier boom for possible damage and deformation after every storm.

9.1 Emergency release

If you want to move the barrier boom to the OPEN or CLOSE end-of-travel position by hand, without an electrical operator, you will have to actuate the emergency release.

⚠ CAUTION

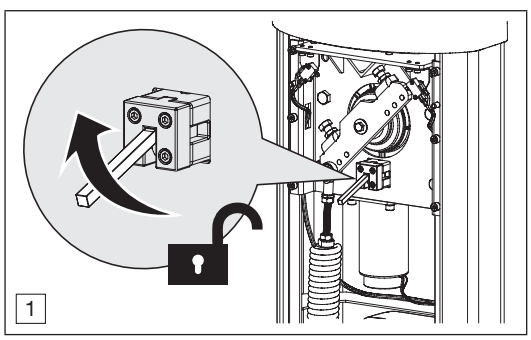
Danger of injury due to actuated emergency release.

When the emergency release is actuated, there is a risk of a fast barrier boom movement in the direction of the OPEN end-of-travel position.

- ▶ Make sure that no one is in the barrier boom's area of travel.
- ▶ Make sure that the barrier boom does not remain in the OPEN end-of-travel position with the emergency release actuated. This prevents uncontrolled downward movements of the barrier boom in the direction of the CLOSE end-of-travel position.

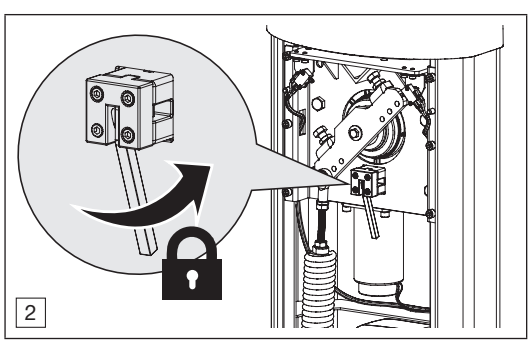
The emergency release must be actuated for the following activities:

- To open the barrier in case of power failure.
- To counterbalance the barrier boom.
- In case of other technical requirements.



Actuating the emergency release

- ▶ Pull the lever up.



Resetting the emergency release

- ▶ Push the lever down.

NOTE

The emergency release lever must always be easy to operate.

- ▶ If the emergency release can only be actuated with additional force, refer to *Section 14.6.*
- ▶ While the barrier boom is moving, the emergency release must not be actuated / reset.

9.2 Operating conditions

The following operating conditions can occur in addition to normal barrier operation.

Operating condition	Behaviour of the barrier
• The mains voltage for the barrier has been switched on. • Power restoration after power failure.	The barrier boom's first run to the CLOSE end-of-travel position is done at a reduced speed.
The barrier boom is in the CLOSE end-of-travel position and is lifted without a travel command.	Operating condition not permitted.
The barrier boom is blocked when travelling to the OPEN end-of-travel position.	1) Force cut-out with obstacle detection. 2) The barrier boom stops. 3) The barrier boom moves to the CLOSE end-of-travel position.
The barrier boom is in the OPEN end-of-travel position and is moved in the direction of the CLOSE end-of-travel position without a travel command.	Operating condition not permitted.
The barrier boom is blocked when travelling to the CLOSE end-of-travel position.	1) Force cut-out with obstacle detection. 2) The barrier boom stops. 3) The barrier boom moves to the OPEN end-of-travel position.

9.3 Behaviour during a power failure

In case of a power failure, the barrier boom remains in the position it was in at the time of the power failure. If you want to move the barrier boom to another position by hand, use the emergency release.

- ▶ See *Section 9.1*

9.4 Behaviour after the power returns

When the power returns, the barrier waits for travel commands.

10 Inspection and maintenance

Inspection and maintenance must be carried out by qualified specialised personnel.

▶ See *Section 2.4.2*

To ensure that the safety level remains constant, we recommend that the barrier is regularly inspected and maintained by a specialist according to the inspection plan:

- Barriers **without** self-testing protective device: **every six months**
- Barriers **with** self-testing protective device: **annually**

▶ See *Log book*

In general, independent of the log book inspection plan, it should always be made sure that the screw fittings to the roadway and the foundation are tight and durably resilient.

The operator can perform visual inspections.

▶ Check all safety and protective functions **monthly**.
▶ Check all protective devices without self-testing **every six months**.
▶ Check **every six months** whether the mains lead and the protection comply with the valid regulations.
▶ You must remedy any existing faults or defects **immediately**.

⚠ WARNING

Danger of injury by spring tension.

Serious injuries may occur while adjusting or loosening the spring.

▶ For your own safety, only have a specialist conduct work on the springs of the barrier and, if necessary, maintenance and repair work.
▶ Never try to replace, adjust, repair or reposition the spring for the counterbalance of the barrier or the spring mountings yourself.
▶ Check the entire barrier (joints, bearings, spring and fastenings) for wear and possible damage.
▶ Check for the presence of rust, corrosion, and cracks.

Defects on the barrier can lead to severe injuries.

▶ Do not use the barrier if repair or adjustment work must be conducted.

⚠ WARNING

Danger of injury due to unexpected barrier boom travel.

Unexpected movement of the barrier boom may occur if the door assembly is inadvertently actuated by third persons during inspection and maintenance work.

▶ Before all electrical work on the barrier, switch off the all-pole mains isolator switch.
▶ Safeguard the barrier system against being switched on again without authorisation.

