## 1 SYMBOLS USED IN THIS MANUAL

This manual uses symbols to highlight specific texts. The functions of each symbol are explained below:

⚠ **Failure to respect the safety warnings could lead to accident or injury.**

Ⓘ Work sequences or procedures.

☞ Important details which must be respected for correct assembly and operation.

🛈 Additional information to help the installer.

♻ Information on care for the environment.

## 2 IMPORTANCE OF THIS MANUAL

⚠ **Read this manual in its entirety before carrying out the installation, and obey all instructions. Failure to do so may result in a defective installation, leading to accidents and failures.**

🛈 Moreover, this manual provides valuable information which will help you to carry out installation more efficiently.

☞ This manual is an integral part of the product. Keep for future reference.

## 3 ENVISAGED USE

This device has been designed for installation as part of an automatic opening and closing system for swing gates.

⚠ **This device is not suitable for installation in inflammable or explosive environments.**

⚠ **Failure to install or use as indicated in this manual is inappropriate and hazardous, and could lead to accidents or failures.**

⚠ **The installer shall be responsible for ensuring the facility is set up for its envisaged use.**

## 4 INSTALLER'S QUALIFICATIONS

⚠ **The installation should be completed by a professional installer, complying with the following requirements:**

- **He/she must be capable of carrying out mechanical assemblies in doors and gates, choosing and implementing attachment systems in line with the assembly surface (metal, wood, brick, etc) and the weight and effort of the mechanism.**
- **He/she must be capable of carrying out simple electrical installations in line with the low tension regulations and applicable standards.**
- **He/she must be capable of carrying out simple masonry work (digging of pits, channels, preparation of cement).**

⚠ **The installation should be carried out bearing in mind standards EN 13241-1 and EN 12453.**

## 5 AUTOMATIC GATE SAFETY ELEMENTS

This device complies with all current safety regulations. However, the complete system comprises, apart from the operator referred to in these instructions, other elements which should be acquired separately.

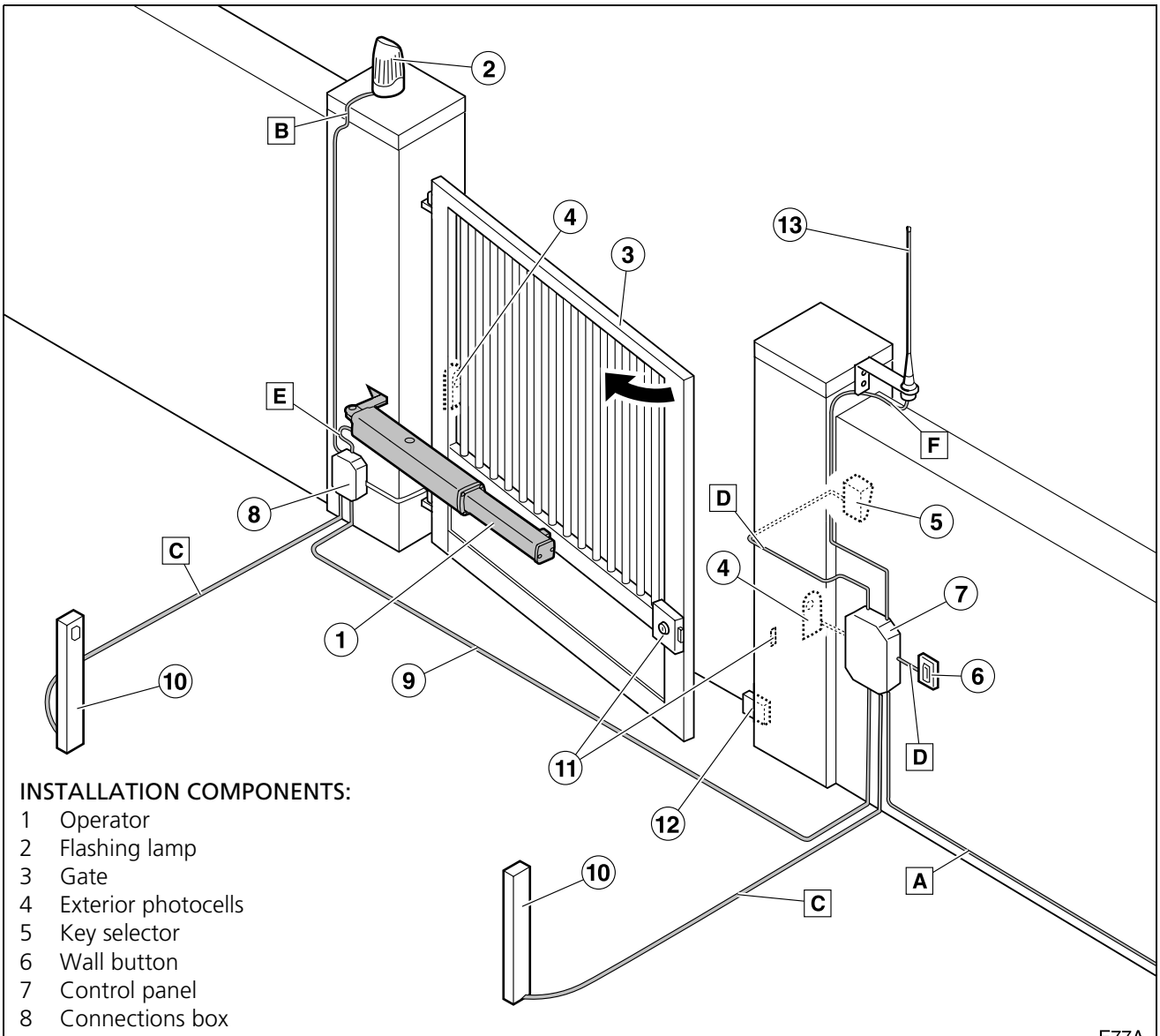
☞ The safety of the complete installation depends on all the elements installed. Install only Erreka components in order to guarantee proper operation.

⚠ **Respect the instructions for all the elements positioned in the installation.**

⚠ **We recommend installing safety elements.**

🛈 For further details, see *"Fig. 1 Elements of the complete installation"* on page 39.

## 1 ELEMENTS OF THE COMPLETE INSTALLATION




INSTALLATION COMPONENTS:

1 Operator
2 Flashing lamp
3 Gate
4 Exterior photocells
5 Key selector
6 Wall button
7 Control panel
8 Connections box
9 Electrical installation
10 Interior photocells
11 Electrolock
12 In-ground central stop
13 Antenna

ELECTRICAL CABLING:

| Element | Nº threads x section | Maximum length |
|---|---|---|
| A: General power supply | 3x1.5mm$^2$ | 30m |
| B: Flashing lamp | 2x0.5mm$^2$ | 20m |
| C: Photocells | 2x0.5mm$^2$ | 30m |
| D: Key selector | 2x0.5mm$^2$ | 25m |
| E: Operator | 6x0.75mm$^2$ | 20m |
| F: Antenna | Coaxial cable 50Ω (RG-58/U) | 5m |

**Fig. 1** Elements of the complete installation

⚠ **The safe and correct operation of the installation is the responsibility of the installer.**

☞ For greater safety, Erreka recommends installing the photocells (4) and (10).

## 2 GENERAL CHARACTERISTICS OF THE OPERATOR

The VULCAN S operator is constructed to form part of a hinged gate automation system. Allows the requirements of standard EN 12453 to be fulfilled.

