CAME

OPERATOR
FOR SLIDING GATES

FA00729-EN

INSTALLATION MANUAL

BY-3500T

EN English

WARNING!
important safety instructions for people:
READ CAREFULLY!

Premise

• This product should only be used for the purpose for which it was explicitly designed. Any other use is dangerous. CAME S.p.A. is not liable for any damage caused by improper, wrongful and unreasonable use • Keep these warnings together with the installation and operation manuals that come with the operator.

Before installing

(checking what's there: if something is missing, do not continue until you have complied with all safety provisions)

• Check that the automated parts are in proper mechanical order, that the operator is level and aligned, and that it opens and closes properly. Make sure you have suitable mechanical stops • If the operator is to be installed at a height of less than 2.5 m from the ground or other access level, make sure you have any necessary protections and/or warnings in place • If any pedestrian openings are fitted into the operator, there must also be a a system to block their opening while they are moving • Make sure that the opening automated door or gate cannot entrap people against the fixed parts of the operator • Do not fit upside down or onto elements that could bend. If necessary, add suitable reinforcements to the anchoring points • Do not install door or gate leaves on tilted surfaces • Make sure any sprinkler systems cannot wet the operator from the ground up • Make sure the temperature range shown on the product literature is suitable to the climate where it will be installed • Follow all instructions as improper installation may result in serious bodily injury • It is important to follow these instructions for the safety of people. Keep these instructions.

Installing

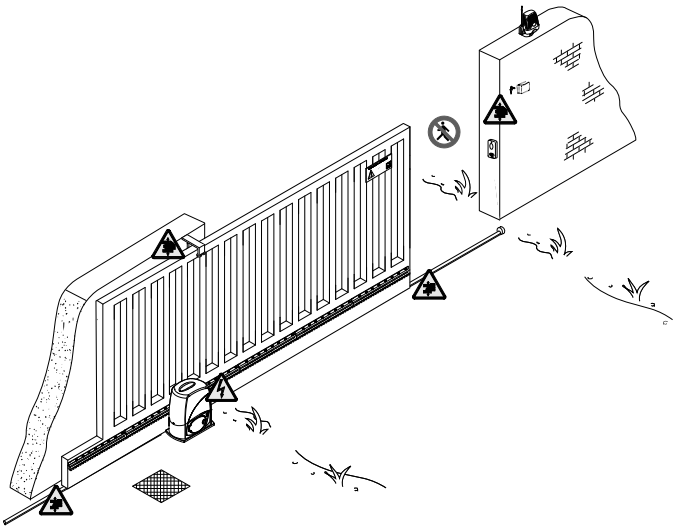
• Suitably section off and demarcate the entire installation site to prevent unauthorized persons from entering the area, especially minors and children • Be careful when handling operators that weigh over 20 kg. If need be, use proper safety hoisting equipment • All opening commands (that is, buttons, key switches, magnetic readers, and so on) must be installed at least 1.85 m from the perimeter of the gate's working area, or where they cannot be reached from outside the gate. Also, any direct commands (whether buttons, touch panels, and so on) must be installed at least 1.5 m from the ground and must not be reachable by unauthorized persons • All maintained action commands, must be fitted in places from which the moving gate leaves and transit and driving areas are visible • Apply, if missing, a permanent sign showing the position of the release device • Before delivering to the users, make sure the system is EN 12453 standard compliant (regarding impact forces), and also make sure the system has been properly adjusted and that any safety, protection and manual release devices are working properly • Apply Warning Signs where necessary and in a visible place, (such as, such as the gate's plate

Special user-instructions and recommendations

• Keep gate operation areas clean and free of any obstructions. Make sure that the photocells are free of any overgrown vegetation and that the operator's area of operation is free of any obstructions • Do not allow children to play with fixed commands, or to loiter in the gate's maneuvering area. Keep any remote control transmitters or any other command device away from children, to prevent the operator from being accidentally activated. • The apparatus may be used by children of eight years and above and by physically, mentally and sensory-challenged people, or even ones without any experience, provided this happens under close supervision or once they have been properly instructed to use the apparatus safely and to the potential hazards involved. Children must not play with the apparatus. Cleaning and maintenance by users must not be done by children, unless properly supervised • Frequently check the system for any malfunctions or signs of wear and tear or damage to the moving structures, to the component parts, all anchoring points, including cables and any accessible connections. Keep any hinges, moving joints and slide rails properly lubricated • Perform functional checks on the photocells and sensitive safety edges, every six months. To check whether the photocells are working, wave an object in front of them while the gate is closing; if the operator inverts its direction of travel or suddenly stops, the photocells are working properly. This is the only maintenance operation to do with the power on. Constantly clean the photocells' glass covers using a slightly water-moistened cloth; do not use solvents or other chemical products that may ruin the devices • If repairs or modifications are required to the system, release the operator and do not use it until safety conditions have been restored • Cut off the power supply before releasing the operator for manual openings and before any other operation, to prevent potentially hazardous situations. Read the instructions If the power supply cable is damaged, it must be replaced by the manufacturer or authorized technical assistance service, or in any case, by similarly qualified persons, to prevent any risk • It is FORBIDDEN for users to perform any OPERATIONS THAT ARE NOT EXPRESSLY REQUIRED OF THEM AND WHICH ARE NOT LISTED in the manuals. For any repairs, modifications / adjustments, and for extra-ordinary maintenance, CALL TECHNICAL ASSISTANCE • Log the job and checks into the periodic maintenance log.

Further recommendations for all

• Keep clear of hinges and mechanical moving parts • Do not enter the operator's area of operation when it is moving • Do not counter the operator's movement as this could result in dangerous situations • Always pay special attention to any dangerous points, which have to be labeled with specific pictograms and/or black and yellow stripes • While using a selector switch or a command in maintained actions, keep checking that there are no persons within the operating range of any moving parts, until the command is released • The gate may move at any time and without warning • Always cut off the mains power supply before performing any maintenance or cleaning.



Danger of foot crushing

Danger of hand crushing

Danger! High voltage.

No transiting while the barrier is moving

KEY

🕮 This symbol indicates parts to read carefully.
⚠ This symbol indicates parts about safety.
☞ This symbol tells you what to say to the end users.

DESCRIPTION

This product has been designed and built by CAME CANCELLI AUTOMATICI S.p.A. in compliance with applicable safety standards.
The operator consists of a cast aluminium part, with a non-reversible electromechanical gearmotor operating inside and an ABS container for the control board with the transformer.

Intended use

The BY-3500T operator has been designed to power sliding gates for industrial use.

🕮 Any installation and operation that differs from what is set out in this manual is prohibited.

Limits of use

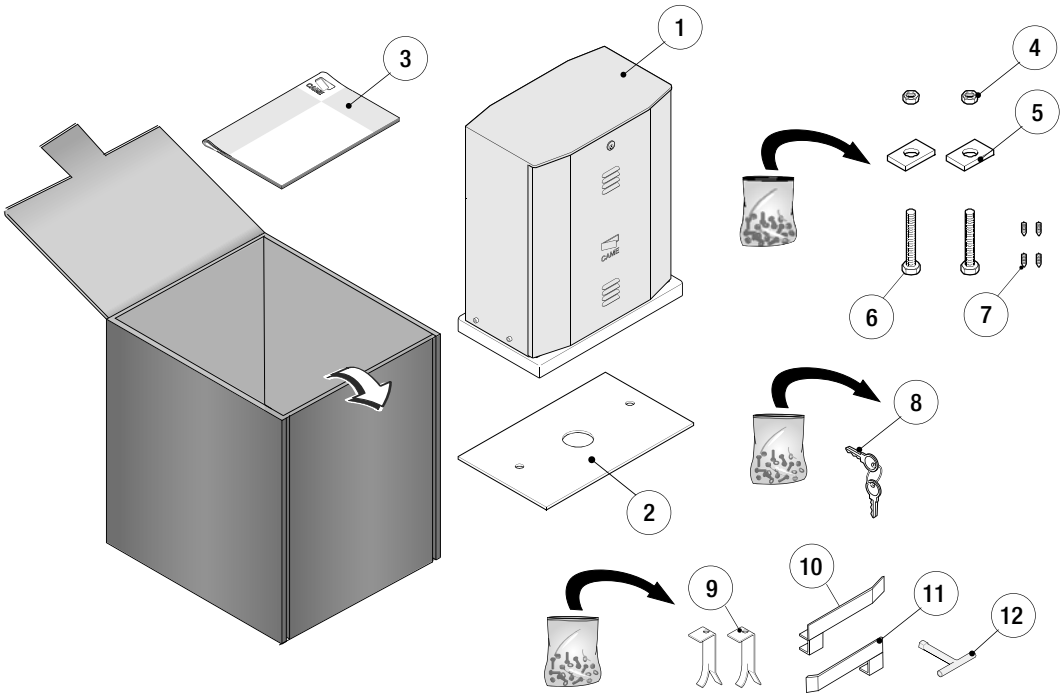
Type	BY-3500T
Max. leaf length (m)	17
Max. leaf weight (kg)	3.500

Technical data

Type	BY-3500T
Protection rating (IP)	54
Power supply (V - 50/60 Hz)	230/400 AC THREE-PHASE
Motor power supply (V - 50/60 Hz)	230/400 AC THREE-PHASE
Current draw (A)	2
Power (W)	750
Thrust (N)	3500
Opening speed (m/min)	10,5
Duty cycle (%)	50
Operating temperature (°C)	-20 - +55
Motor thermal protection (°C)	150
Gear ratio (i)	1/28
Insulation class	⧈
Weight (kg)	74

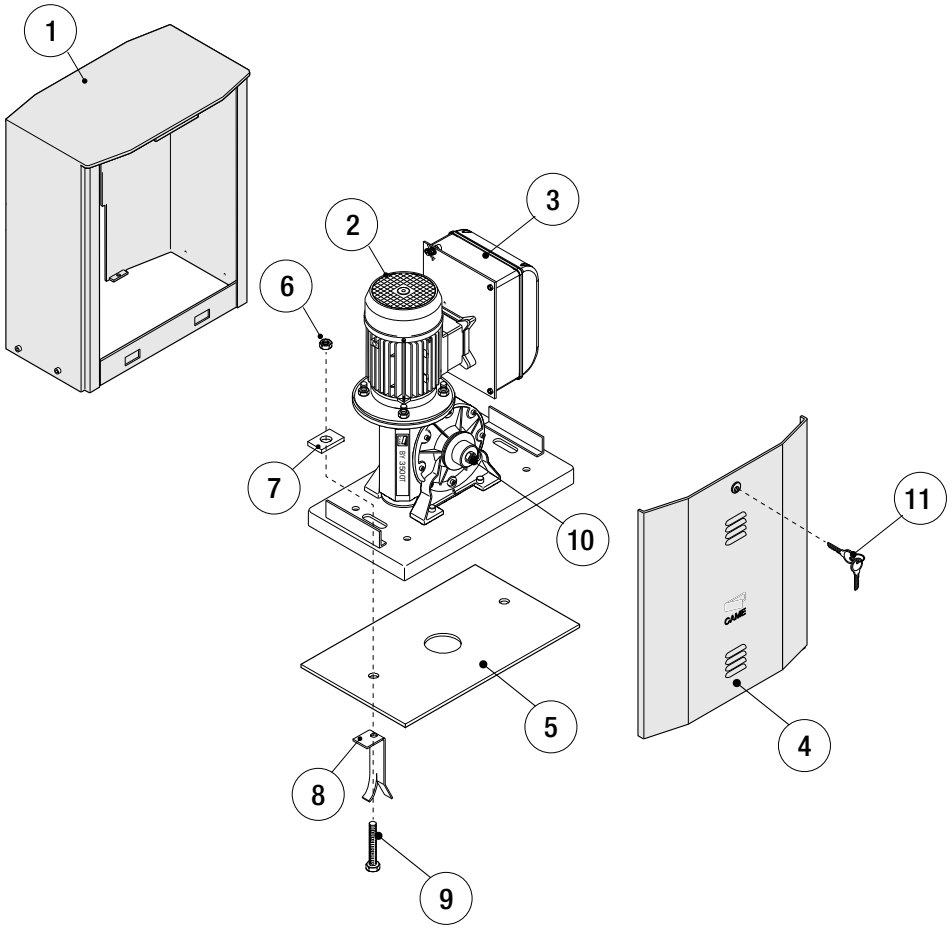
Packing list

1. 1 x operator
2. 1 x fixing plate
3. 1 x installation manual
4. 2 x UNI5588 M12 nuts
5. 2 x washers
6. 2 x UNI5739 M12x70 screws
7. 4 x UNI5927 M6x25 end run grub screws
8. 2 x keys for inspection hatch
9. 2 x anchor brackets
10. 1 x left-hand end run fin
11. 1 x right-hand end run fin
12. 1 x release key