An inspection or required repair may only be executed by a specialist. If necessary, contact your specialist dealer.

10.1 Checking the opening / closing force

For safe operation of the barrier, the setting for the barrier boom closing force must meet safety standard EN 12453.

▶ Check the closing force of the barrier boom when moving to the CLOSE end-of-travel position.
  ▶ See *Section 7.5.1*

10.2 Checking the obstacle detection

For safe operation of the barrier, the setting for the barrier boom obstacle detection must meet safety standard EN 12453.

▶ Check the sensitivity of obstacle detection when the barrier boom is moving to the CLOSE end-of-travel position.
  ▶ See *Section 7.5.2*

10.3 Checking the opening / closing speed

For safe operation of the barrier, the setting for the barrier boom speed must meet safety standard EN 12453.

▶ Check the closing speed of the barrier boom.
  ▶ See *Section 7.5.3*

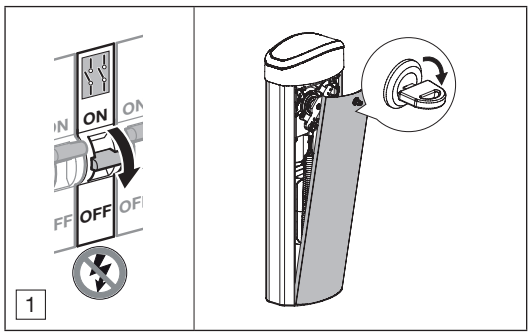
10.4 Checking the balance of the barrier boom

For safe operation of the barrier boom, the barrier boom must be counterbalanced correctly.

▶ Check the balance of the barrier boom.
  ▶ See *Section 4.9*

10.5 Dismantling the barrier boom

The barrier boom must be dismantled in case of barrier boom damage, other technical requirements or before disposal of the barrier.



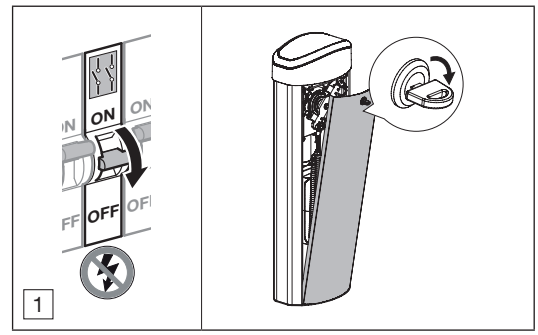
Prerequisites

- The barrier boom is in the OPEN end-of-travel position.

1. Loosen the bottom fixing point of the spring. The spring must be fully relaxed. If the spring is not fully relaxed, see *Section 4.9.3*.
2. Actuate the emergency release.
   ▶ See *Section 9.1*
3. Move the barrier boom to the CLOSE end-of-travel position by hand.
4. Reset the emergency release.
   ▶ See *Section 9.1*
5. Remove the covers from the barrier boom holder.
6. Loosen the screws on the barrier boom holder.
7. Pull the barrier boom out of the barrier boom holder.

10.6 Spring replacement

In case of a spring rupture or other technical requirements, the spring must be replaced.



Prerequisites

- The barrier boom is in the OPEN end-of-travel position. The spring is relaxed.

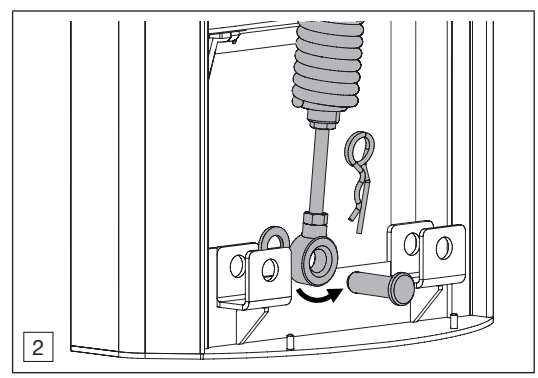
Spring replacement

⚠ CAUTION

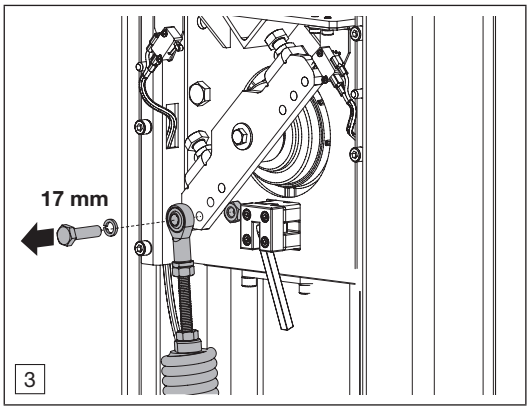
Hazard of trapping and crushing by the spring tension.

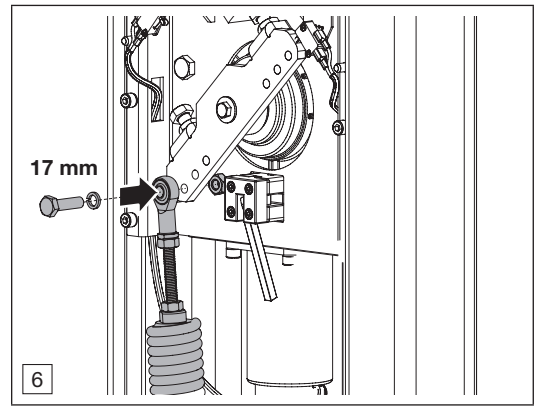
When replacing the spring, there is a hazard of trapping and crushing on the spring and inside the barrier housing.