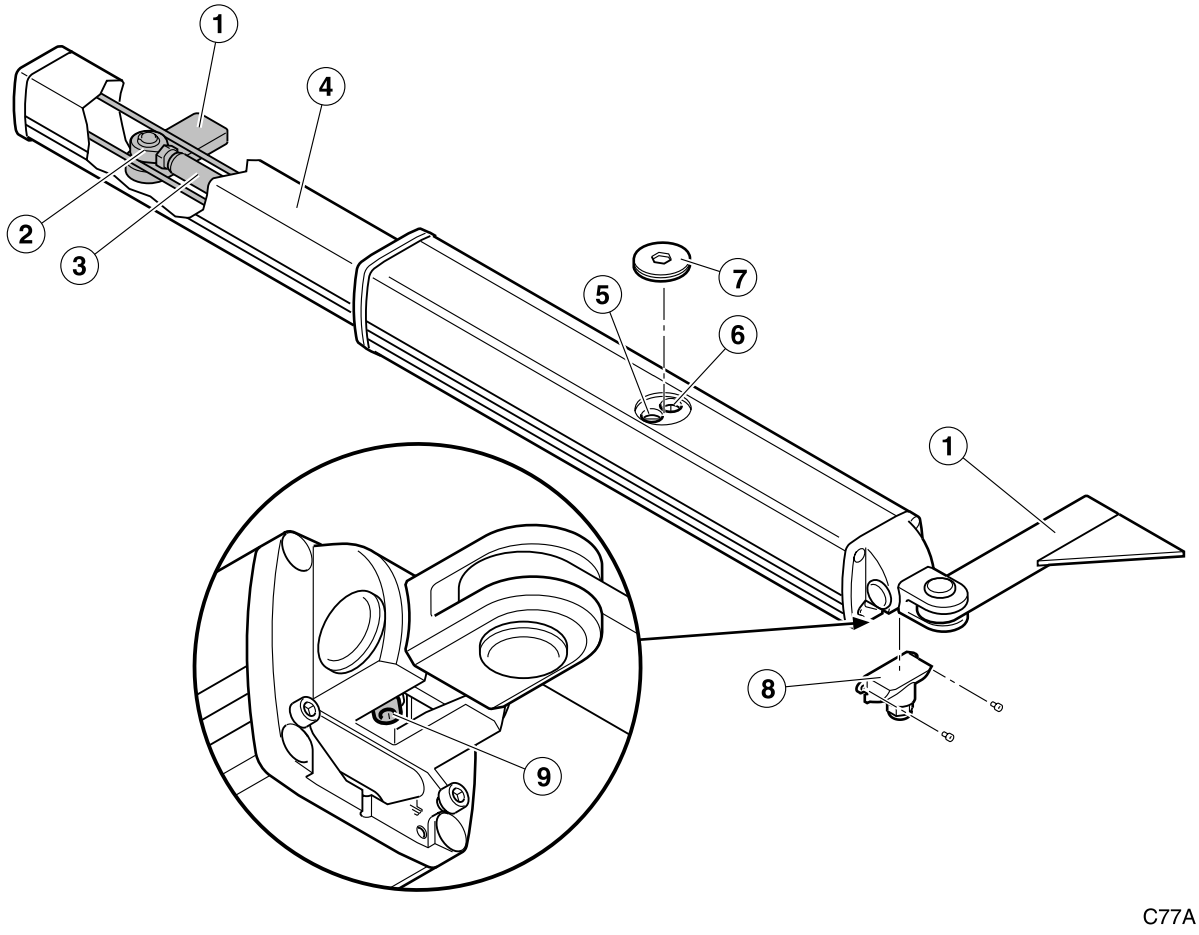
It comprises a metal casing, which contains a hydraulic pump and a drive piston.

VULCAN S operators are fitted with an exclusive safety system, patented by ERREKA.

This safety system is capable of detecting the collision of the gate with an obstacle, informing the control panel of this incident, in order to invert operation direction.

Hence, VULCAN S operators, along with the ERREKA control panels, allow the requirements of standard EN12453 to be met without the need for peripheral elements.

## 3 MAIN OPERATOR PARTS



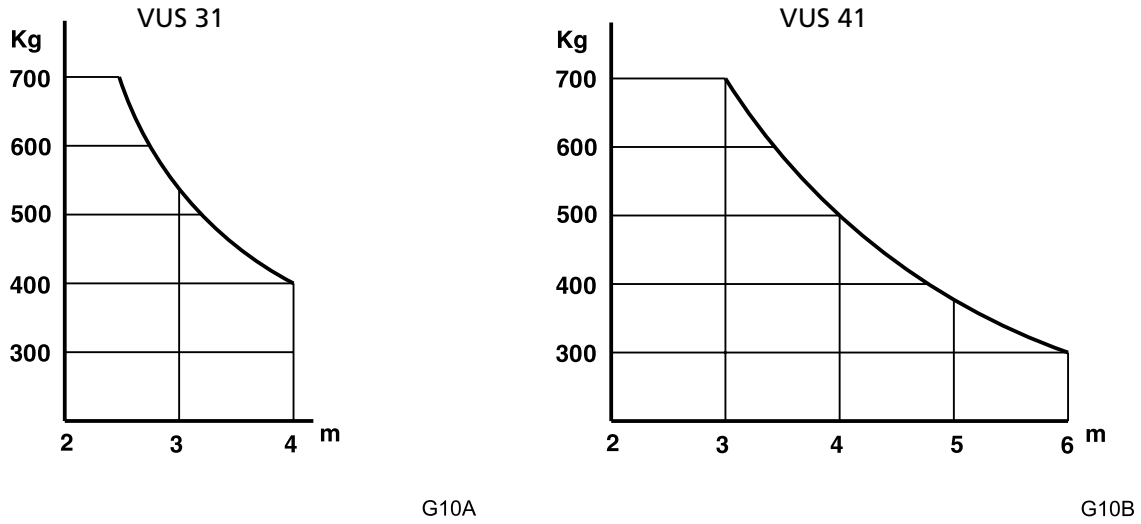

1 Supports
2 Ball and socket joint
3 Piston rod
4 Piston rod cover
5 Closing pressure adjustment screw
6 Opening pressure adjustment screw
7 Opening/closing pressure adjustment screw cap
8 Electrical connections cover
9 Discharge screw

**Fig. 2** VULCAN S operator main parts

## 4 GENERAL CHARACTERISTICS OF THE OPERATOR

| Model | General | Models -M |
|---|---|---|
| Power supply (V/Hz) | 230/50 | 110/60 |
| Intensity (A) | 1 | 2 |
| Power consumed (W) | 230 | 220 |
| Capacitor (µF) | 10 | 20 |
| Protection factor (IP) | 54 | |
| Maximum force (N) | 7.000 | |
| Piston rod speed (mm/s) | 10 (20 fast models -R-) | |
| Piston rod travel (mm) | VUS31: 265; VUS41: 400 | |
| Lock | None self locking | |
| Mechanical slow down | No | |
| Safety system | Obstacle detection patented by ERREKA | |
| Service temperature (ºC) | -10/+90 (-30/+90 models -F-) | |
| Duty cycles (%) | 100 | |
| Weight (Kg). | 9.5 (short models); 11 (long models) | |
| Use | Intensive | |

### Limits on use




☞Values for the purpose of orientation. The form of the leaf and the presence of wind may cause notable differences in the values of the chart. An electrolock must be used.

## 5 DECLARATION OF CONFORMITY

Erreka Automatismos declares that the electromechanical operator VULCAN S has been drawn up for use in a machine or for assembly along with other elements in order to form a machine in line with Directive 89/392 EEC and successive modifications.

The VULCAN S electromechanical operator allows us to carry out installations in line with the standards:
EN 13241-1 and EN 12453.