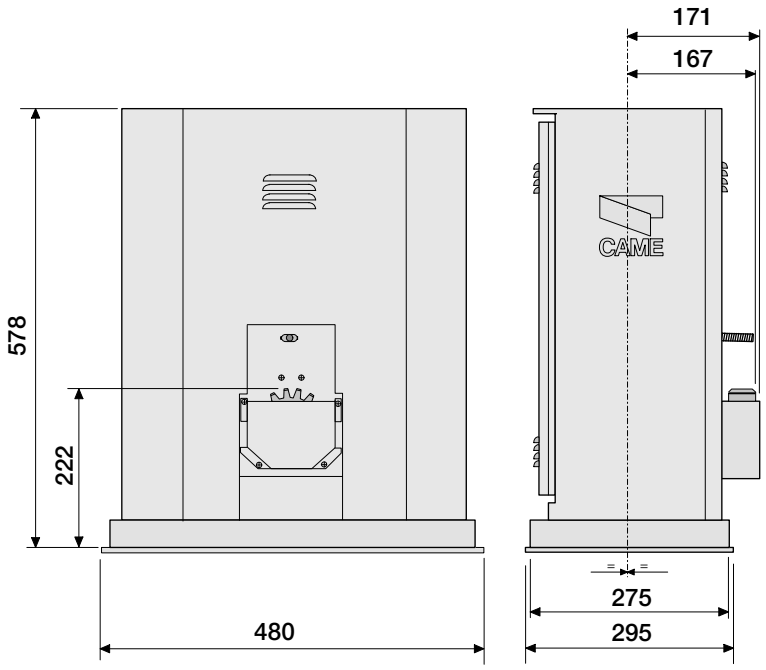


Description of the components

1. Cabinet
2. Gearmotor
3. Control panel
4. Inspection panel
5. Fixing plate
6. Nut
7. Washer
8. Anchor bracket
9. Screw
10. Release nut
11. Customised DIN keys



Dimensions (mm)



GENERAL INSTALLATION INSTRUCTIONS

⚠ Installation must be carried out by qualified and experienced personnel in compliance with applicable regulations.

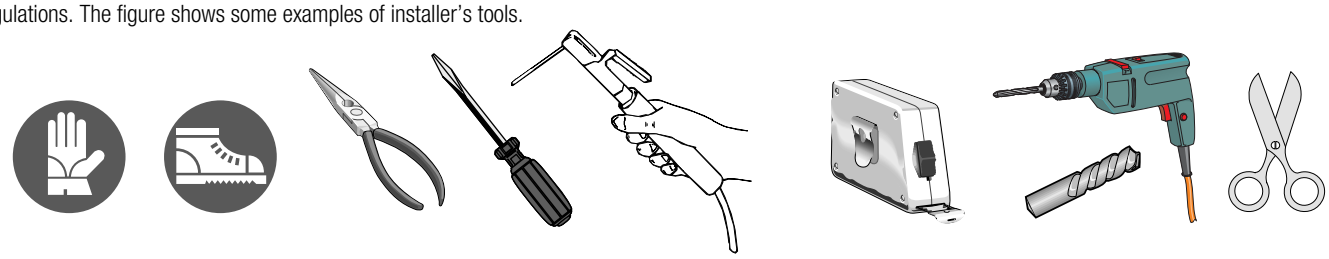
Preliminary checks

⚠ Before installing the operator:

- Check that the gate is stable, and that the sliding wheels are in good condition and greased.
- Check that the ground guide is securely fixed to the ground, completely on the surface and free from irregularities that may hinder gate movement.
- Check that the upper guide blocks do not create friction.
- Make sure there is one opening and one closing mechanical stop.
- Make sure that the mounting point for the gearmotor is in an area protected from impacts and that the anchoring surface is solid;
- Provide a suitable single-pole disconnection device, with a maximum of 3 mm between the contacts, to disconnect the power supply;
- ⏚ Make sure that any connections within the container (made to ensure the continuity of the protection circuit) are fitted with extra insulation compared to the other internal conductor parts;
- Prepare suitable piping and ducts for routing the electrical cables, ensuring protection against mechanical damage.

Tools and materials

Make sure you have all the tools and materials you will need for the installation at hand to work in total safety and compliance with current standards and regulations. The figure shows some examples of installer's tools.



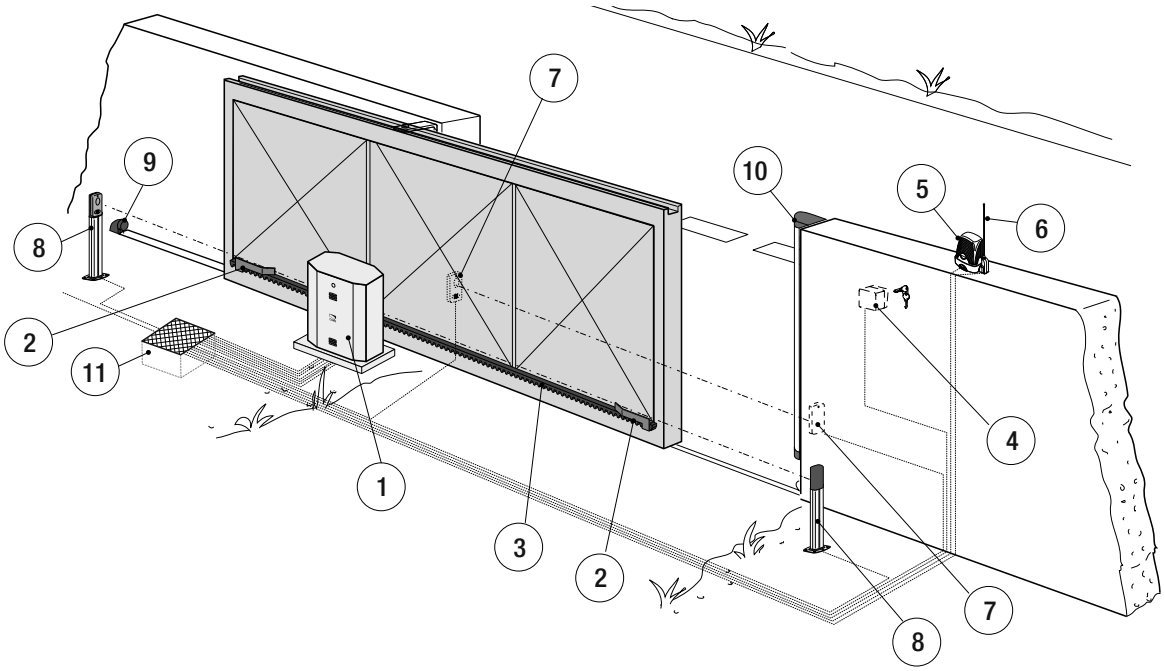
Types of cables and minimum thicknesses

Connection	Cable type	Cable length 1 < 10 m	Cable length 10 < 20 m	Cable length 20 < 30 m
Board power supply 230/400 V 3P	H05RN-F	4G x 1.5 mm^2	4G x 2.5 mm^2	4G x 4 mm^2
Flashing light	FROR CEI 20-22 IEC EN 50267-2-1	2 x 0.5 mm^2	2 x 1 mm^2	2 x 1.5 mm^2
Photocell transmitters		2 x 0.5 mm^2	2 x 0.5 mm^2	2 x 0.5 mm^2
Photocell receivers		4 x 0.5 mm^2	4 x 0.5 mm^2	4 x 0.5 mm^2
Control and safety devices		2 x 0.5 mm^2	2 x 0.5 mm^2	2 x 0.5 mm^2
Limit switch connection		4 x 0.5 mm^2	4 x 0.5 mm^2	4 x 0.5 mm^2
Antenna connection	RG58	max. 10 m		

N.B.: If the cables differ in length compared to what is shown in the table, the cable cross-section is determined according to the actual current draw of the devices connected and according to the provisions of the IEC EN 60204-1 standard.
For connections that require several, sequential loads, the sizes given on the table must be re-evaluated based on actual power draw and distances. When connecting products that are not specified in this manual, please refer to the documentation provided with said products.

Example of a system

1. Operator
2. End run fin
3. Rack
4. Key selector
5. Flashing light
6. Antenna
7. Photocells
8. Photocell column
9. End run
10. Safety edge
11. Inspection chamber

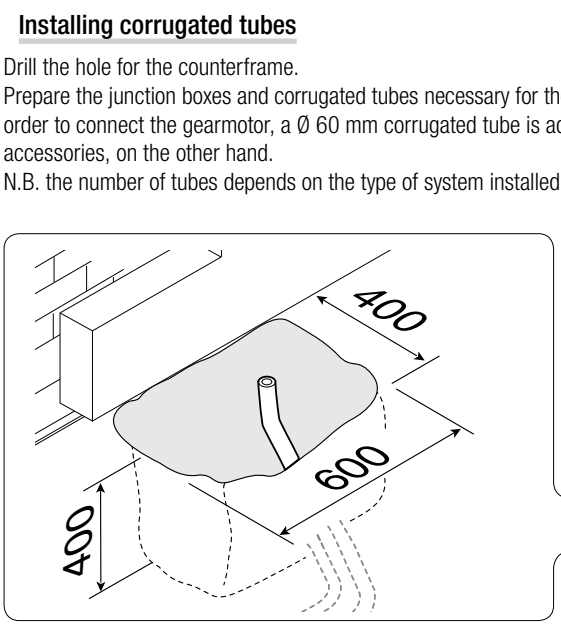


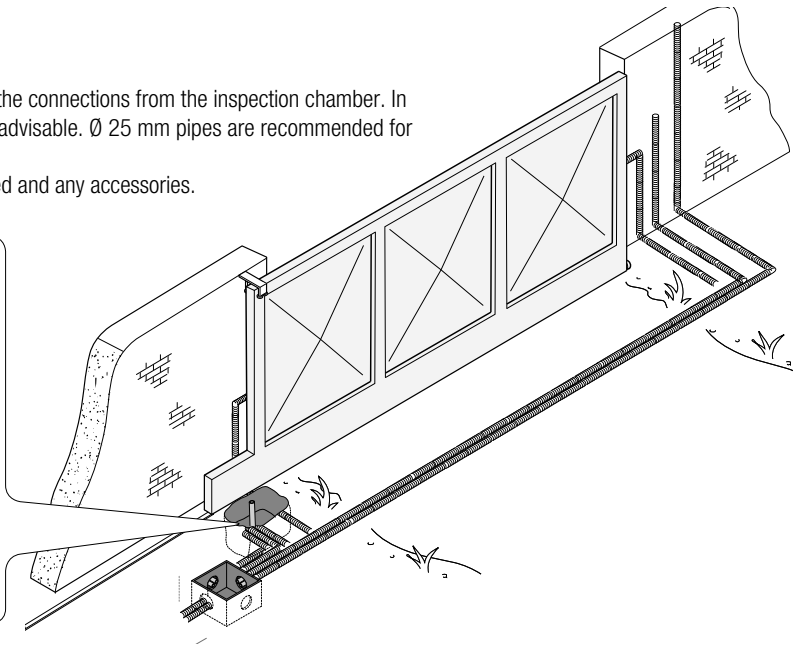
INSTALLATION

⚠ The following illustrations are only examples, given that the space for securing the operator and accessories varies depending on the overall dimensions. The installation technician is responsible for choosing the most suitable solution.

Installing corrugated tubes

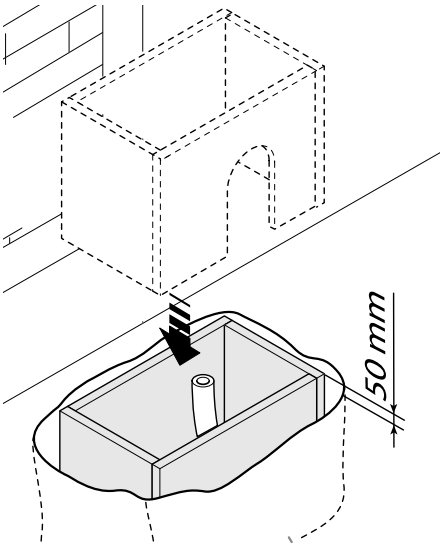
Drill the hole for the counterframe.
Prepare the junction boxes and corrugated tubes necessary for the connections from the inspection chamber. In order to connect the gearmotor, a Ø 60 mm corrugated tube is advisable. Ø 25 mm pipes are recommended for accessories, on the other hand.
N.B. the number of tubes depends on the type of system installed and any accessories.