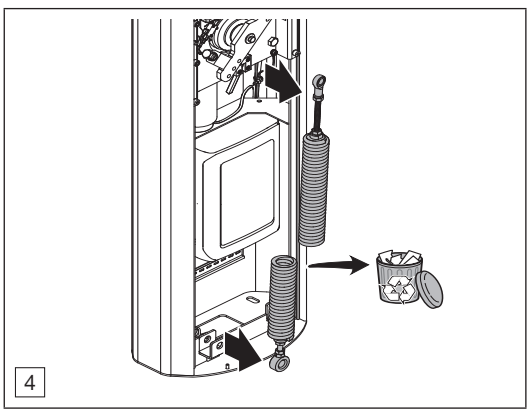
▶ Wear protective gloves when replacing the spring.

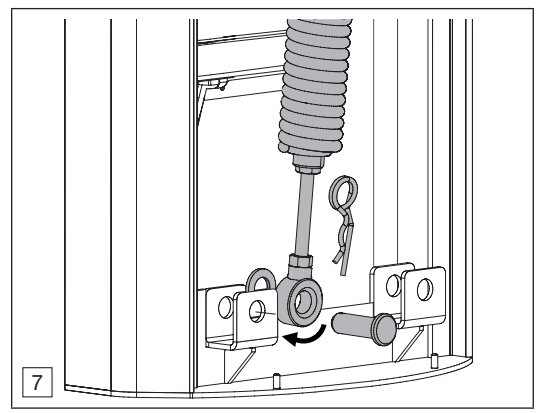


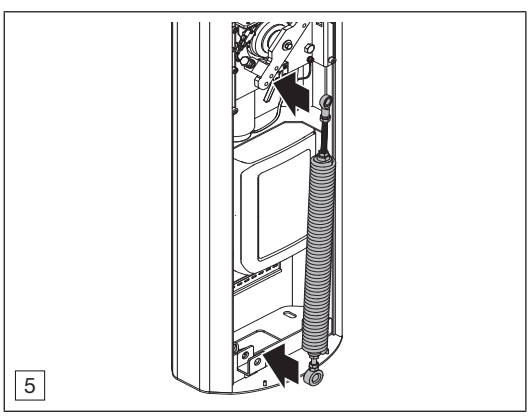
▶ Loosen the bottom fixing point of the spring. The spring must be fully relaxed. If the spring is not fully relaxed, see *Section 4.9.3*.







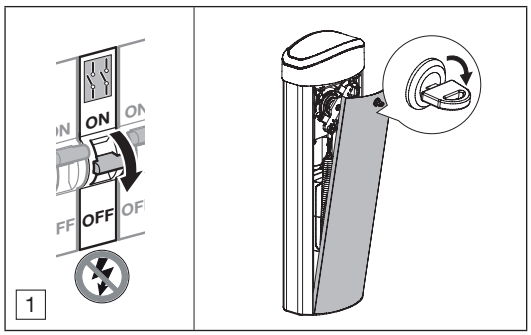




- The barrier boom must be counterbalanced after the spring is replaced.
  - See *Section 4.9*
- Switch the mains voltage of the barrier on.
- Perform a function check.
  - See *Section 8.2*
- Start up the barrier.

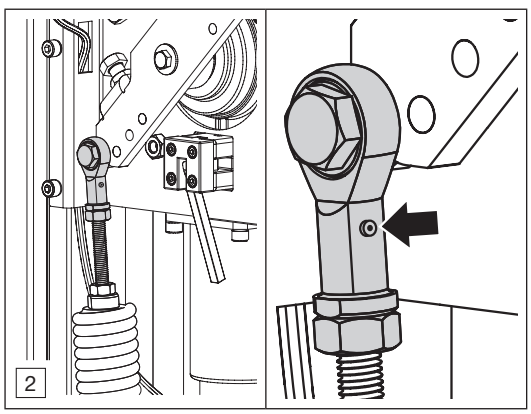
10.7 Lubricating the fixing of the spring

The upper fixing point of the spring must be lubricated following all maintenance by specialised personnel.



Prerequisites

- The barrier boom is in the OPEN end-of-travel position. The spring is relaxed.



- ▶ Press suitable lubricant into the intended opening.
- ▶ Switch the mains voltage of the barrier on.
- ▶ Perform a function check.
  - ▶ See *Section 8.2*
- ▶ Start up the barrier.

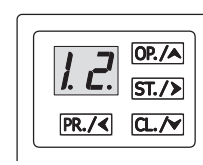
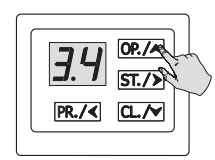
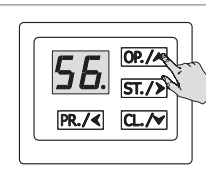
10.8 Movement cycles

The barrier's movement cycles can be read off a counter.

Movement cycle / working cycle	Definition: Barrier moves to OPEN and CLOSE end-of-travel position 1 ×.

- The counter value is displayed in six digits.
- The maximum display value is 999999.
- The counter digits are shown one after another.