The VULCAN S electromechanical operator complies with safety legislation in line with the following directives and standards:

- 73/23 EEC and successive modification 93/68 EEC
- 89/366 EEC and successive modifications 92/31 EEC and 93/68 EEC
- UNE-EN 60335-1

## 1 UNPACKING

**1** Open the package and remove the contents from within.

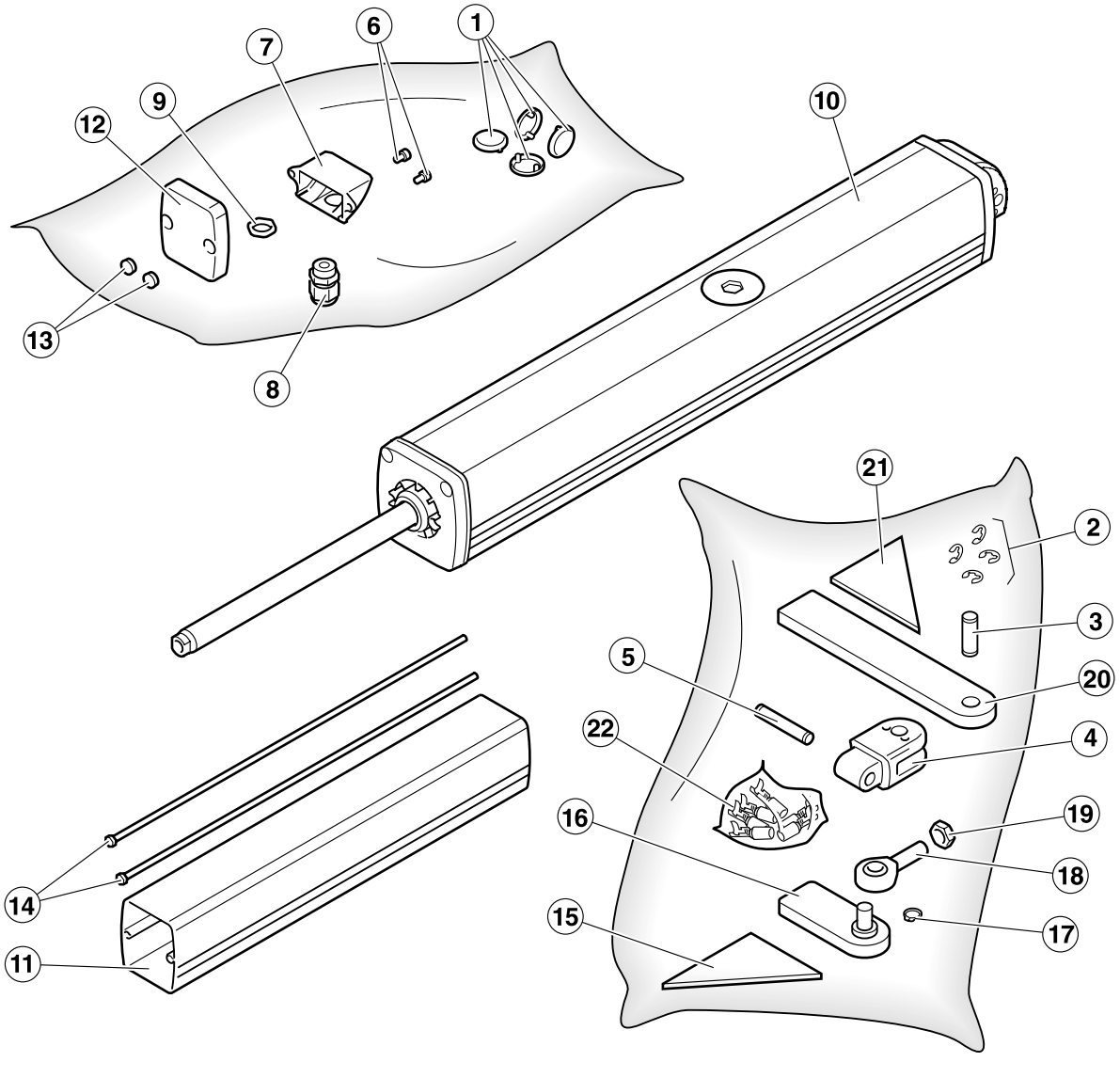
♻ Eliminate the packaging in an environmentally friendly manner, using recycling containers.

**⚠ Do not leave the packaging within the reach of children or handicapped people, as it may cause injury.**

**2** Check the content of the package (see figure below).

☞ Should it be noticed that a piece is missing or deteriorated, contact the closest technical service.

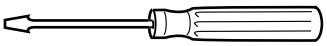
## 2 CONTENT



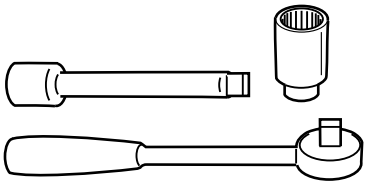

1 Gudgeon axles caps
2 Safety washers
3 Gudgeon vertical pin (ø = 12mm, L = 37mm)
4 Gudgeon
5 Gudgeon horizontal pin (ø = 10mm, L = 57.2mm)
6 Gland cover screws
7 Gland cover
8 Gland
9 Gland nut
10 Hydraulic motor body
11 Piston rod cover
12 Piston rod cover top
13 Piston rod cover tops
14 Piston rod cover rods
15 Front support bracket
16 Front support
17 Safety ring
18 Ball bearing joint
19 Ball bearing joint nut
20 Rear support
21 Rear support bracket
22 Faston terminals

**Fig. 3** VULCAN S Operator Content

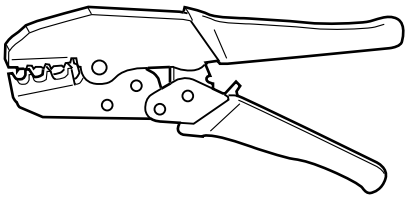
## 1 NECESSARY TOOLS

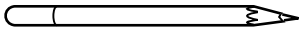

Set of screwdrivers

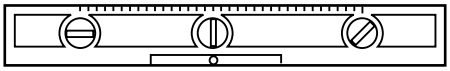

Fixed wrenches

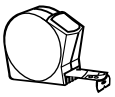

Socket wrench (8 mm)

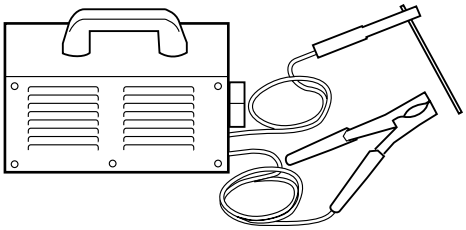

Set of Allen keys


Pincers for Faston terminals


Marker pencil


Level


Tape measure


Welding machine

⚠ **Use the welding machine in line with the use instructions.**

## 2 INITIAL CONDITIONS AND CHECKS

### Initial conditions of the gate

⚠ **Check that the size of the gate is within the admissible range of the operator (see the technical characteristics of the operator).**

⚠ **If the gate to be automated has a passage gate, install a safety device to prevent the operator from operating with the passage gate open.**

☞ The gate must have an in-ground central stop and an in-ground stop in opening.

☞ The gate must be easy to manipulate manually, namely:

- This must be balanced, in order to ensure the effort made by the motor is minimum.
- There should be no stiffness throughout its travel.