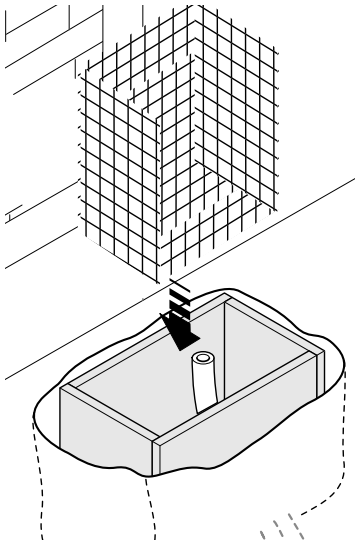


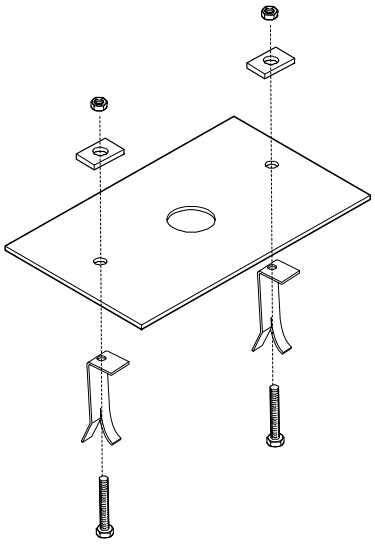


Installing the mounting plate

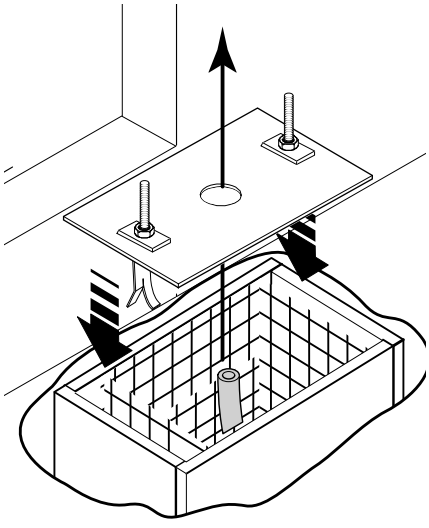
Prepare a counterframe that is larger than the mounting plate and place it in the hole. The counterframe must protrude 50 mm from ground level.
Insert an iron grid inside the counterframe to reinforce the concrete.
Secure the anchor brackets to the plate using the screws, nuts and washers supplied.

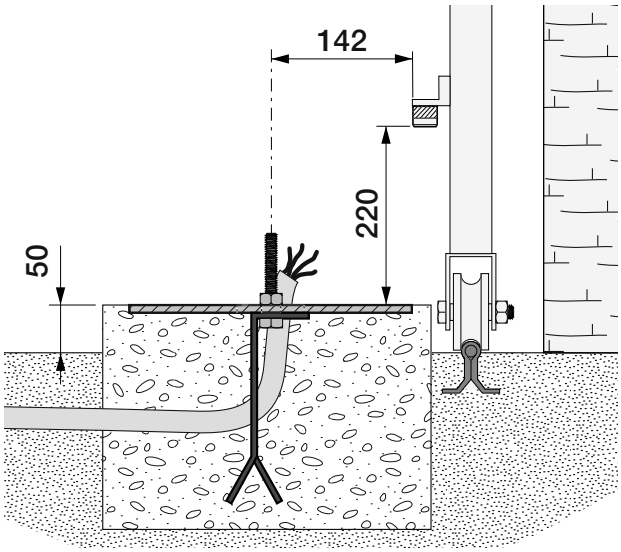




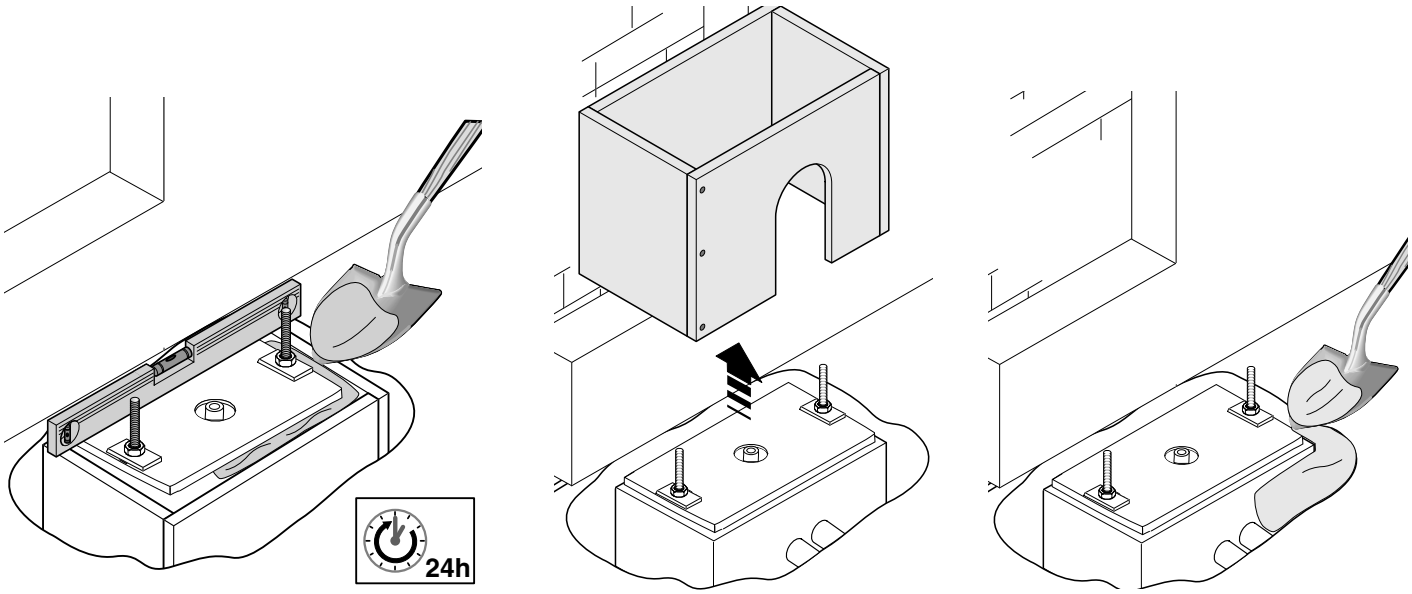


Position the mounting plate, respecting the measurements shown on the drawing, if the rack is already present.
Caution! The tube must pass through the prepared hole.

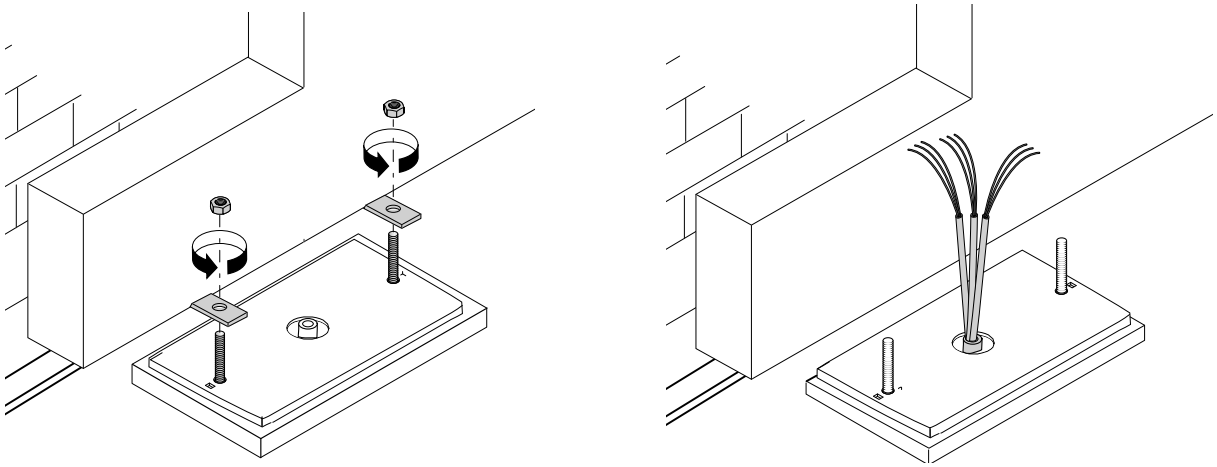




Fill the counterframe with cement. The plate must be perfectly level with the screw threads completely on the surface.
Allow to cure for at least.
Remove the counterframe and fill the hole around the block of cement with earth.

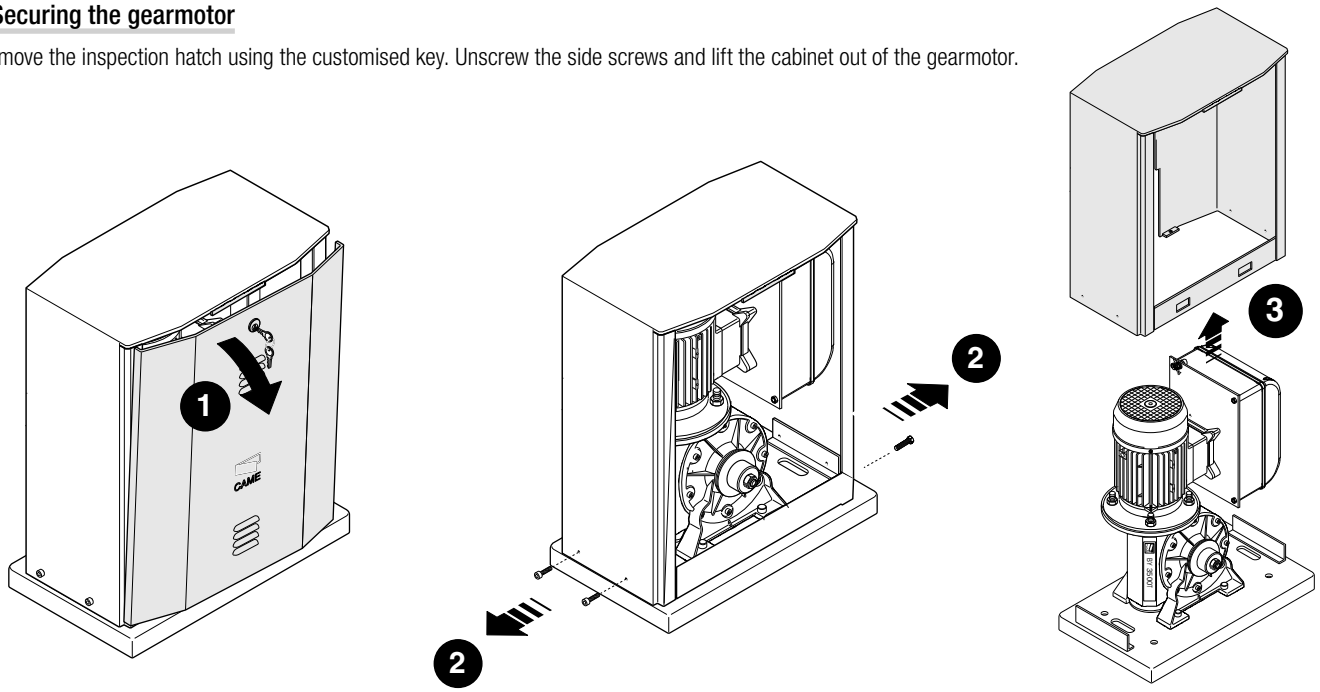


Remove the nuts and washers from the screws.
Insert the electric cables in the tube until they protrude by approximately 600 mm.