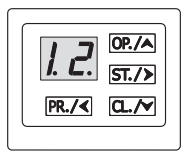
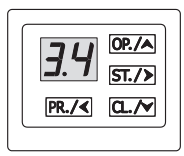
Example: Counter value 123456	

1	▶ To open the setting menu, press the PR./◀ button. ▶ Press and hold the button for ~5 s. The display shows: P1	
2	▶ Press the CL./▼ button. The display shows: P0	
3	▶ Press the ST./▶ button. The display shows: F0	
4	▶ Press the OP./▲ button. The display shows: F1	
5	▶ Press the ST./▶ button	
6	The display shows two digits with dots, e.g 1.2. These are the first two digits of the counter.	
7	▶ Press the OP./▲ button to see digits 3 and 4 of the counter.	
8	▶ Press the OP./▲ button to see digits 5 and 6 of the counter.	
9	▶ To close the setting menu, press the PR./◀ button 3x.	

10.9 Barrier control software version

- The value is displayed in four digits.
- The digits are shown one after another.

Example: Software version 1.2.34 

1	▶ Switch the mains voltage of the barrier on.	
2	The barrier control display shows the value: 8.8.	
3	▶ Wait 1 second.	
4	The display shows two digits with dots, e.g 1.2. These are the first two digits of the software version.	
5	▶ Wait 1 second.	
6	The display shows two digits with a dot, e.g. 3.4 These are the last two digits of the software version.	

11 Dismantling and disposal

Dismantling work must only be performed by qualified specialised personnel.

▶ See *Section 2.4.2*

⚠ DANGER

Deadly electric shock from mains voltage.

Contact with the mains voltage presents the danger of a deadly electric shock.

- ▶ Before all electrical work on the barrier, switch off the all-pole mains isolator switch.
- ▶ Safeguard the barrier system against being switched on again without authorisation.

NOTE

When dismantling the system, observe the applicable regulations governing workplace safety.

- ▶ Have a specialist dismantle the barrier in the reverse order of these instructions and dispose of it properly.

12 Technical data

Max. torque	230 Nm*
Barrier boom Standard length Barrier width	 3 - 5 m 2.71 - 4.71 m
Mains voltage	230 V (±10%) / 50 Hz
Power input Operation Standby	 100 W* <3 W
Intensity of use	Up to 500 cycles / day
Opening / closing phase	3 – 6 s*
Motor	24 V DC
Protection category	IP54
Permissible ambient temperature	–25…+50°C
Sound pressure level	≤70 dB(A)
Weight Barrier housing Barrier boom	 50 kg 1.32 kg/m
Dimensions Barrier housing (W× H × D) Barrier boom (W × H)	 220 mm × 1170 mm × 360 mm 50 mm × 120 mm (including impact protection)

Variables that can have a negative effect on and reduce the verified service life of the barrier system.	a) Unfavourable operating conditions and menu settings, e.g. – frequent interruptions to barrier boom movements, – increased power limit, – higher ON-time. b) External environmental effects, such as very sandy or salty environments. c) Overdue service and maintenance intervals

* Depending on the length of the barrier boom

13 Malfunctions and troubleshooting

Inspection and repair must be carried out by qualified specialised personnel.

▶ See *Section 2.4.2*

When troubleshooting faults and malfunctions, note the following:

- Barrier control display.
  ▶ See *Section 6.3*
- Barrier control diagnostic LED.
  ▶ See *Section 5.2.3*

13.1 Barrier without function

Nothing is shown on the barrier control display.

Possible cause	Possible remedy
The 230 V mains lead is interrupted.	▶ Check the 230 V AC voltage.
The barrier control is defective.	▶ Check the barrier control.

13.2 Barrier does not open

The barrier control display indicates it is ready for operation. Following a travel command (external), the barrier boom does not move to the OPEN barrier end-of-travel position.

Possible cause	Possible remedy
The barrier door is open.	▶ Close the barrier door.
The barrier door switch is defective.	▶ Check the barrier door switch.

13.3 Barrier does not close

The barrier control display indicates it is ready for operation. Following a travel command, the barrier boom does not move to the CLOSE barrier end-of-travel position.

Possible cause	Possible remedy
The barrier door is open.	▶ Close the barrier door.
The closing loop reports a detected vehicle.	▶ Check the status of the induction loop detector.
The protective device (e.g. photocell) blocks the barrier from closing.	▶ Check the status of the protective device (e.g. photocell).
The barrier boom is maintained in the OPEN end-of-travel position by a static external signal (e.g. control panel).	▶ Deactivate external static travel commands.

13.4 Barrier boom does not fully open or close

Following a travel command, the barrier boom does not move to the OPEN or CLOSE end-of-travel position completely.

Possible cause	Possible remedy
The length of the barrier boom is not set correctly.	▶ Check the value set for the barrier boom length. ▶ See menu P1 / F1.
The fixing position of the spring on the operator lever is not correct.	▶ Check the fixing of the spring. ▶ See *Section 4.7*
The barrier boom is not counterbalanced correctly.	▶ Counterbalance the barrier boom. ▶ See *Section 4.9*

13.5 Barrier boom jerks

The barrier boom jerks when travelling to the OPEN or CLOSE end-of-travel position.

Possible cause	Possible remedy
The opening force is set too low.	▶ Check the value set for the opening force. ▶ See *menu P5 / F1*
The closing force is set too low.	Check the value set for the closing force. ▶ See *menu P5 / F2*

13.6 Barrier too slow to open / close

The opening / closing speed is much slower than set in *Section 7.5.3*.