⚠ **Do not install the operator in a gate which does not work correctly in manual operation, as this may lead to accidents. Repair the gate before installing.**

### Environmental conditions

⚠ **This device is not suitable for installation in inflammable or explosive environments.**

⚠ **Check that the admissible environmental temperature range for the operator is suitable for the location.**

### Electrical power supply installation

⚠ **The electrical connections shall be made in line with the instructions in the control panel manual.**

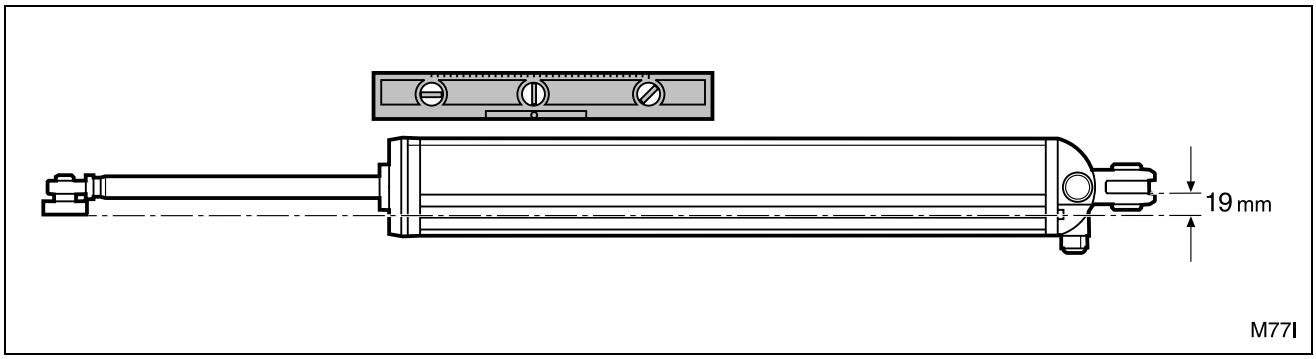
☞ The electrical cable section is indicated in: "Fig. 1 Elements of the complete installation" on page 39.

# 3 INSTALLING THE OPERATOR

## ☞ Horizontality of the operator

❗ The operator must work horizontally: to do this, the supports must be positioned with a height difference of 19 mm.

☞ Check horizontality using a Spirit level.




## ☞ Assembly positions and dimensions

☞ For the correct operation of the operator, it is essential that the supports are positioned respecting the dimensions calculated, with regards to the gate and its rotation axis.

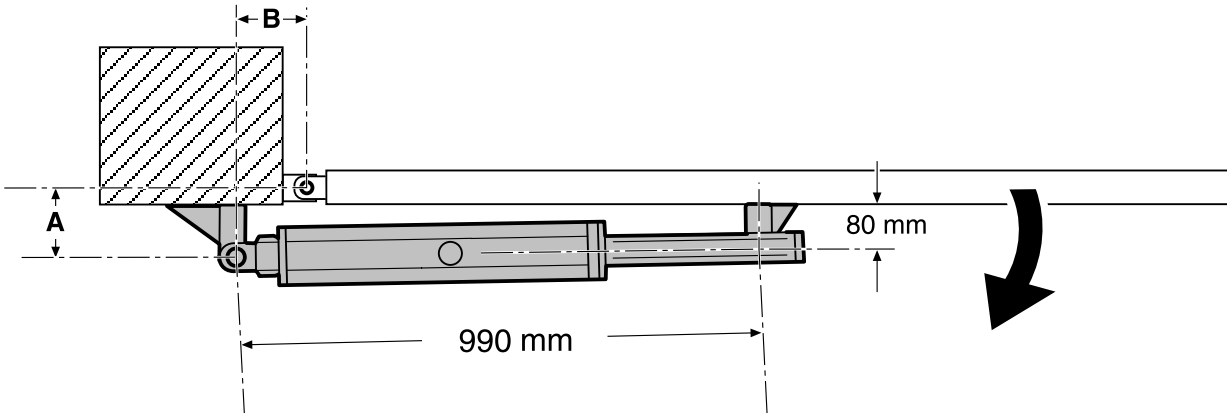
ℹ The dimensions are selected using either the table or the attached chart. The table indicates some specific cases, whilst the chart shows all the possible cases.

The assembly dimensions depend on the opening angle of the gate and the following factors:

- Type of operator chosen: short (Piston rod travel = 265mm) or long (Piston rod travel = 400mm)
- Opening of the gate inward or outward.

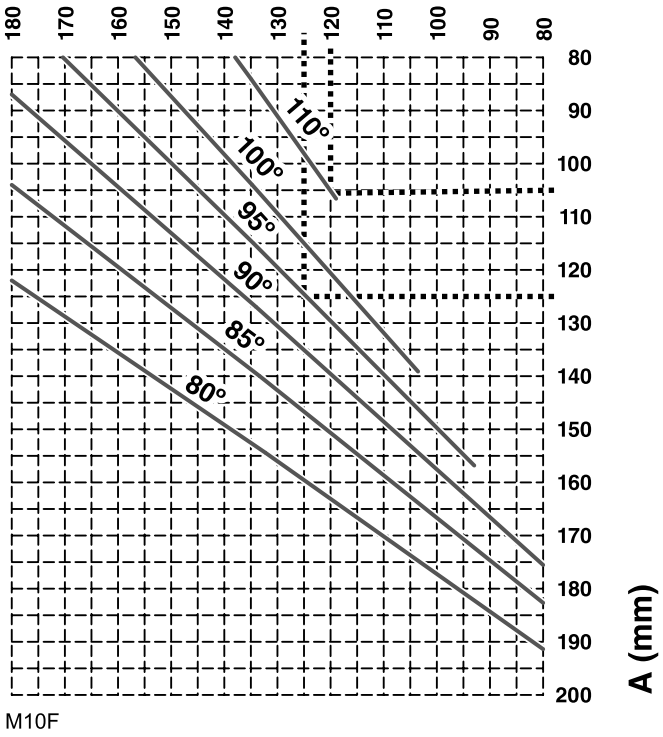
Hence there are four different cases, as explained below (each case is represented by way of its corresponding diagram, table and chart).

## Short operator, inward opening




M77C

**B (mm)**




M10F

| Opening angle | Dimension A | Dimension B |
|---|---|---|
| 80° | 155 | 130 |
| 85° | 140 | 130 |
| 90° | 140 | 120 |
| 90° | 115 | 145 |
| **95°** | **125** | **125** |
| 100° | 120 | 120 |
| **110°** | **105** | **120** |

Use of the chart:

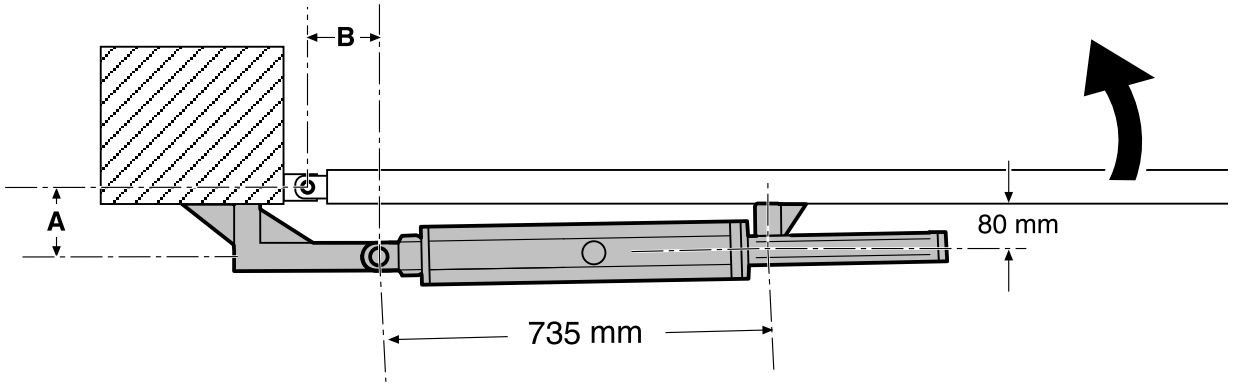
For a specific opening angle, multiple A-B pairs can be chosen. Generally, one of them will be determined by the characteristics of the installation (size of the pillar, presence of walls, etc).