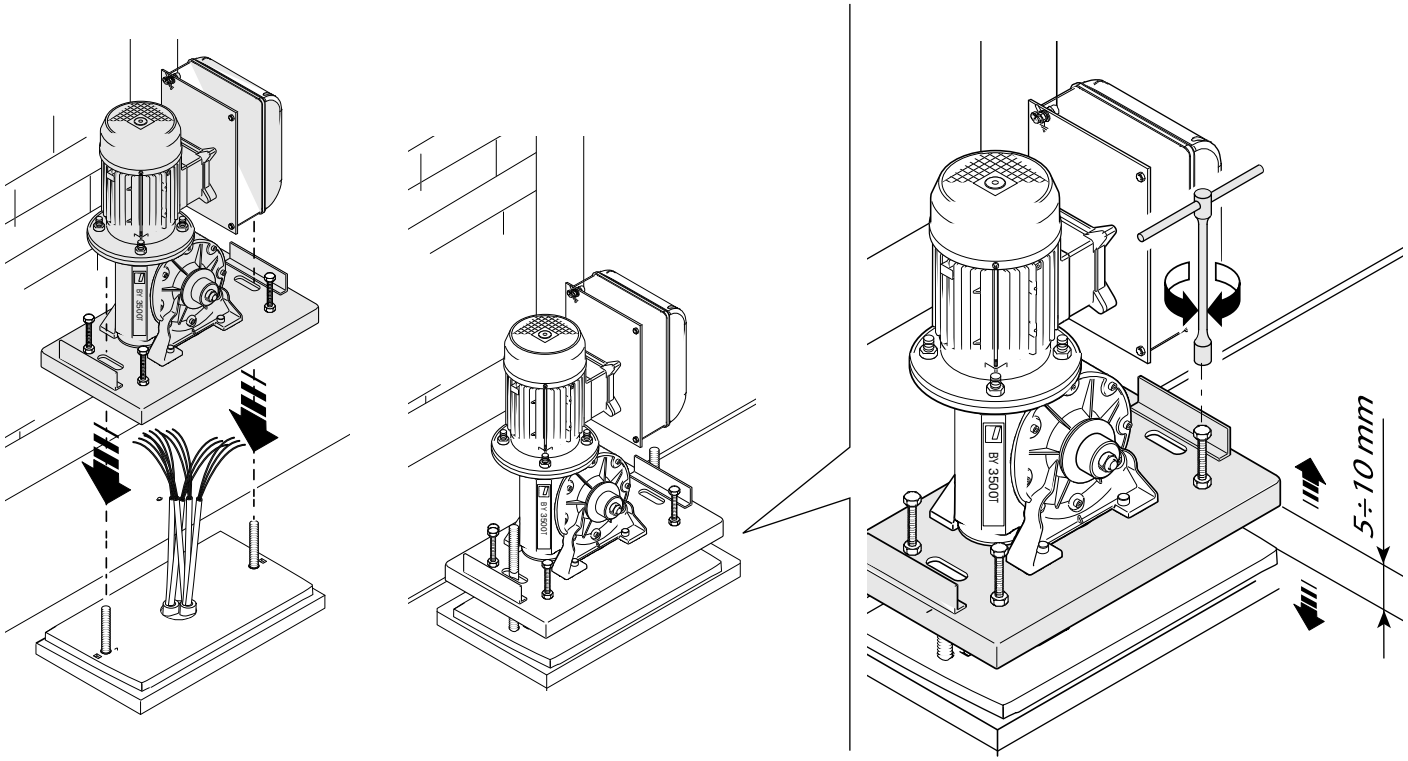


Securing the gearmotor

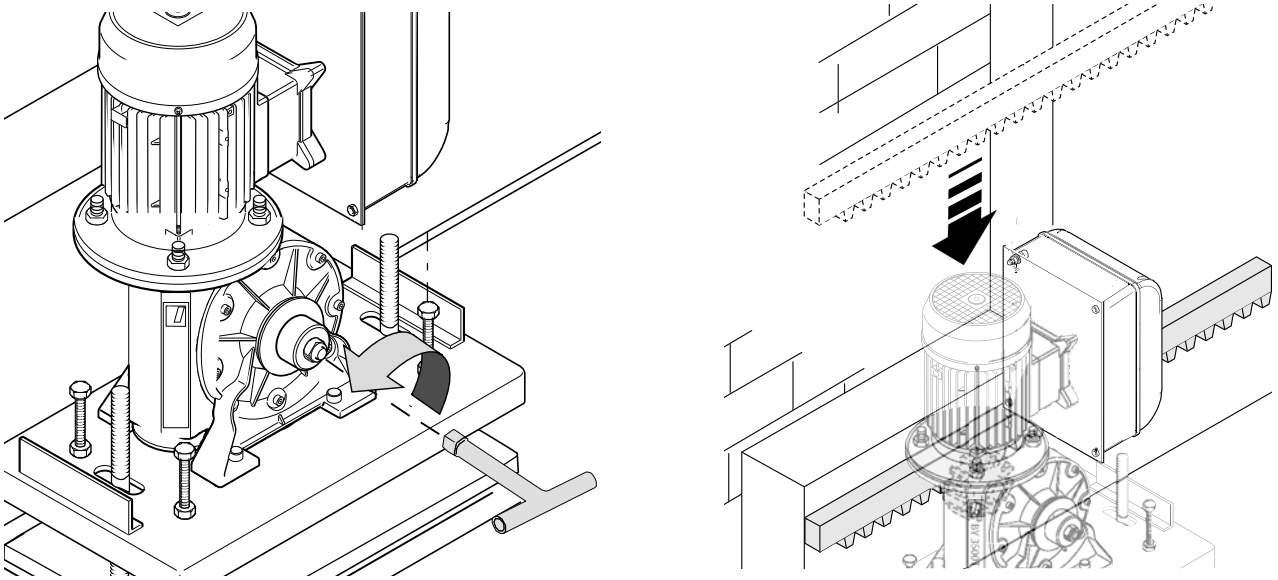
Remove the inspection hatch using the customised key. Unscrew the side screws and lift the cabinet out of the gearmotor.



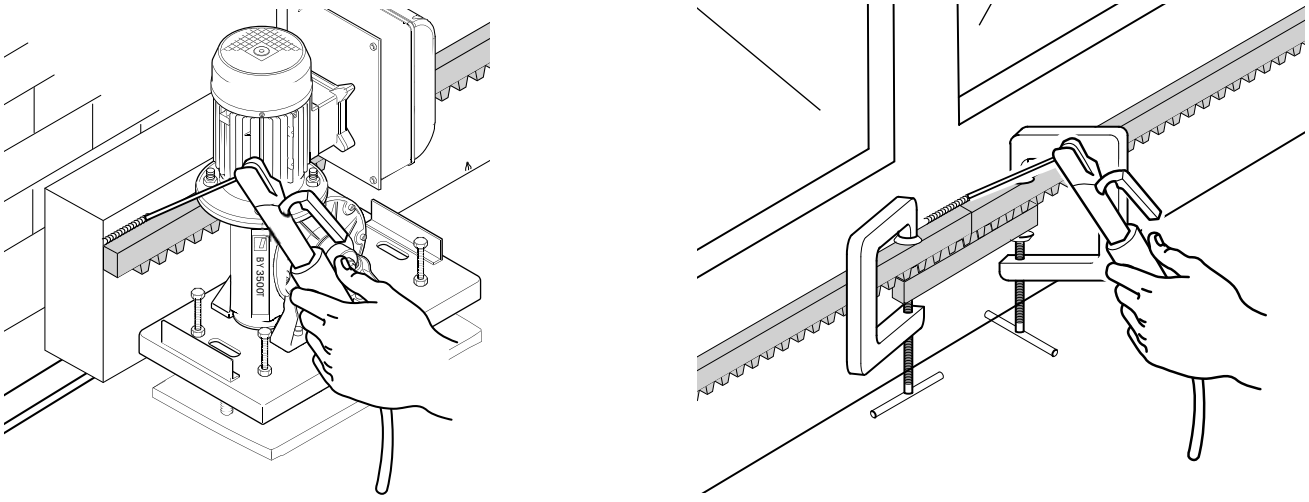
Position the gearmotor above the mounting plate. Caution! The electrical cables must pass under the gearmotor box.
Lift the gearmotor 5 to 10 mm up from the plate, using the threaded steel feet for any subsequent adjustments between the pinion and the rack.



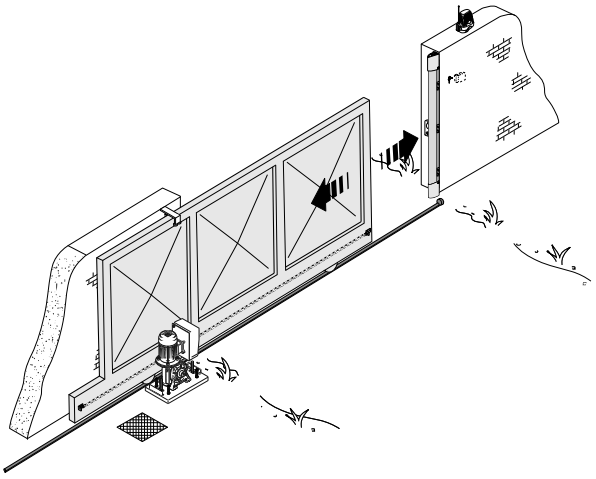
Unlock the gearmotor. Rest the rack on top of the gearmotor pinion.

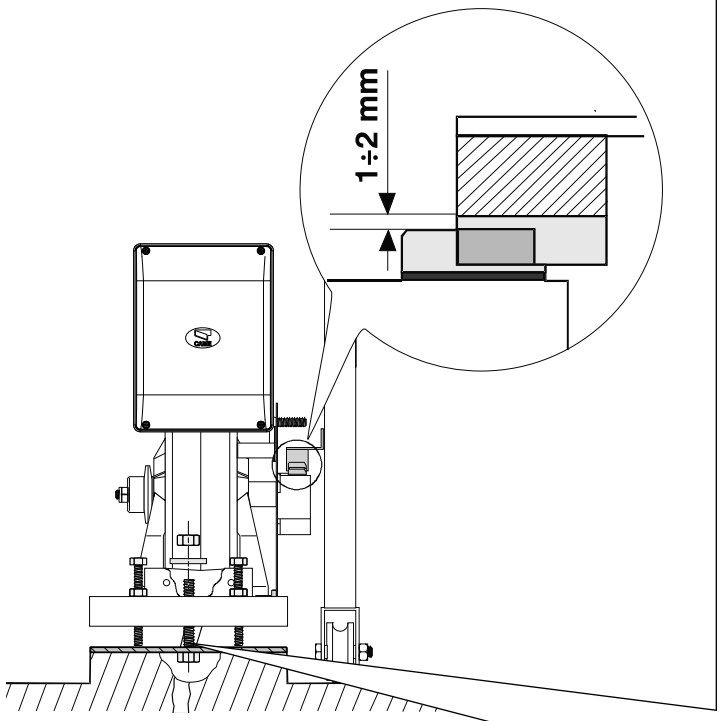


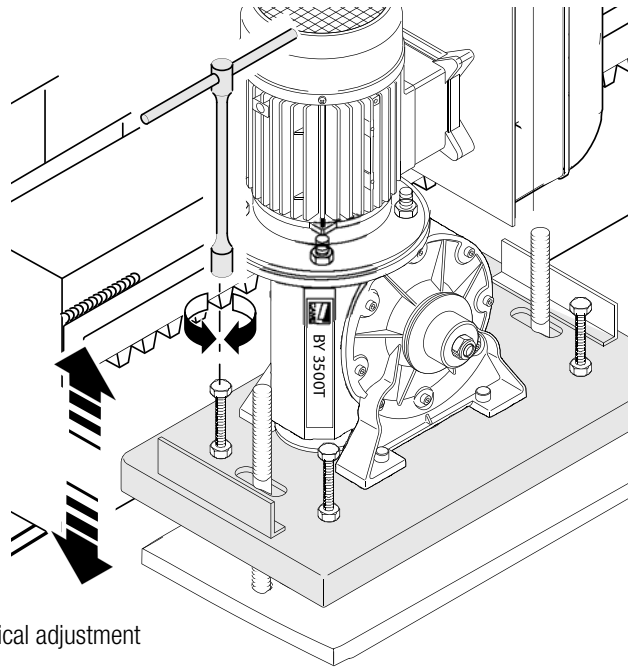
Weld or secure the rack to the gate along its entire length.
Assemble the rack modules by using a piece of scrap placed under the join point, securing it using two terminals.
N.B. if the rack is already present, proceed directly with adjusting the pinion/rack coupling distance.



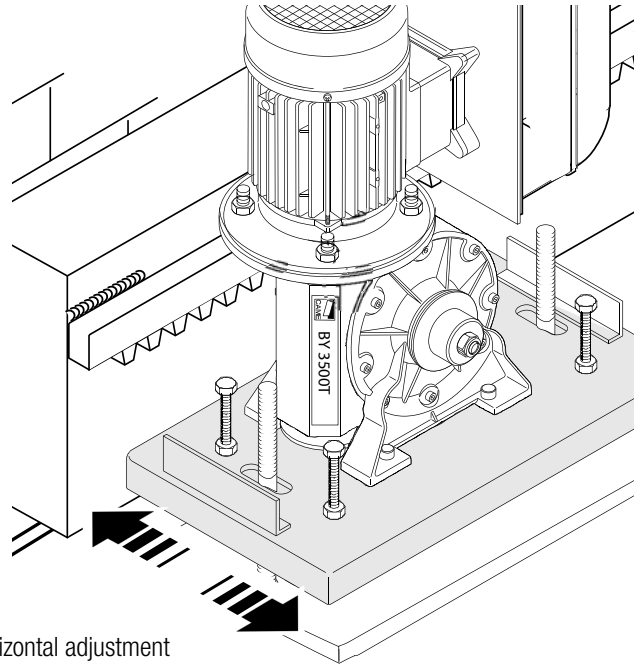
Open and close the gate manually and adjust the pinion/rack coupling distance using the threaded feet (vertical adjustment) and the slots (horizontal adjustment). This prevents the weight of the gate bearing upon the operator.