Possible cause	Possible remedy
The barrier housing door is open. The travel command was generated using the control buttons OP. / CL. on the barrier control.	Protective function. If a travel command is given via the control buttons OP. / CL., the barrier boom moves at a reduced speed. ▶ Close the barrier housing door. ▶ Use connections OP / CL. ▶ See *Section 7*
Return of the supply voltage after power failure or after switching on.	The barrier boom's first run to the CLOSE end-of-travel position is done at a reduced speed. ▶ Give another travel command.
Control type press-and-hold operation is set.	With control type press-and-hold operation, the barrier boom travels at a reduced speed. ▶ Select a different control type if necessary.

13.7 Barrier boom end-of-travel position error

- The barrier boom is not perfectly vertical when the barrier is open.
- The barrier boom is not perfectly horizontal when the barrier is closed.

Possible cause	Possible remedy
The barrier boom is not counterbalanced correctly.	▶ Counterbalance the barrier boom. ▶ See *Section 4.9*
The end-of-travel position settings of the barrier boom have been changed.	▶ Set the end-of-travel positions. ▶ See *Section 4.10*

13.8 Emergency release sluggish

The emergency release can only be actuated with additional force.

Possible cause	Possible remedy
The fixing position of the spring on the operator lever is not correct.	▶ Check the fixing of the spring. ▶ See *Section 4.7*
The barrier boom is not counterbalanced correctly.	▶ Counterbalance the barrier boom. ▶ See *Section 4.9*
The operator is defective.	▶ Have specialised personnel check the barrier.

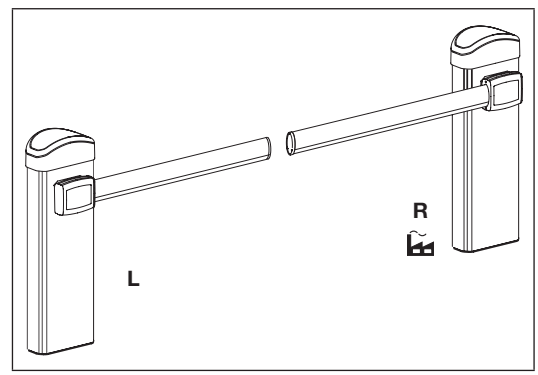
14 Additional information for initial start-up and operation

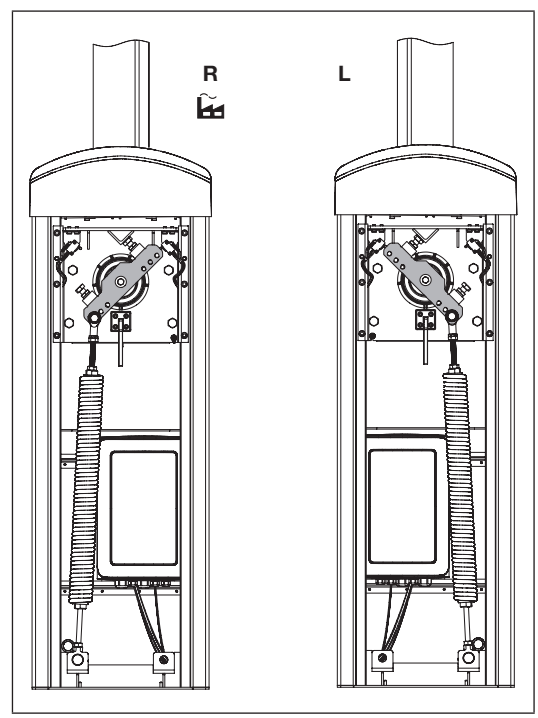
14.1 Converting the barrier to left-hand operation

The barrier has to be converted to left-hand operation for the following applications:

- Barrier synchronous operation.
  ▶ See *Section 15.2*
- In case of structural requirements.

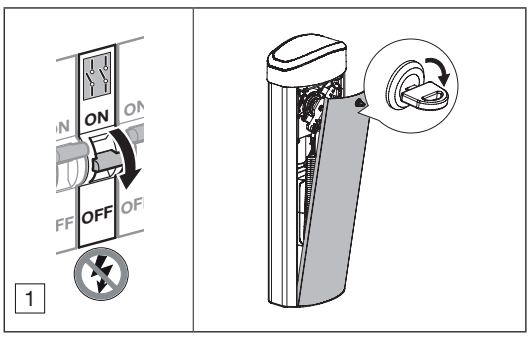
R	Barrier for right-hand operation	
L	Barrier for left-hand operation	Conversion required





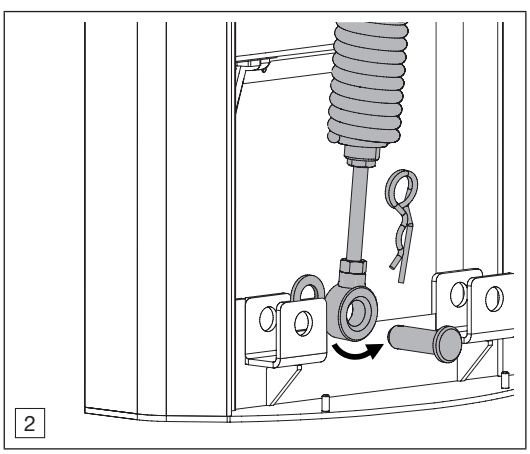
⚠ CAUTION
Hazard of trapping and crushing by the spring tension.
When working on the spring, there is a hazard of trapping and crushing on the spring and inside the barrier housing. ▶ Wear protective gloves.