**1** Select the specified dimension in the chart.

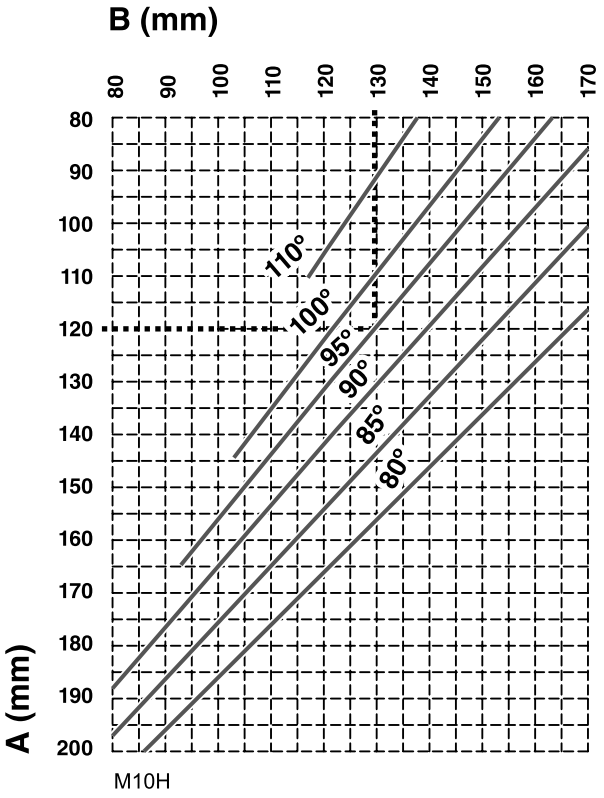
**2** Following the grid, move from the dimension to the line corresponding to the required opening angle.

**3** Following the grid, move to the other dimension.

## Short operator, outward opening




M77D




| Opening angle | Dimension A | Dimension B |
|---|---|---|
| 80° | 150 | 135 |
| 85° | 150 | 125 |
| 90° | 100 | 155 |
| 90° | 130 | 130 |
| **95°** | **120** | **130** |
| 100° | 100 | 135 |
| 110° | 95 | 125 |

ℹ Use of the chart:

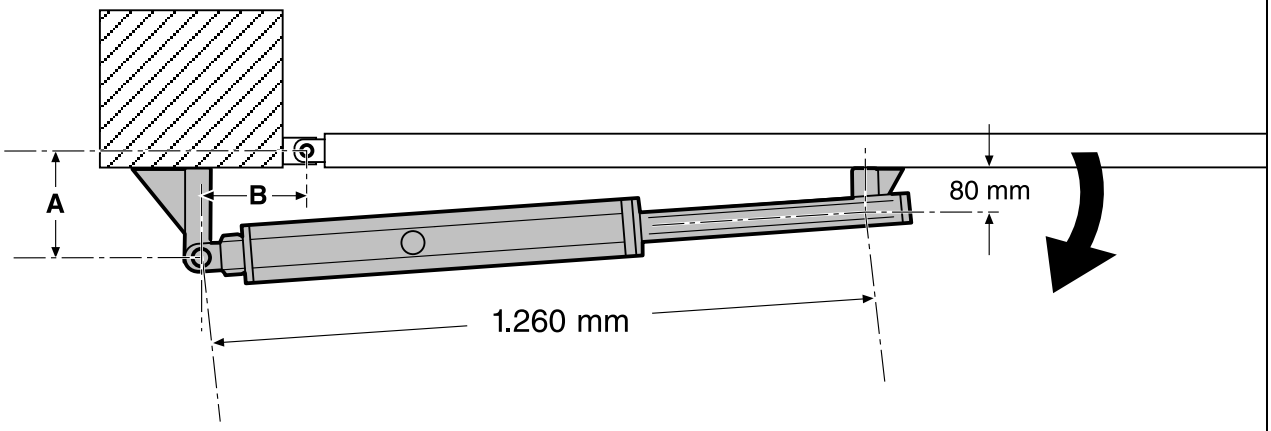
For a specific opening angle, multiple A-B pairs can be chosen. Generally, one of them will be determined by the characteristics of the installation (size of the pillar, presence of walls, etc).

**1** Select the specified dimension in the chart.

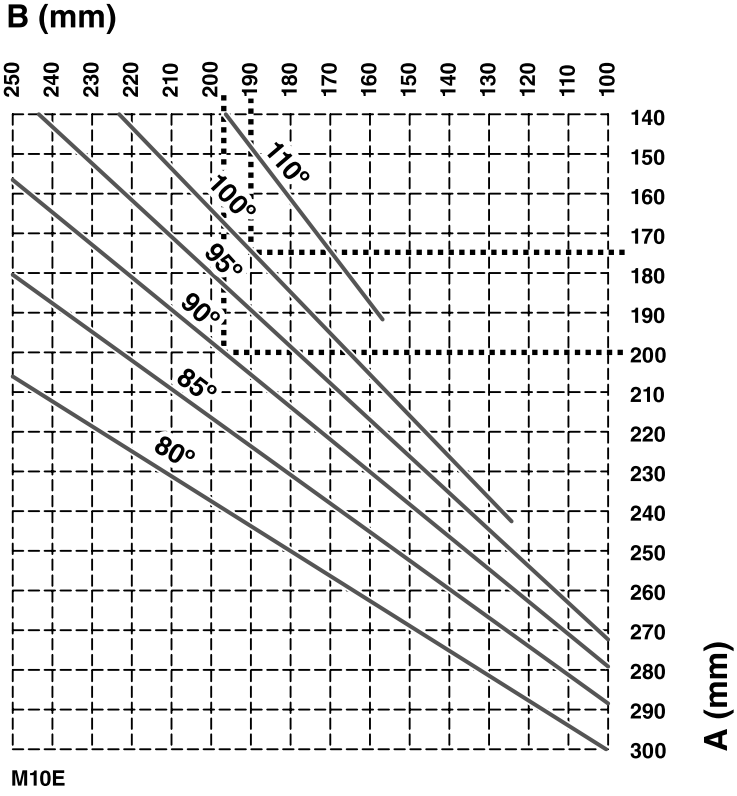
**2** Following the grid, move from the dimension to the line corresponding to the required opening angle.

**3** Following the grid, move to the other dimension.

## Long operator, inward opening




M77A




M10E

| Opening angle | Dimension A | Dimension B |
|---|---|---|
| 80° | 250 | 180 |
| 85° | 235 | 175 |
| **90°** | **200** | **195** |
| 90° | 235 | 150 |
| 95° | 220 | 155 |
| **100°** | **175** | **190** |
| 110° | 190 | 155 |

ℹ Use of the chart:

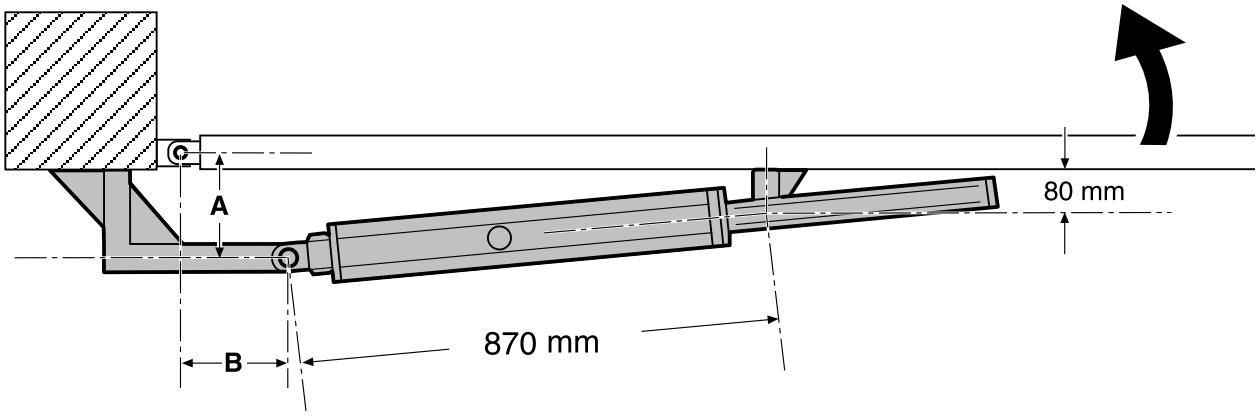
For a specific opening angle, multiple A-B pairs can be chosen. Generally, one of them will be determined by the characteristics of the installation (size of the pillar, presence of walls, etc).