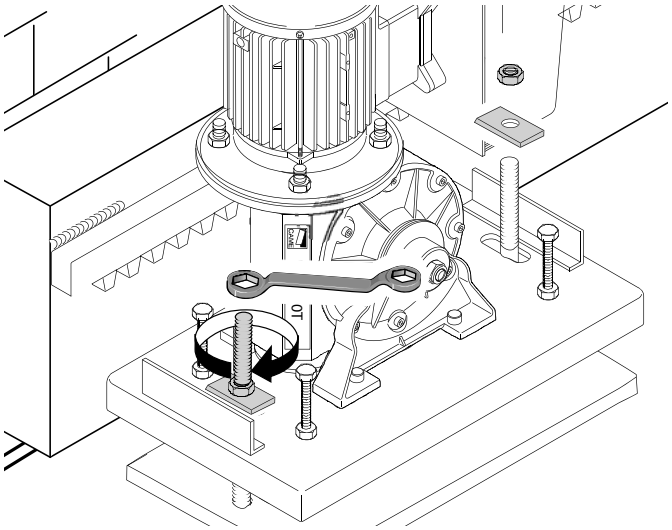


Vertical adjustment



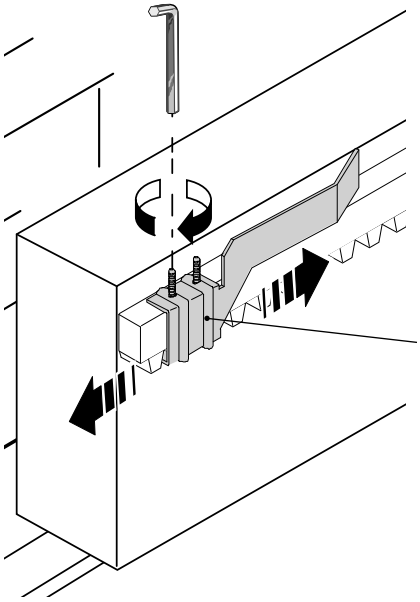
Horizontal adjustment

When adjustment is complete, secure the gearmotor to the plate using the washers and nuts.

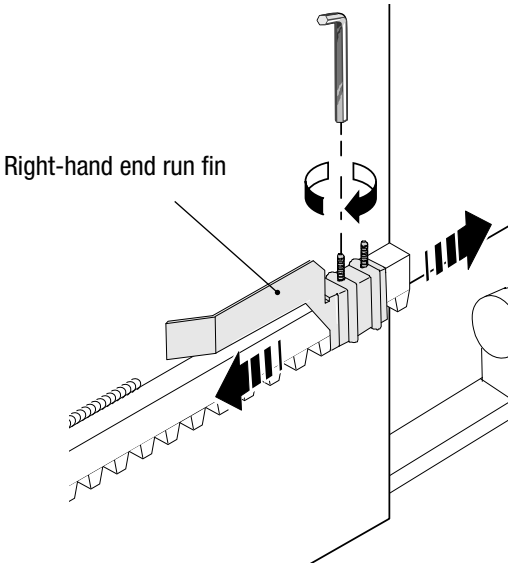


Determining the end run points

Position the end run fins on the rack and secure them using the 3 mm hex key. Their position limits the gate run.
N.B. ensure that the gate does not strike against the mechanical stop during opening or closing.



Left-hand end run fin



ELECTRICAL CONNECTIONS

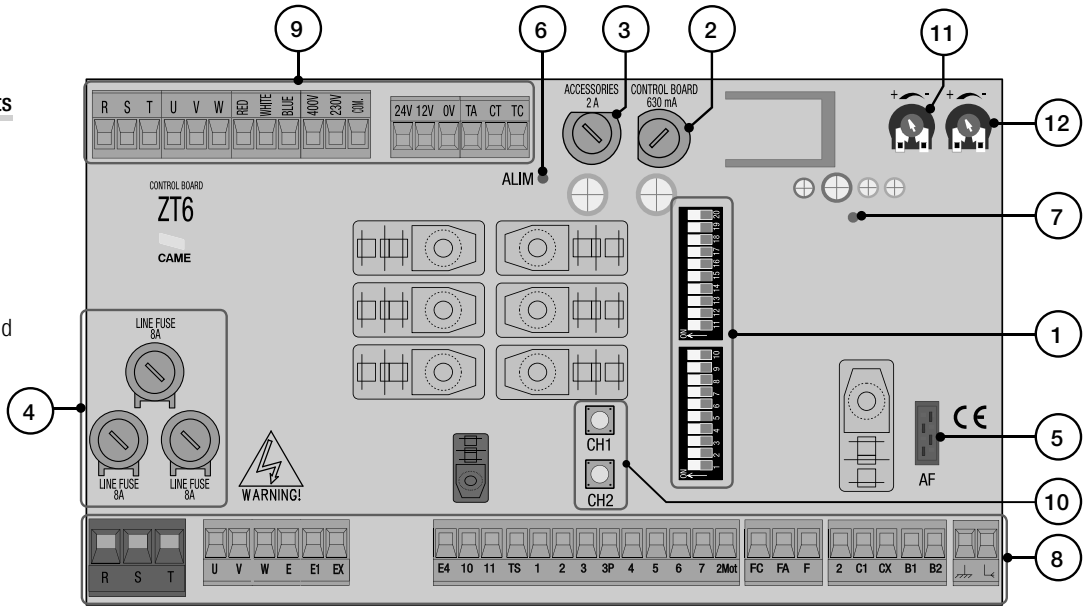
⚠ **Caution! Before intervening on the control panel, disconnect mains power.**

Control board power supply: 230/400 VAC three-phase, with frequency of 50-60 Hz.
Control device power supply: 24 VAC.
⚠ The total power of the accessories should not exceed 40 W.
The functions must be set using the dip switches and the adjustments using the trimmers.
All the connections are protected by quick fuses.

FUSE TABLE	
Line fuses	8 A-F
Panel fuse	630 mA-F
Accessory fuse	2 A-F

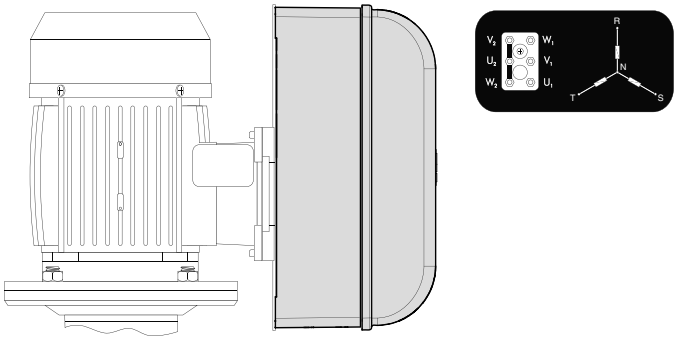
Description of the components

1. Dip switch
2. Panel fuse
3. Accessory fuse
4. Line fuses
5. Connector for AF card
6. Power indicator LED
7. Programming indicator LED
8. Terminal block for control and safety devices
9. Transformer terminal block
10. Radio code memorisation buttons
11. ACT trimmer: adjusting the automatic closing time
12. PART.OP. trimmer: adjusting partial opening

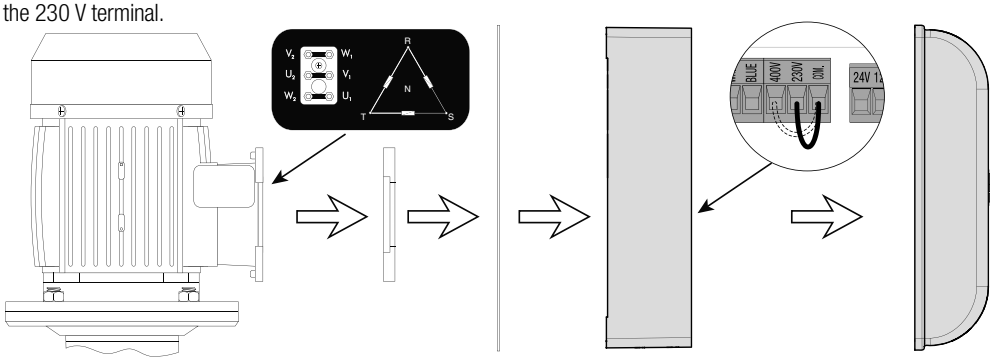


Power supply

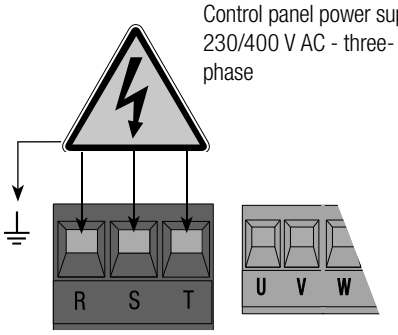
The gearmotor is designed to be powered at 400 V three-phase.



With 230 V three-phase power supply.
Remove the control panel, the mounting bracket and the connection cover.
Changing the connections of the gearmotor contacts. Replace the control panel and, on the control board, move the short circuit bridge from the 400 V terminal to the 230 V terminal.

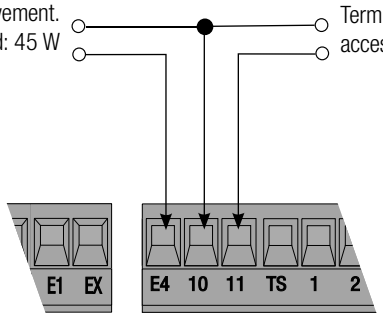


Control panel power supply 230/400 V AC - three-phase



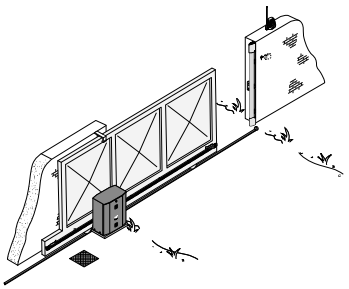
24 VAC output in movement.
Overall power permitted: 45 W

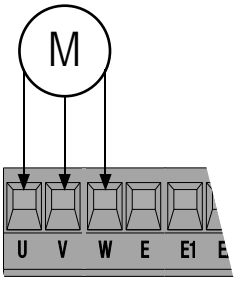
Terminals for powering the accessories at 24 VAC.

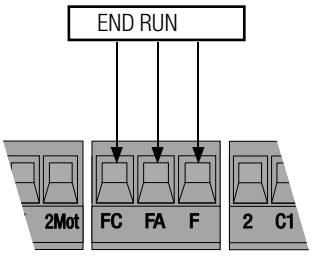


Connecting the gearmotor and end run

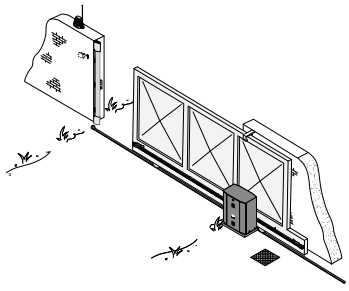
The motor is designed to be installed on the left, inside view.

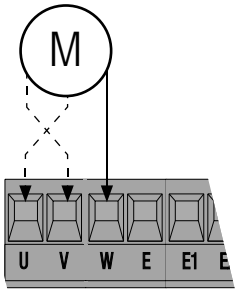


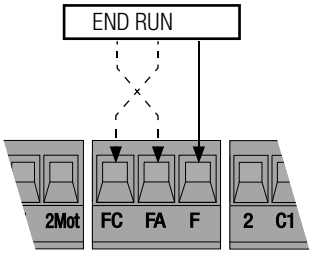




If installing on the right, inside view, reverse the motor and end run terminals on the control panel.







Control devices

Stop button (N.C. contact) Stops the gate with the exclusion of automatic closing. To resume movement, press the control button or other control device.