14.1.1 Removing the spring

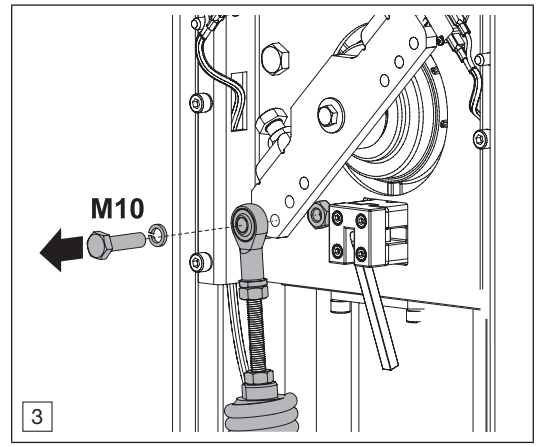


Prerequisites

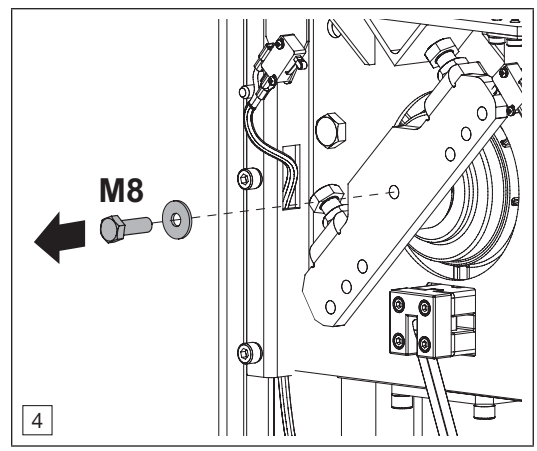
- The barrier boom is in the OPEN end-of-travel position.
- The spring must be fully relaxed.



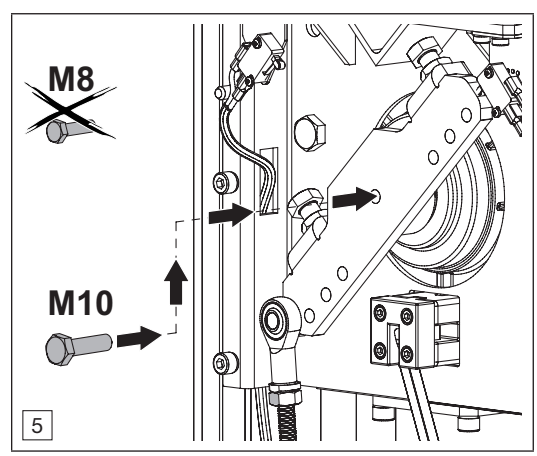
▶ Loosen the bottom fixing point of the spring. The spring must be fully relaxed. If the spring is not fully relaxed, see *Section 4.9.3*.

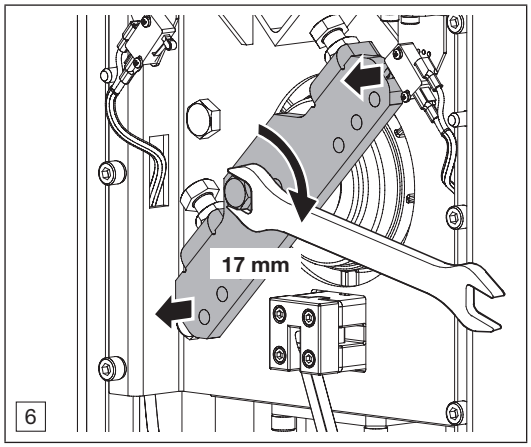


14.1.2 Remounting the operator lever

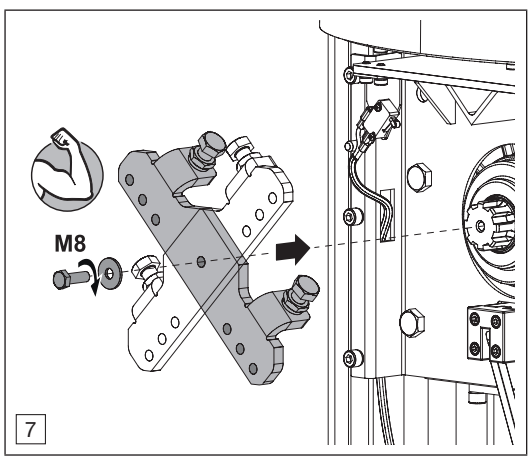


▶ Remove the screw connection on the operator lever. To do so, unscrew the M8 screw completely and remove it.





Turning the M10 screw in loosens the operator lever. This allows it to be removed easily.



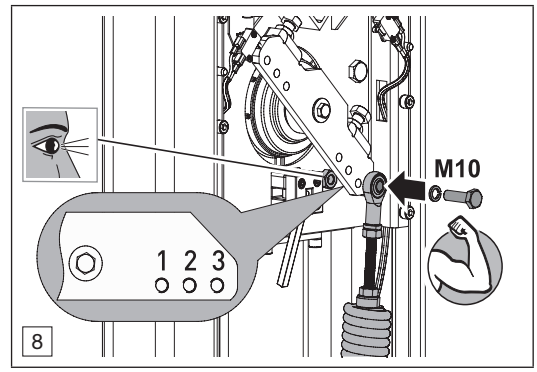
When you have removed the operator lever, you have to rotate it 90°.