**1** Select the specified dimension in the chart.

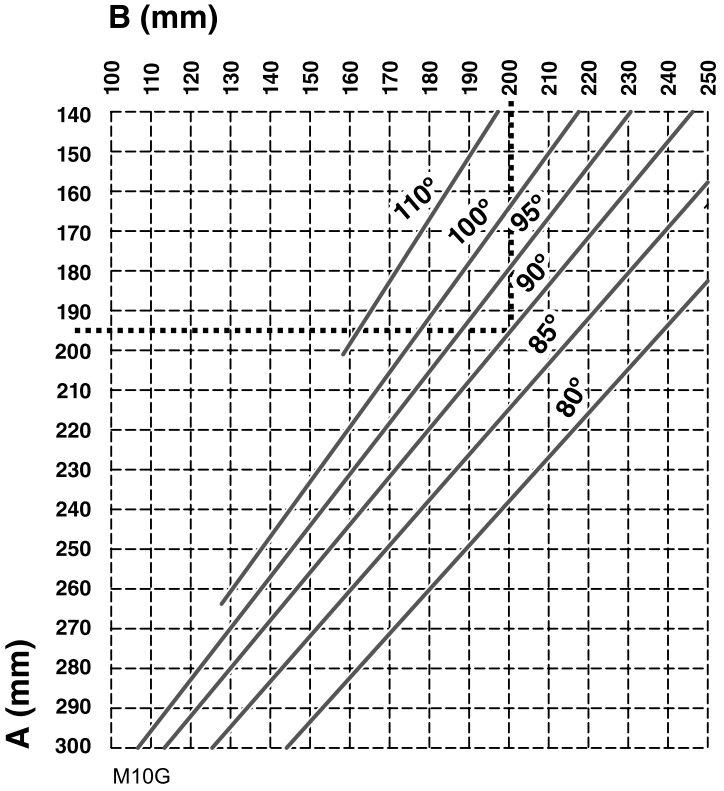
**2** Following the grid, move from the dimension to the line corresponding to the required opening angle.

**3** Following the grid, move to the other dimension.

## Long operator, outward opening




M77B




M10G

| Opening angle | Dimension A | Dimension B |
|---|---|---|
| 80° | 200 | 235 |
| 85° | 180 | 230 |
| 90° | 165 | 225 |
| **90°** | **195** | **200** |
| 95° | 160 | 215 |
| 100° | 140 | 215 |
| 110° | 140 | 195 |

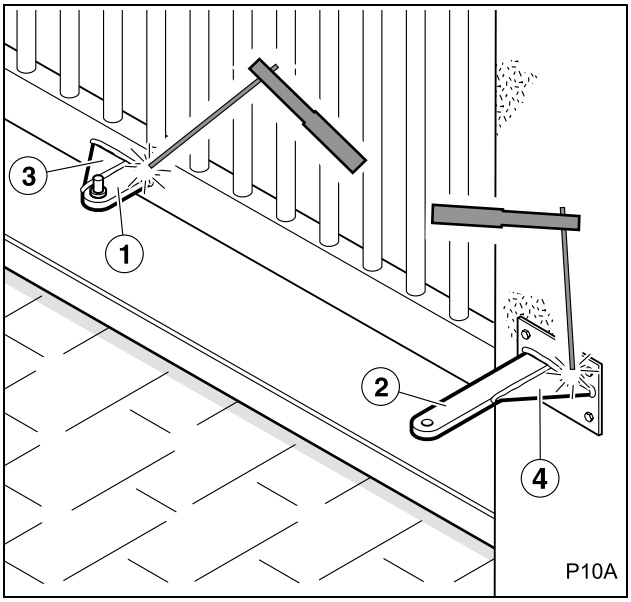
Use of the chart:

For a specific opening angle, multiple A-B pairs can be chosen. Generally, one of them will be determined by the characteristics of the installation (size of the pillar, presence of walls, etc).

1. Select the specified dimension in the chart.
2. Following the grid, move from the dimension to the line corresponding to the required opening angle.
3. Following the grid, move to the other dimension.

## Procedure

### Position the front and rear supports




**1** Attach the front (1) and rear (2) supports, keeping strictly to the dimensions shown in the previous section.

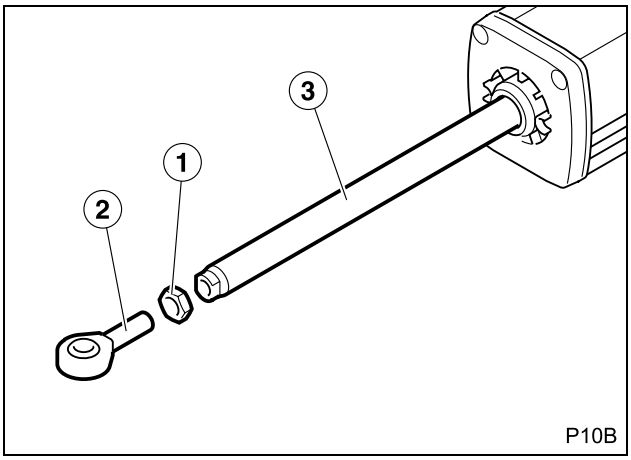
☞ The installer should choose the support attachment system (welding, screwing, molding, etc) in accordance with the composition of the material to which the supports are attached (metal, concrete, etc).

☞ Attach the supports on sufficiently robust structural elements.

**2** Weld the support brackets (3) and (4) to the supports (1) and (2).

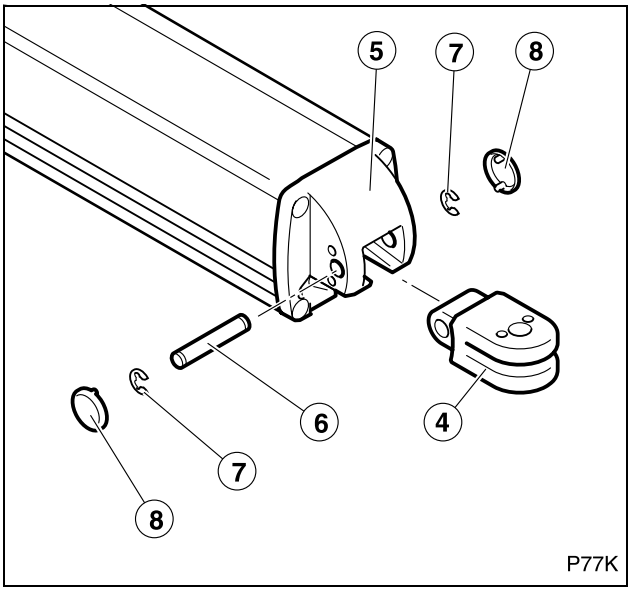
**Carry out the welding with the operator withdrawn and at a distance. If not, the piston rod may become damaged from Welding splatter, which could lead to failures and oil leaks.**