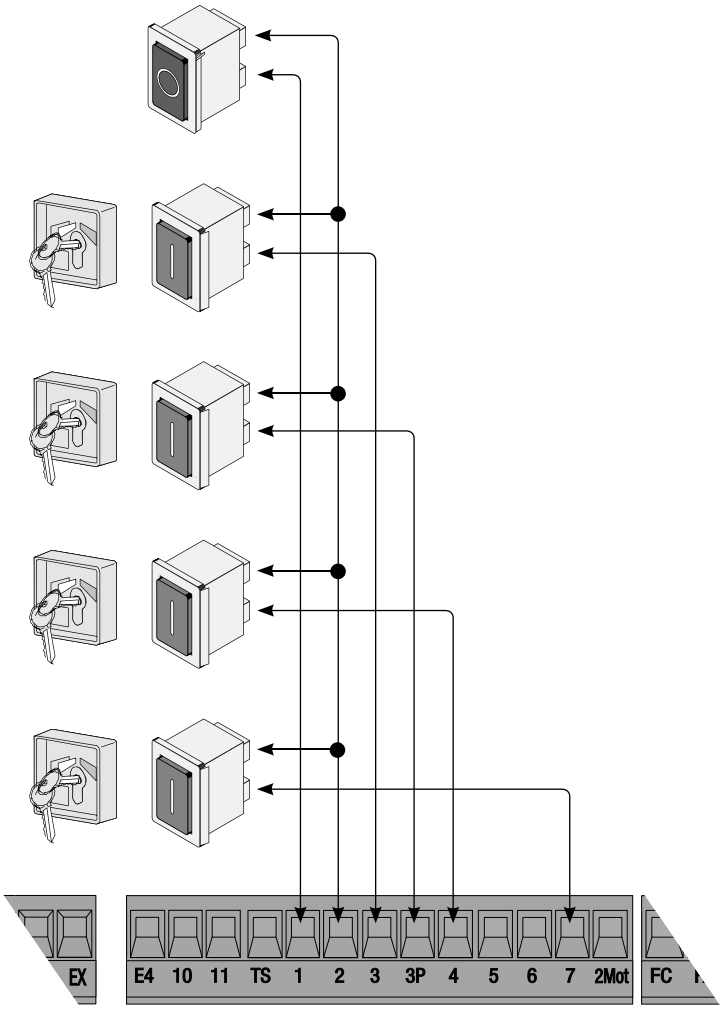
N.B. if not used, set dip switch 10 to ON.

OPEN ONLY function from the control device (N.O. contact)

PARTIAL OPENING function from the control device (N.O. contact)

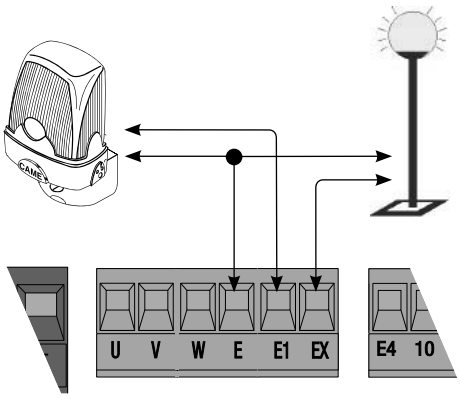
CLOSE ONLY function from the control device (N.O. contact)

OPEN-STOP-CLOSE-STOP (sequential) function / OPEN-CLOSE-REVERSE (step-by-step) from the control device (N.O. contact)
See dip switch 2 and 3 function selection.



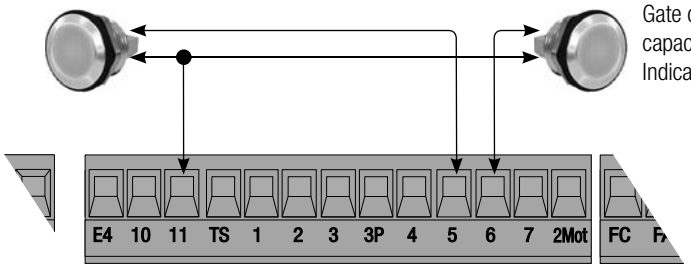
Indicator and lighting devices

Flashing light (Contact rated for: 230 V AC - 25 W max.).
Flashes during gate opening and closing.



Cycle/courtesy lamp (Contact capacity: 230 V - 60 W max.).
With dip switch 16 set to OFF and dip switch 17 set to ON = Cycle lamp.
Lights the area of operation. It remains on from the start of gate opening to complete closing (including the automatic closing time).
With dip switch 16 set to ON and dip switch 17 set to OFF = Courtesy lamp.
Lights the area of operation; stays on for a set time of 330 seconds after an opening command.

Gate open indicator light (contact capacity: 24 V - 3 W max.)
Indicates that the gate is open.



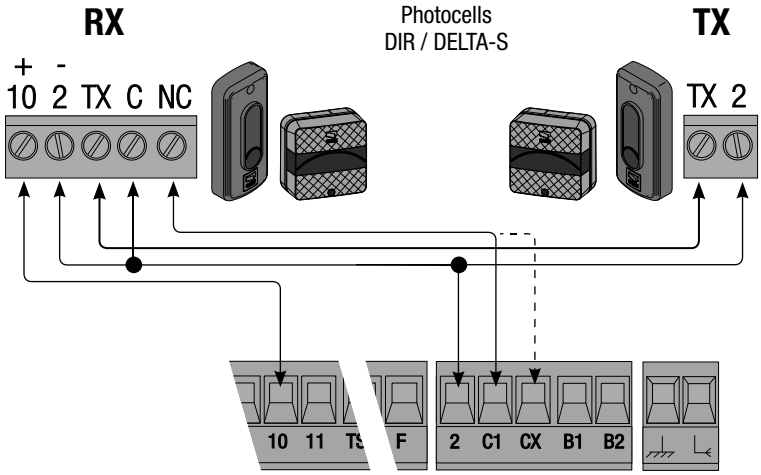
Gate closed indicator light (contact capacity: 24 V - 3 W max.)
Indicates that the gate is closed.

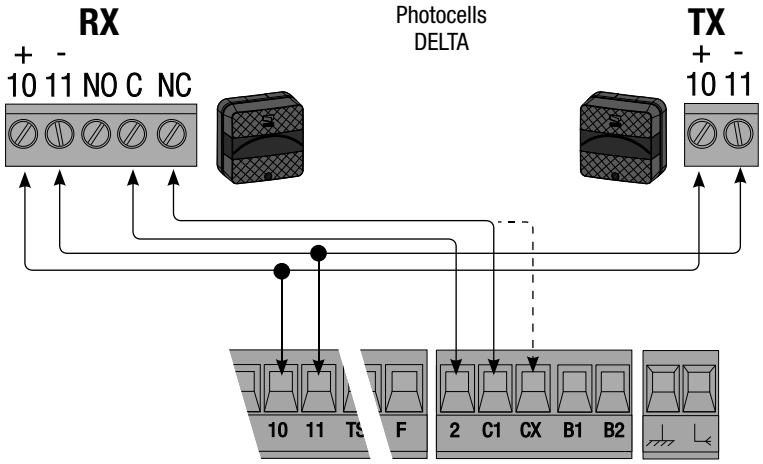
Safety devices

C1 = Contact (N.C.) for reopening during closing.
Input for safety devices such as photocells, sensitive edges and other devices compliant with the EN 12978 standard.
While the operator is closing, the opening of the contact causes the reversal of the direction of movement until completely open.
If C1 is not used, set dip switch 7 to ON.

CX with dip switch 8 and dip switch 9 OFF = Contact (N.C.) for reclosing during opening.
Input for safety devices such as photocells, sensitive edges and other devices compliant with the EN 12978 standard.
While the operator is opening, the closing of the contact causes the reversal of the direction of movement until completely closed.

CX with dip switch 8 OFF and dip switch 9 ON = Contact (N.C.) for partial stop.
Input for safety devices such as photocells, sensitive edges and other devices compliant with the EN 12978 standard.
Stops the operator, if it is moving, and then sets automatic closing.
If CX is not used, set dip switch 8 to ON.

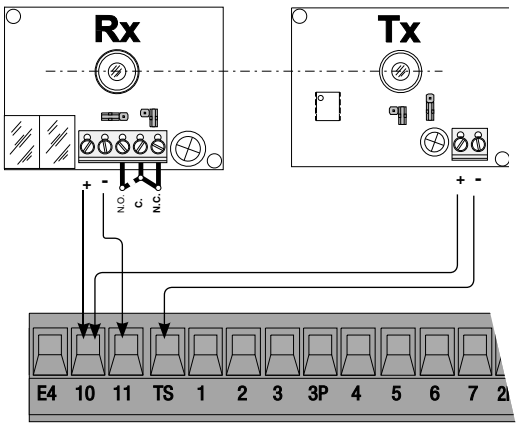




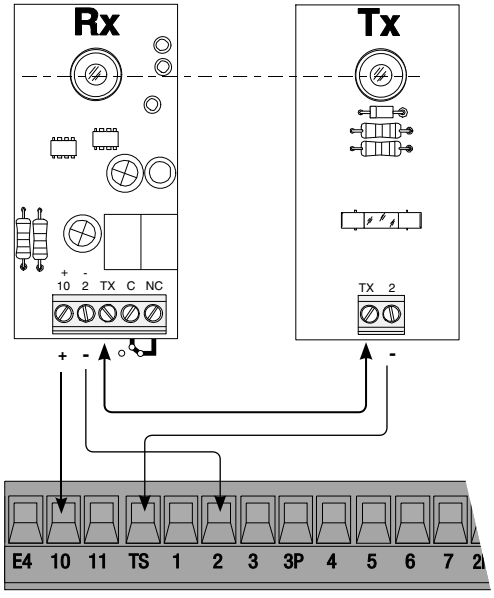
Photocell safety connection

With each opening or closing command, the panel checks that the photocells work. Any anomaly inhibits any command.
Set dip switch 13 to ON.

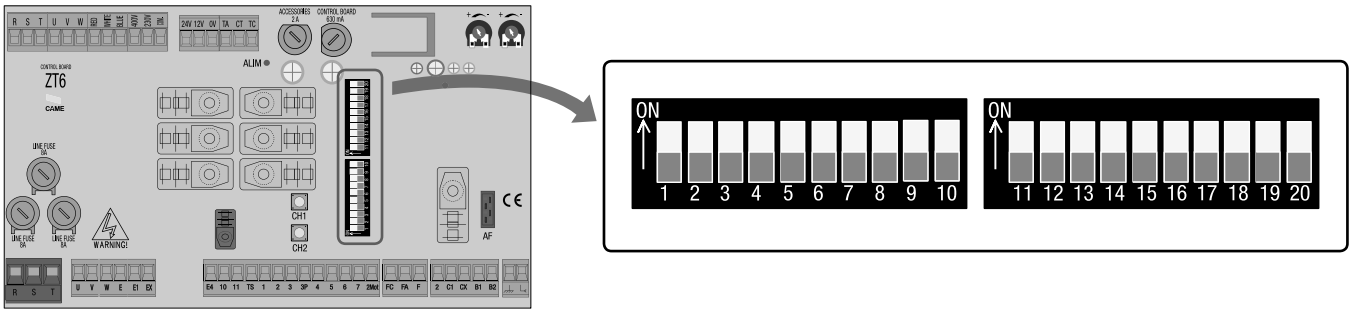
DELTA



DIR / DELTA S

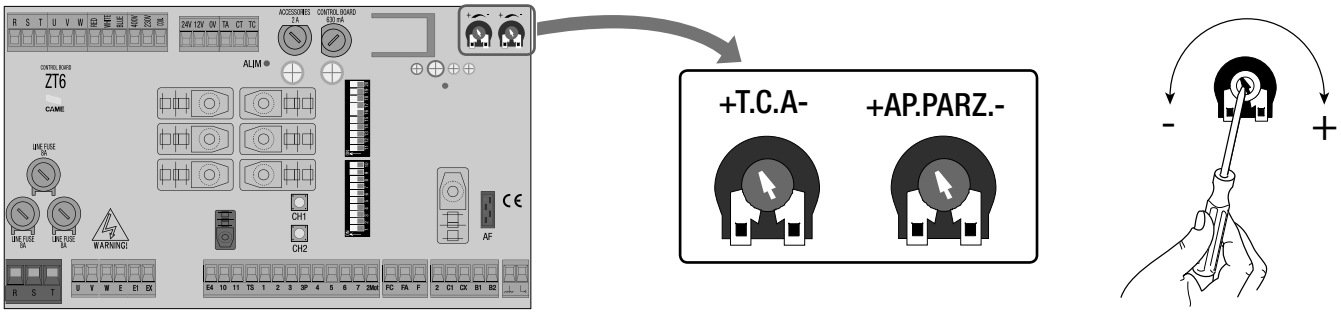


Selecting the functions



1 ON	-	AUTOMATIC CLOSING function activated
2 ON	-	OPEN-STOP-CLOSE-STOP function from the transmitter and/or the button (2-7) activated
2 OFF	-	OPEN-CLOSE function from the transmitter and/or the button (2-7) activated
3 ON	-	OPEN ONLY function from the transmitter activated
4 ON	-	HOLD-TO-RUN function activated
5 ON	-	PRE-FLASHING during opening and closing activated
6 ON	-	OBSTACLE DETECTION function activated
7 OFF	-	REOPENING during closing (2-C1) function activated
8 OFF / 9 OFF	-	RECLOSING during opening (2-CX) function activated
8 OFF / 9 ON	-	PARTIAL STOP function (2-CX) activated; (if the devices are not connected on 2-CX, set dip switch 8 to ON)
10 OFF	-	TOTAL STOP function with button (1-2) activated
11	-	Not used, keep the dip switch in the OFF position
12 ON	-	PARTIAL OPENING function activated; automatic closing occurs after a set time of 8 seconds.
12 OFF	-	PARTIAL OPENING function activated; automatic closing, if envisaged, occurs after a time that can be set at between 1 and 14 seconds using the trimmers.
13 ON	-	Safety test function to check photocell efficiency activated; (13 OFF - disabled)
14	-	Not used, keep the dip switch in the OFF position
15	-	Not used, keep the dip switch in the OFF position
16 ON	-	COURTESY LAMP function activated
17 ON	-	CYCLE LAMP function activated
18	-	Not used, keep the dip switch in the OFF position
19	-	Not used, keep the dip switch in the OFF position
20	-	Not used, keep the dip switch in the OFF position

Adjustments



ACT trimmer	-	Adjustment of the AUTOMATIC CLOSING time: from a minimum of 1 second to a maximum of 120 seconds.
PART.OP. trimmer	-	Adjustment of the PARTIAL OPENING time from a minimum of 1 second to a maximum of 14 seconds.