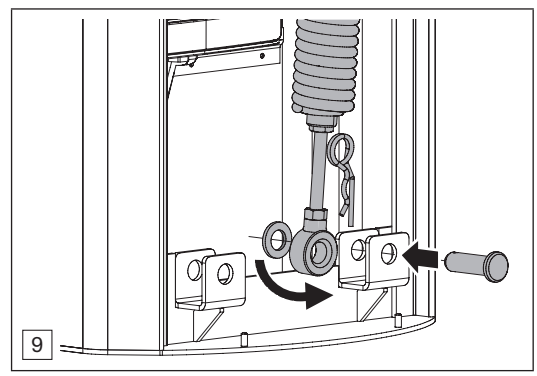
- ▶ Carefully slide the operator lever (rotated 90°) onto the operator axle.
- ▶ Screw the operator lever to the operator axle. Use the M8 screw.

14.1.3 Fitting the barrier boom

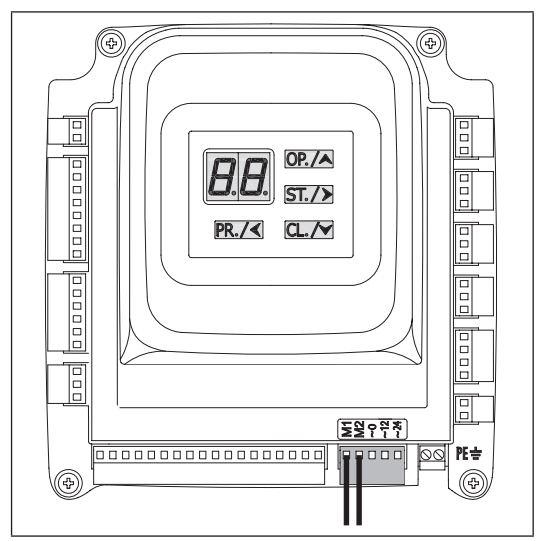
- ▶ Fit the barrier boom.
  - ▶ See *Section 4.6*

14.1.4 Installing the spring



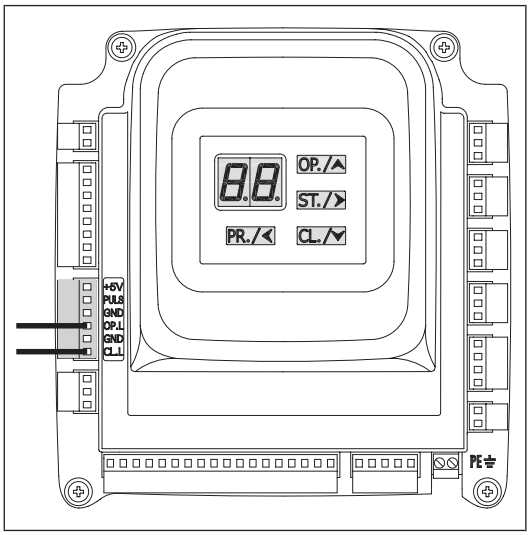


14.1.5 Reconnecting the operator supply voltage



- ▶ Reconnect the power supply for the operator on the barrier control. To do so, reverse the cables for contacts M1 and M2 at connection 13.

14.1.6 Reconnecting the limit switches



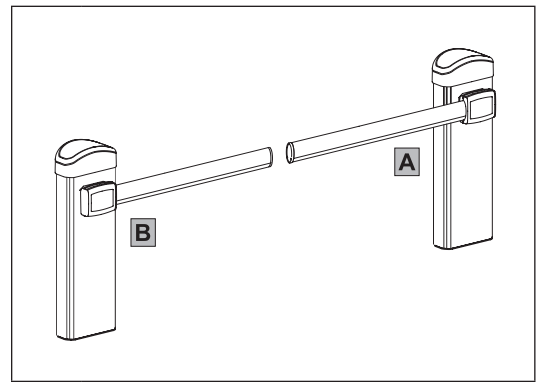
- ▶ Reconnect the limit switches on the barrier control. To do so, reverse the cables for contacts OP.L. and CL.L at connection 12.

14.1.7 Final work

- ▶ Switch the mains voltage on.
- ▶ Reset the emergency release.
  - ▶ See *Section 9.1*
- ▶ Return the barrier to factory settings.
  - ▶ See *Section 7.10*
- ▶ Set the length of the fitted barrier boom.
  - ▶ See *Section 7.1.1*
- ▶ Perform a function check.
  - ▶ See *Section 8.2*
- ▶ Close the barrier housing.
  - ▶ See *Section 8.3*

14.2 Barrier synchronous operation

To block off larger road widths, two barriers can be fitted opposite one another and run in synchronous operation. The barrier booms are opened and closed simultaneously, that is, in sync.



A	Main barrier
B	Synchronised barrier

The main barrier controls the synchronised barrier.

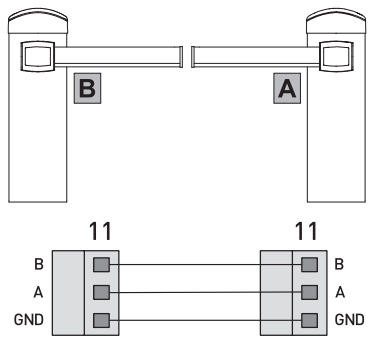
14.2.1 Prerequisites

The following prerequisites must be fulfilled for barrier synchronous operation.

The synchronised barrier B must be converted to left-hand operation.	▶ See *Section 15.1*
Fitting of barriers A and B must be completed. The barrier booms of barriers A and B must have the same length.	▶ See *Section 4*
Installation of barriers A and B must be completed.	▶ See *Section 5*
Initial start-up of barriers A and B must be completed.	▶ See *Section 6*

14.2.2 Connections

▶ For barrier synchronous operation, barrier A must be connected to barrier B. Use the built-in RS485 interfaces for this.