### Mount the ball bearing joint and the gudgeon




**1** Introduce the nut (1) in the ball bearing joint (2).

**2** Thread the ball bearing joint-nut set on the piston rod (3).




**3** Position the gudgeon (4) in its housing in the rear end cap (5).

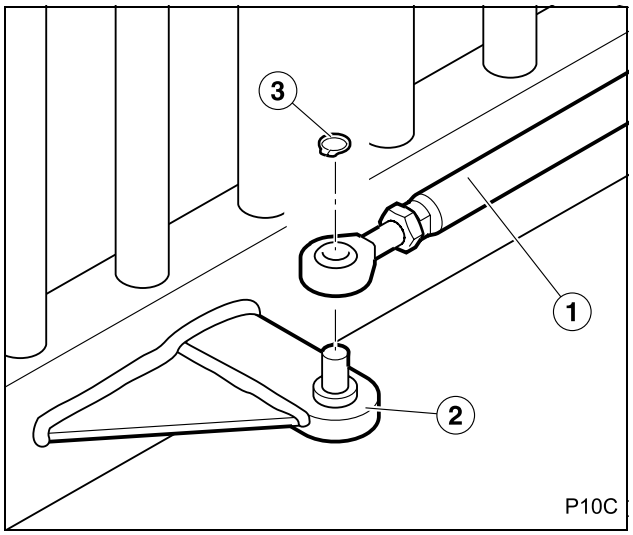
**4** Introduce the horizontal pin (6), crossing the gudgeon and the top.

☞ Horizontal pin: ø = 10mm, L = 57.2mm

**5** Secure the pin using the safety washers (7).

**6** Position the caps (8) to close the housing.

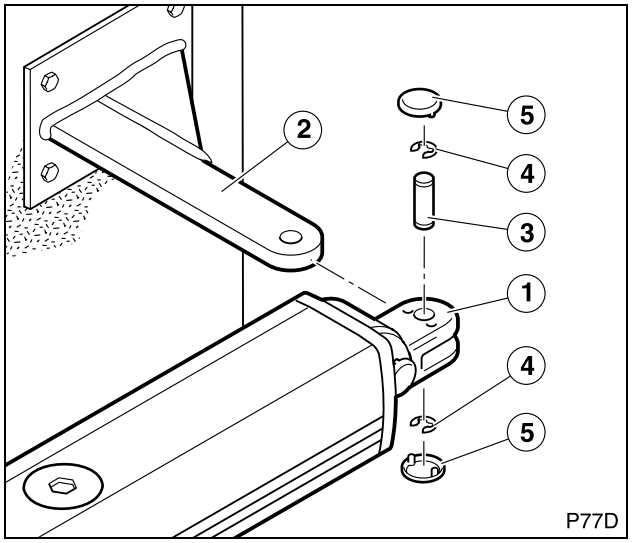
## Mount the operator on the front support




**1** Introduce the operator ball bearing joint (1) in the front support pin (2).

**2** Secure the ball bearing joint using the safety washer (3).

## Mount the operator on the rear support



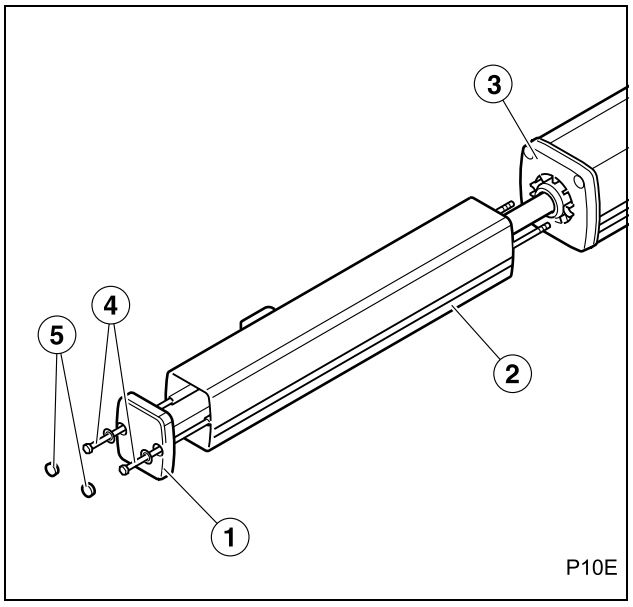

**1** Introduce the gudgeon (1) in the support (2).

**2** Position the vertical pin (3), crossing the orifices of the gudgeon and of the support.
☞ Vertical pin: ø = 12mm, L = 37mm

**3** Secure the pin using the safety washers (4).

**4** Position the caps (5) to close the housing.

## Mount the cover and the top

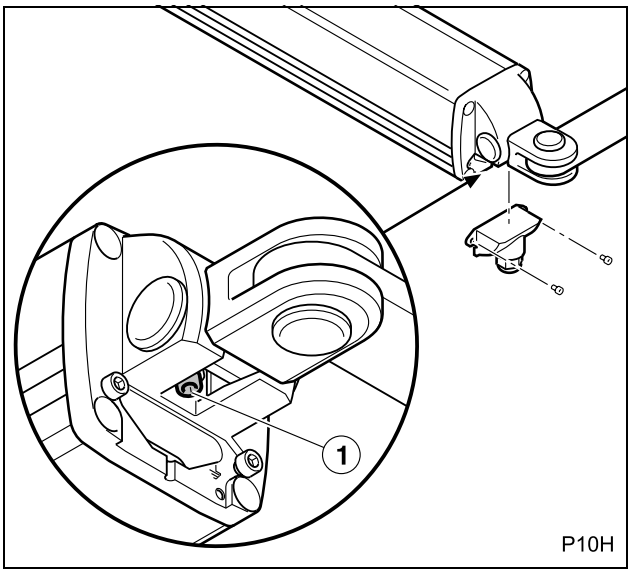



**1** Introduce the rods (4) through the orifices of the top (1) and the internal cover guides (2).

**2** Thread the rods in the front top of the operator (3) and tighten firmly.

**3** Position the caps (5) in the holes in the top

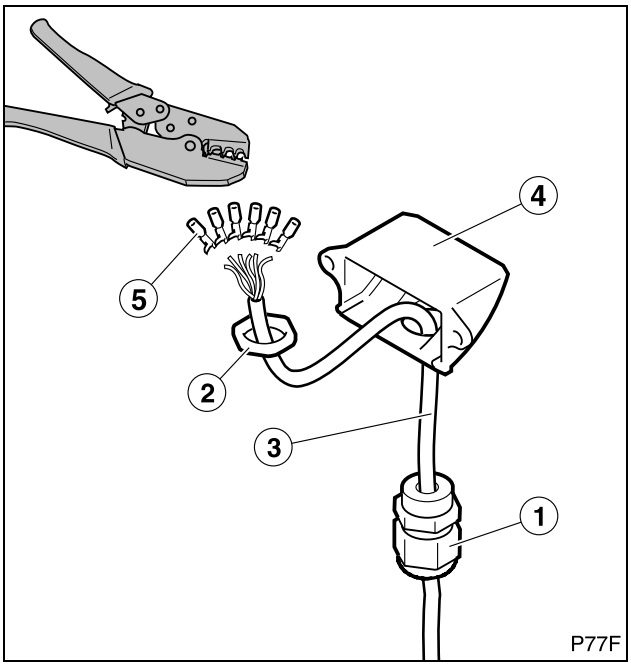
## Loosen the discharge screw




**1** Once the operator is mounted on the supports, turn the discharge screw (1) once to allow the correct operation of the hydraulic system.

**!** If you have to dismount the operator from its supports, first tighten the discharge screw in order to prevent the hydraulic fluid from leaking.