Activating the radio control

Connect the antenna RG58 cable to the terminals and any accessory to connect to the B1-B2 output (N.O. contact) ❶.

For the AF43S / AF43SM radiofrequency cards only, position the jumper as shown according to the series of transmitters used ❷.

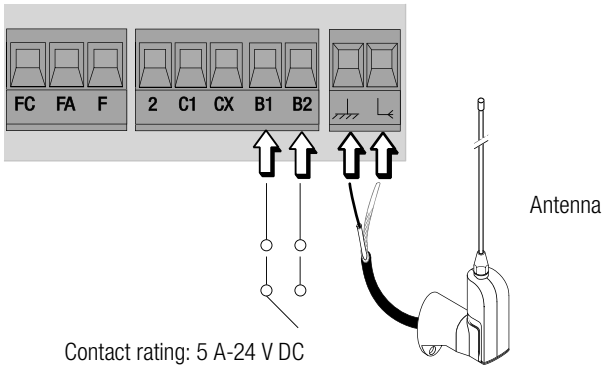
DISCONNECT POWER AND REMOVE THE BATTERIES, IF PRESENT. Insert the AF card on the control board.
N.B. the control board only recognises the AF card when the operator is powered again❸.

Hold down the CH1 key on the control board: the LED indicator flashes. Press a key on the transmitter to send the code. The LED will remain lit to indicate SUCCESSFUL memorisation ❹.

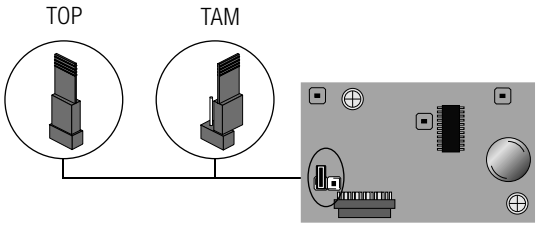
Follow the same procedure with the CH2 key, associating it with another transmitter key ❺.

CH1 = channel for direct control of a panel function (OPEN ONLY, OPEN-CLOSE-REVERSE or OPEN-STOP-CLOSE-STOP, according to the selection made on dip switches 2 and 3).
CH2 = channel for commands directed to an accessory device connected on B1-B2 or for connecting two coupled motors having a single command.

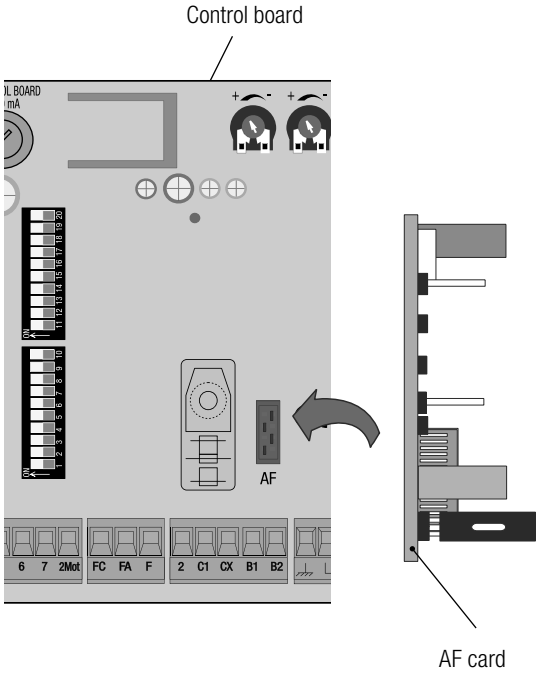
❶



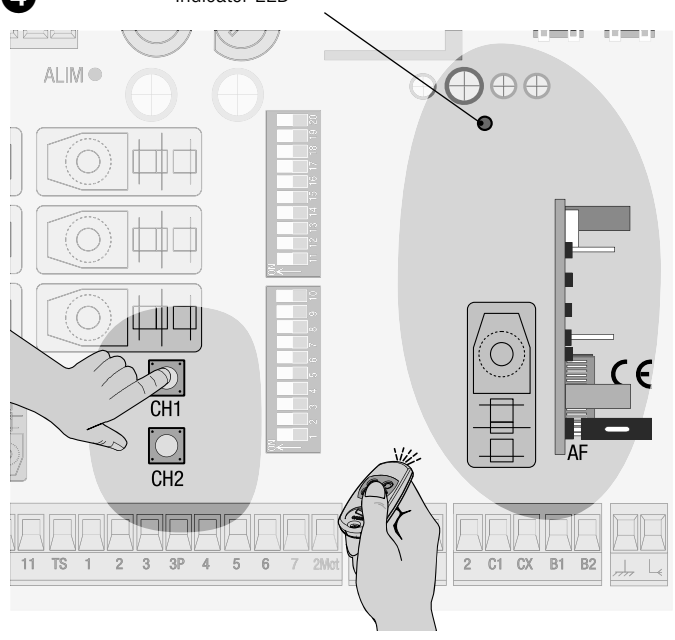
❷



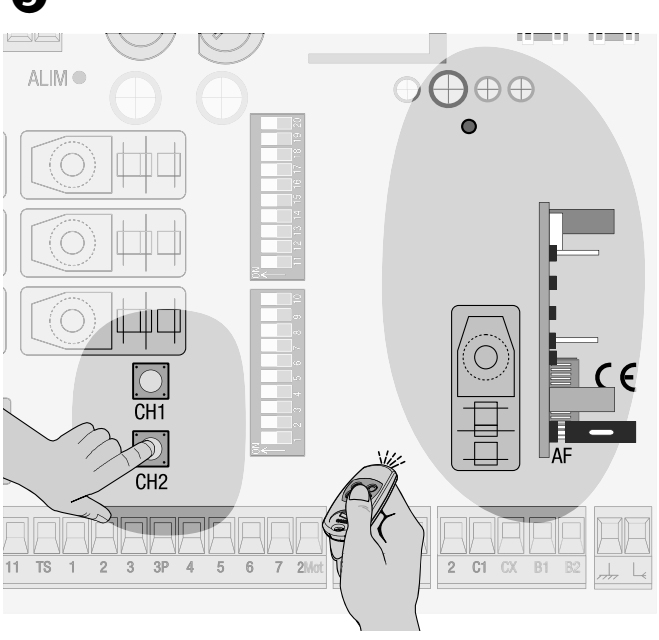
❸



❹

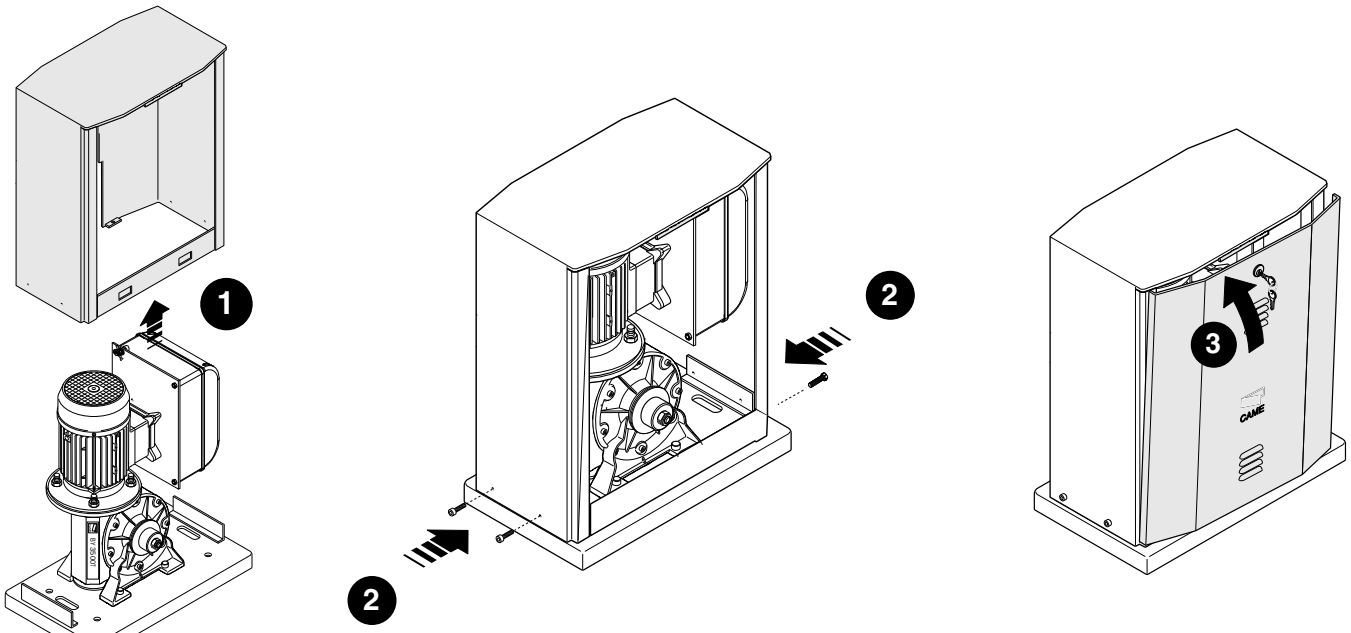


❺



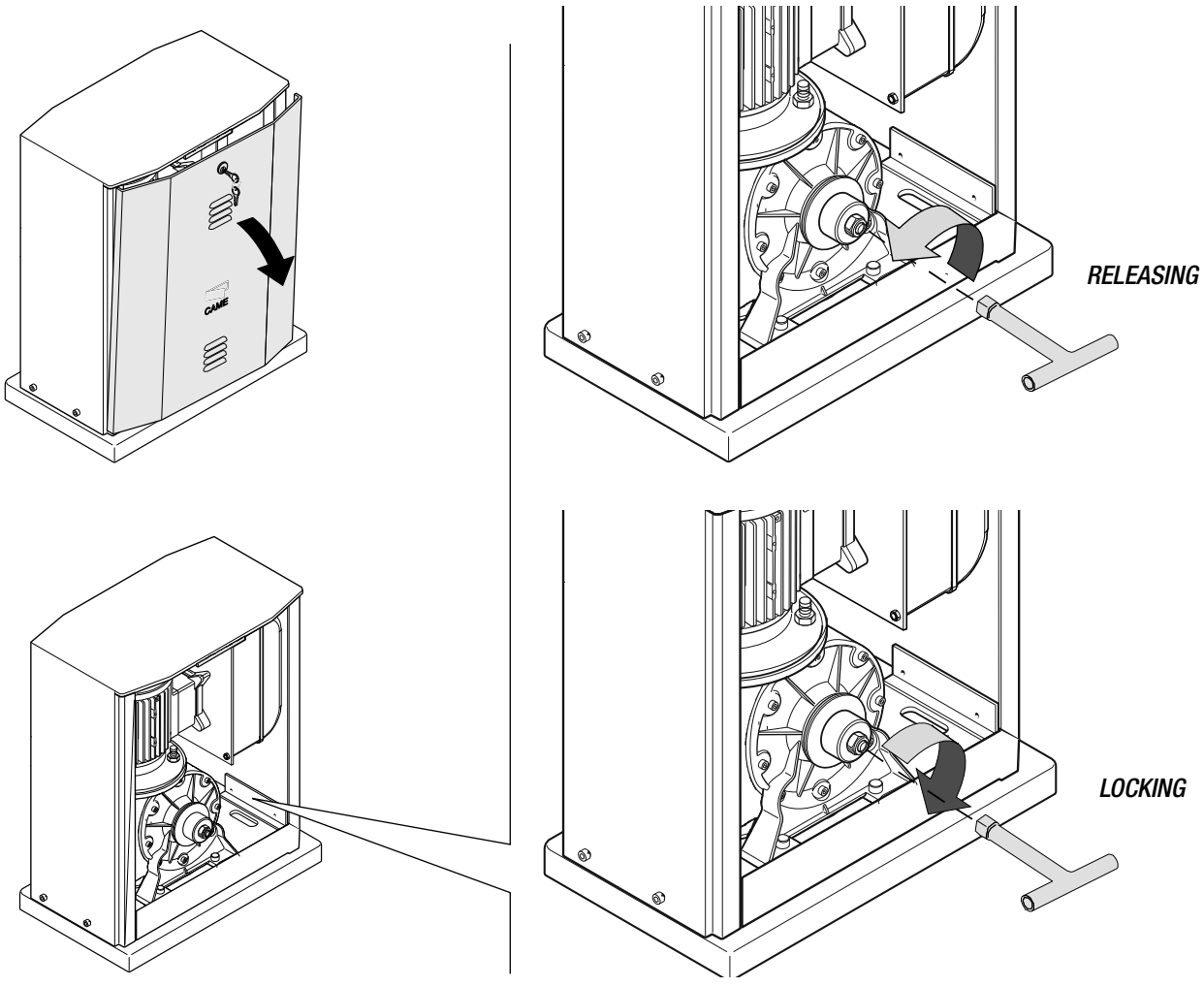
Securing the cover

After making the electrical connections and selecting the functions and adjustments, fit the cabinet on the gearmotor and secure it.