RS485 interfaces

Component	Connection
Barrier A and B: COM-RS485 interface CAT5 / 2 × 2 × 0.5. Maximum cable length 20 m.	Connection 11 COM1 / RS485. ▶ See *Section 5.2.2*
Barrier A: – Protective device* – Radio receiver* – Accessories*	Connections / contacts. ▶ See *Section 5.2.2*
Barrier B: – Protective device* **NOTE** Not all contacts / inputs are available for the synchronised barrier.	The following contacts / inputs are available: S / PH1 / PH2 / PHT / SE / CVR ▶ See *Section 5.2.2*

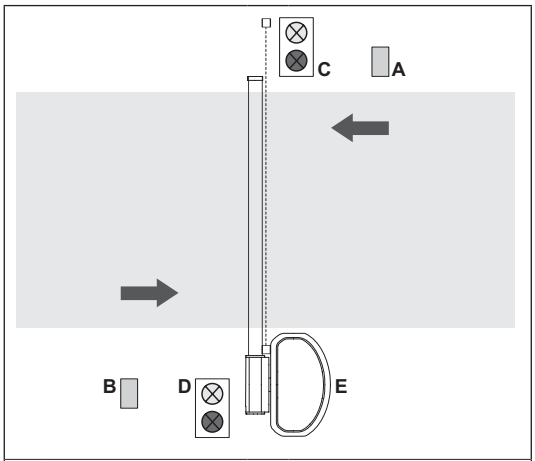
14.2.3 Settings

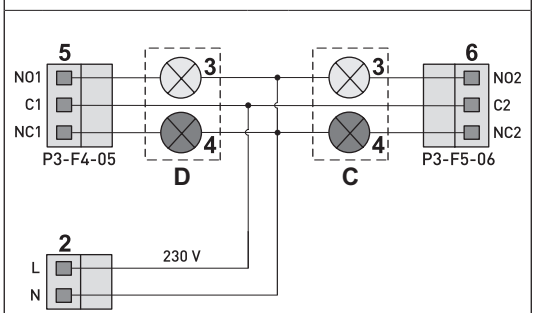
Function	Setting
Barrier A is the main barrier. Set the barrier control for this operating mode.	P9-F1-01 ▶ See *Section 7.8*
Barrier B is the synchronised barrier. Set the barrier control for this operating mode.	P9-F1-01 ▶ See *Section 7.8*

Settings		
▶ Check the settings from the sections listed below. ▶ Change the settings as required.		
Barrier A Main barrier ▶ See section		Barrier B Synchronised barrier ▶ See section
7.1.1 *7.2.1* *7.2.2* *7.3.1* *7.3.2* *7.3.3* *7.4.1* *7.4.2* *7.4.3* *7.5.1*	*7.5.2* *7.5.3* *7.6.1* *7.6.2* *7.6.3* *7.6.4* *7.7.1* *7.8* *7.9*	*7.1.1* *7.5.1* *7.5.2* *7.5.3* *7.6.1* *7.6.2* *7.6.3* *7.8*
▶ In the following sections, set **identical** values for barriers A and B.		*Section 7.5.1* *Section 7.5.2* *Section 7.5.3*

* Accessory, not included as standard equipment.

14.3 Barrier changing lane operation





A	Entry	2	Connection 2
B	Exit	3	Green signal transmitter*
C	Entrance traffic light*	4	Red signal transmitter*
D	Exit traffic light*	5	Connection 5
E	Barrier	6	Connection 6

14.3.1 Prerequisites

The following prerequisites must be fulfilled for barrier changing lane operation:

Barrier fitting is completed.	▶ See *Section 4*
Barrier installation is completed.	▶ See *Section 5*
Barrier initial start-up is completed.	▶ See *Section 6*
The protective device* (photocell) is connected.	▶ See *Section 7.7.1*

14.3.2 Connections

Component	Connection
OPEN contact of the access authorisation system* for the entrance	Barrier control Connection 4 / SBS. ▶ See *Section 5.2.2* ▶ See *Section 7.3.1*
OPEN contact of the access authorisation system* for the exit	Barrier control Connection 4 / OP. ▶ See *Section 5.2.2* ▶ See *Section 7.3.1*
Red / green traffic light* for entrance	Barrier control Switching output Connection 6. ▶ See *Section 5.2.2*
Red / green traffic light* for exit	Barrier control Switching output Connection 5. ▶ See *Section 5.2.2*
Protective device / photocell(s)*	▶ See *Section 5.2.2*

14.3.3 Settings

Function	Setting
Signal inputs SBS and OP.	▶ See *Section 7.3.1,* P3–F8–03
Red / green traffic light* for entrance	▶ See *Section 7.9,* P3–F5–06
Red / green traffic light* for exit	▶ See *Section 7.9,* P3–F4–05
Barrier cover warning light / LED lighting strips*	▶ See *Section 7.6.1,* P8–F6–01
Barrier boom automatic closing phase	▶ See *Section 7.4.1,* P4–F1–15
Barrier boom automatic closing phase after photocell*	▶ See *Section 7.4.2,* P4–F2–01
Protective device / photocell(s)	▶ See *Section 7.7.1,* P7–F3–01 or 02

* Accessory, not included as standard equipment.

BS 50

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