Releasing the gearmotor

⚠ The operation must be carried out while the power is off.



CONNECTING TWO COUPLED GEARMOTORS HAVING A SINGLE CONTROL

With two coupled gearmotors, you can command only the opening (by button and/or radio control): the gate will close only in automatic closing mode.

1 Coordinate the direction of travel of the two gearmotors Ⓐ and Ⓑ, by modifying the motor's rotation Ⓑ (invert the cables on terminals FA-FC and U-V).

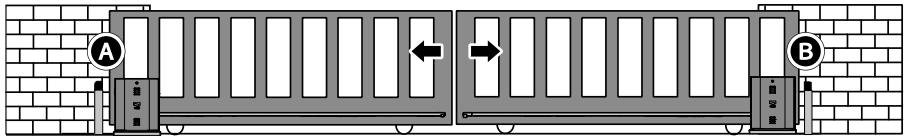
2 Make the electrical connections only on the motor's control board Ⓐ. Whereas, the adjustments and features, must be made on both boards.

3 Connect the two boards together, as illustrated. Set DIP 1 and 3 to ON on both boards.

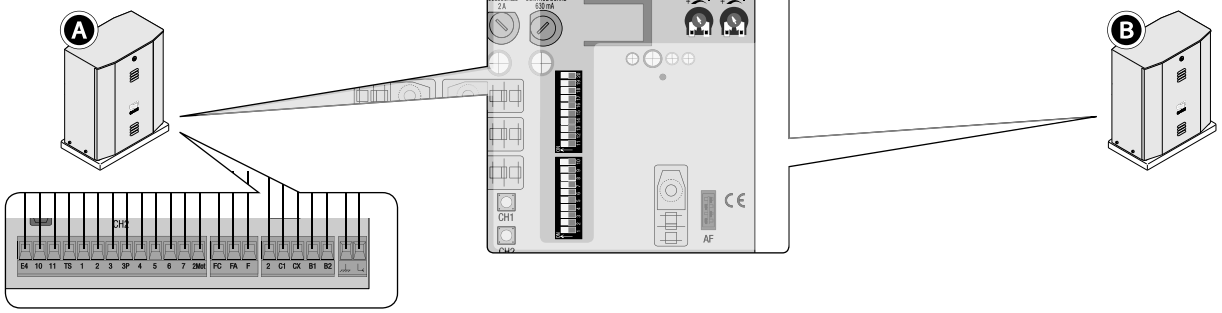
4 Fit the AF board only into the gearmotor's board Ⓐ.

📖 The transmitter button for opening a gate must be memorized on the gearmotor's channel CH1 Ⓐ. The transmitter button for opening both gates must be memorized on the gearmotor's channel CH2 Ⓐ.

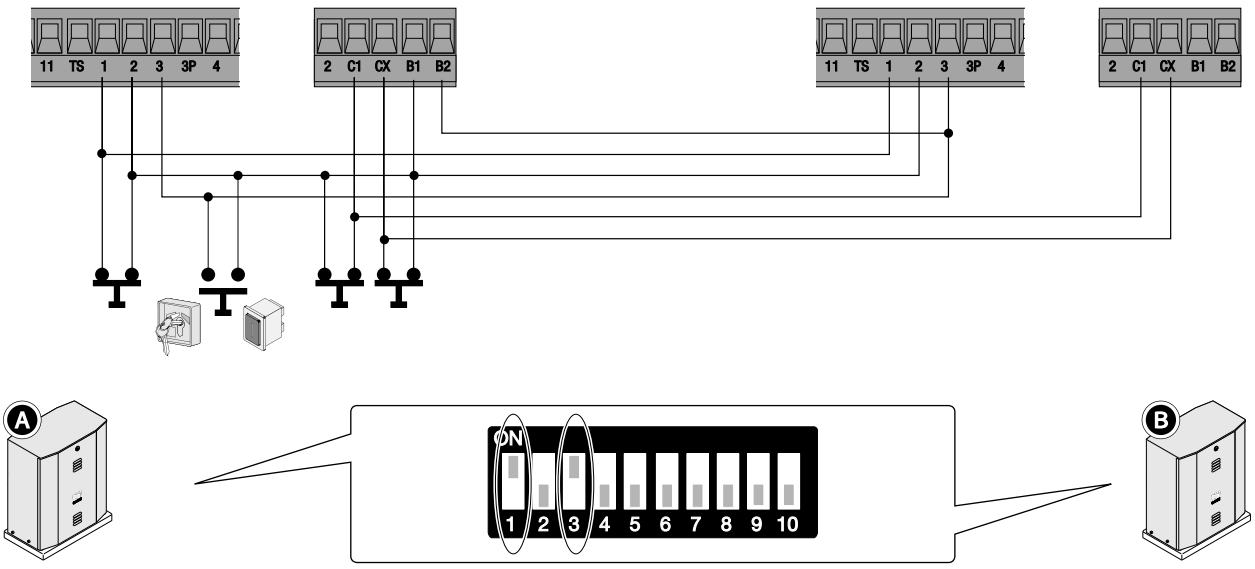
1



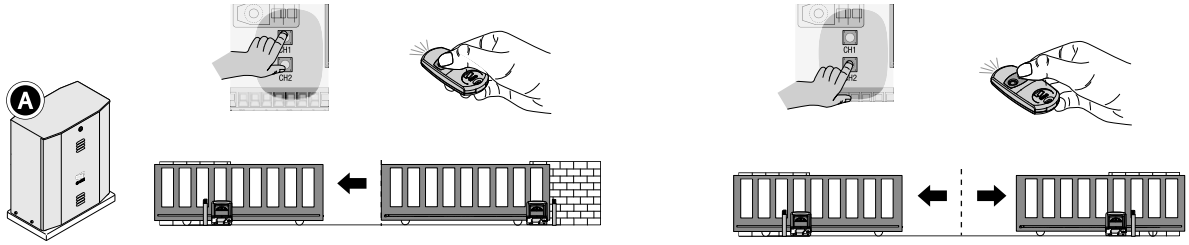
2



3

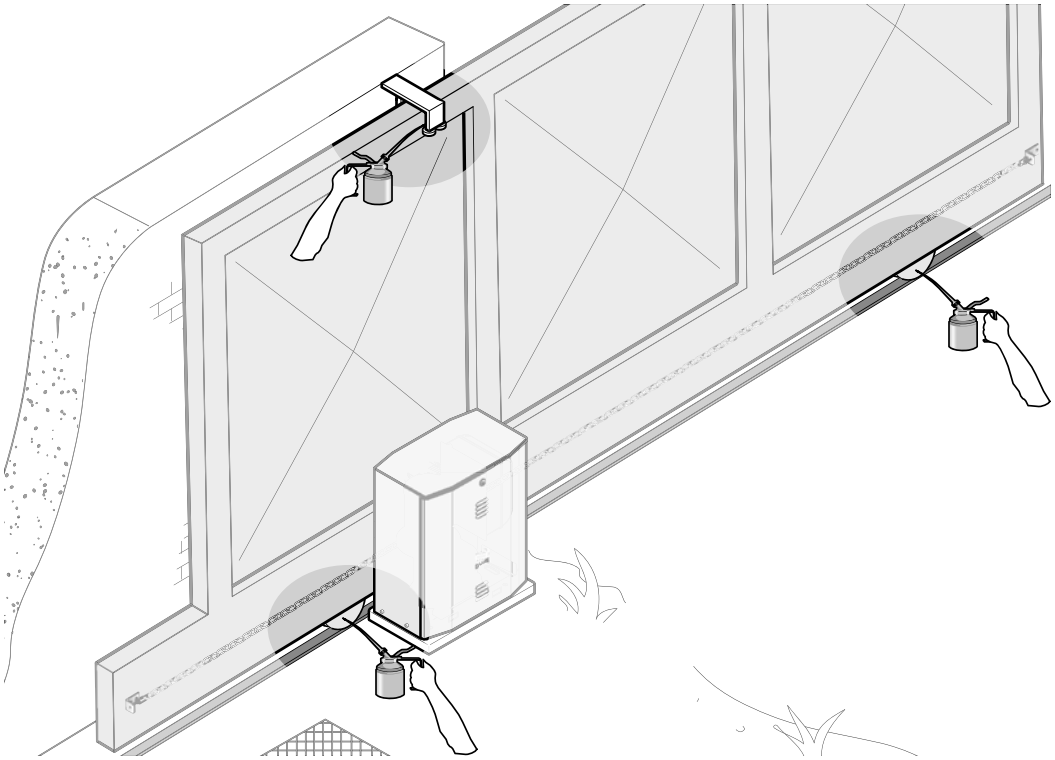


4



MAINTENANCE

☞Before any maintenance, disconnect line voltage to prevent any possible dangerous situations that can be caused by accidental movement of the operator. Lubricate the rotation points with grease whenever abnormal vibrations or squeaking occurs, as shown below.



Periodic maintenance

Periodic maintenance log to be completed by the user (every six months)

Date	Notes	Signature

Extraordinary maintenance

⚠The table below is used to note any extraordinary maintenance, repairs or improvements carried out by specialist companies.
⚠ Extraordinary maintenance must be carried out by specialist technicians.

Extraordinary maintenance log

Installation technician stamp	Operator name
	Date of intervention
	Technician signature
	Customer signature
Intervention carried out _____	

Installation technician stamp	Operator name
	Date of intervention
	Technician signature
	Customer signature
Intervention carried out _____	

TROUBLESHOOTING

MALFUNCTIONS	POSSIBLE CAUSES	CHECKS AND REMEDIES
The gate does not open or close	• No power • The gearmotor is unlocked • The transmitter battery is flat • The transmitter is broken • The stop button is stuck or broken • The opening/closing button or the key selector switch are stuck • Photocell partial stop	• Check for mains power • Lock the gearmotor • Replace the batteries • Contact service • Contact service • Contact service • Contact service
The gate opens but does not close	• The photocells are engaged • Sensitive edge triggered	• Check that the photocells are clean and work correctly • Contact service
The gate closes but does not open	• Sensitive edge triggered	• Contact service

DISMANTLING AND DISPOSAL

☞ CAME S.p.A. applies a certified UNI EN ISO 14001 standard-compliant Environmental Management System at its premises to ensure the environment is safeguarded.
Please help us safeguard the environment. At CAME it is fundamental to our operating and market strategies. Simply follow these brief disposal guidelines:
♻ DISPOSING OF THE PACKAGING
The packaging materials (cardboard, plastic, and so on) should be disposed of as solid household waste, and simply separated from other waste for recycling.
Always make sure you comply with local laws before dismantling and disposing of the product.
DISPOSE OF RESPONSIBLY!
♻ DISMANTLING AND DISPOSAL
Our products are made of various materials. Most of these (aluminum, plastic, iron, electrical cables) is classified as solid household waste. They can be recycled by separating them before dumping at authorized city plants.
Whereas other components (control boards, batteries, transmitters, and so on) may contain hazardous pollutants.
These must therefore be disposed of by authorized, certified professional services.
Before disposing, it is always advisable to check with the specific laws that apply in your area.
DISPOSE OF RESPONSIBLY!

REFERENCE REGULATIONS

The product complies to the reference regulations in effect.

English *- Manual code:* ***FA00729-EN*** *v.* ***1*** *- 02/2017 -*

CAME
safety&comfort

CAME bpt URBACO
parkare go

CAME S.p.A.

Via Martiri Della Libertà, 15
31030 **Dosson di Casier**
Treviso - Italy
(+39) 0422 4940
(+39) 0422 4941

Via Cornia, 1/b - 1/c
33079 **Sesto al Reghena**
Pordenone - Italy
(+39) 0434 698111
(+39) 0434 698434

www. came.com