## Mount the gland and introduce the cable

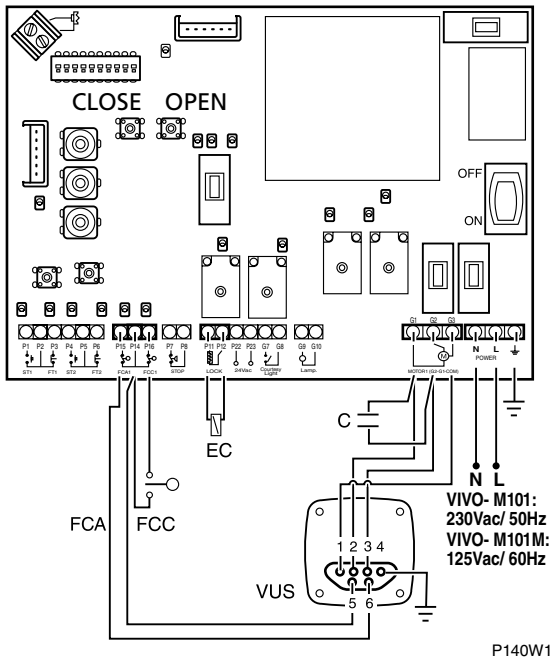



**1** Introduce the cable (3) through the gland PG11 (1).

**2** Position the gland in the end cap (4) and attach using the nut PG11 (2).

**3** Crimp the Faston connectors in the electrical cables (5).

## Connect the motor to the switchboard




1 Motor connection (common)
2 Motor connection (turning 1)
3 Motor connection (turning 2)
4 Earth
5 Safety device connection
6 Safety device connection

**⚠ Before making any electrical connections, check the switchboard instructions manual.**

☞ We recommend using switchboard VIVO-D101(M).

**1** Connect the operator (VUS) to the switchboard.

**2** Connect the capacitor (C) in cable connectors Turn 1 and Turn 2.

**3** Connect the closing limit switch (FCC).
☞ The FCC allows the switchboard to distinguish between a collision with an obstacle and with a stopper on closing.

**4** Connect the switchboard to the electricity supply.

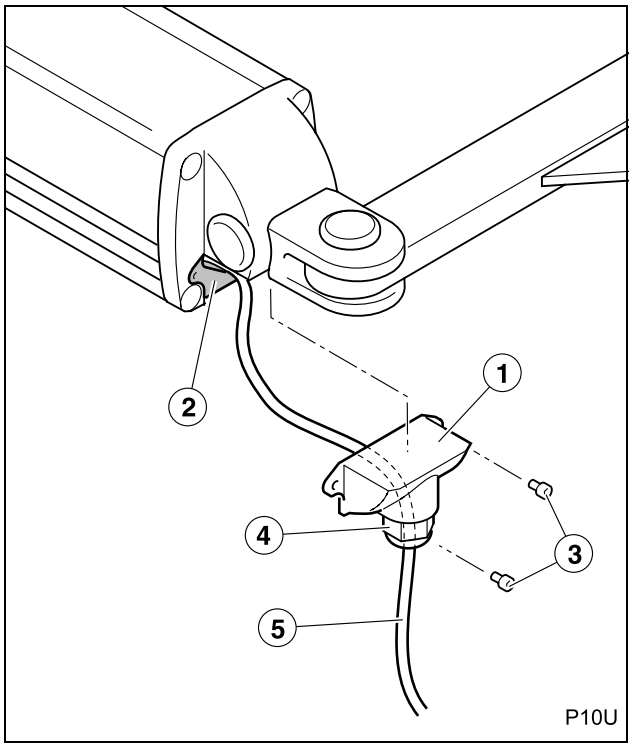
**5** Activate the power supply switch.

**⚠ Before carrying out any gate movement, ensure there is no person or object in the radius of action of the gate and the drive mechanisms.**

**6** Use the switchboard mini-pushbuttons (CLOSE-OPEN) to check the motor connections are correct (turning direction).
☞ If the turning direction is not correct, interchange the cables 2 and 3.

**⚠ Ensure the earth cable is properly connected.**

## Position the end cap and tighten the gland



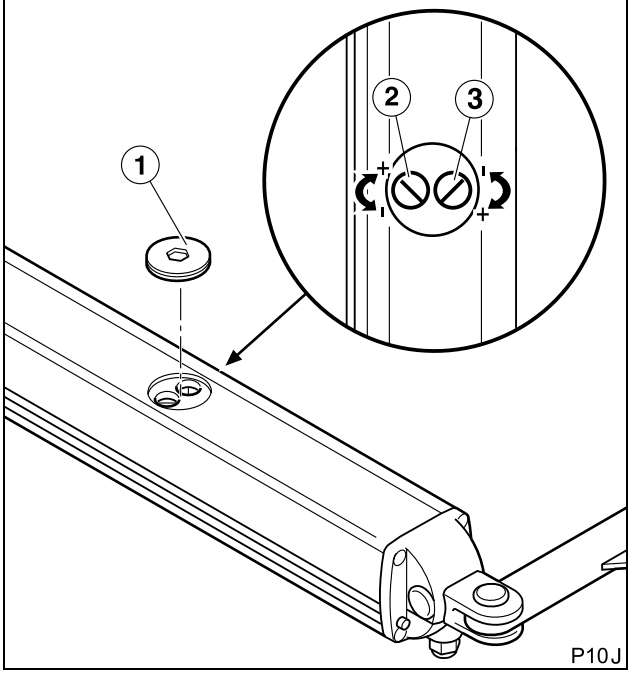

**1** Position the end cap (1) in its housing (2) and attach using the screws (3).

**2** Tighten the gland (4) to ensure the electrical cable input (5) is seal tight.

## Adjust the opening and closing force

☞ For both screws, clockwork rotation increases the force. Anti-clockwork rotation reduces the force.

❗ Do not tighten the regulation screws (2) to (3) to the maximum, as this may cause damage.




⚠ **The opening and closing forces must be adjusted to fulfil standard EN 12453:2000 (for further details, please ask "Final preparation" on page 53).**

**1** Remove the cap (1) which covers the adjustment screws.

**2** CLOSING FORCE: screw (2).

☞ The "Closing force" is, more exactly, the force during the extension of the piston rod. In inward opening installations, it corresponds to the closing operation.
In outward opening installations, it corresponds to the opening operation.

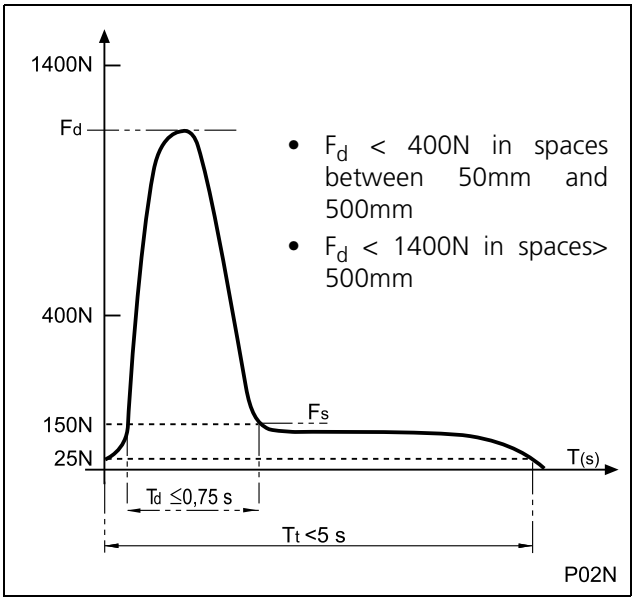
**3** OPENING FORCE: screw (3).

☞ The "Opening force" is, more exactly, the force during the retraction of the piston rod. In inward opening installations, it corresponds to the opening operation.
In outward opening installations, it corresponds to the closing operation.

**4** Replace the cap (1).

# 4 FINAL PREPARATION

## Connections and checks




- $F_d$ < 400N in spaces between 50mm and 500mm
- $F_d$ < 1400N in spaces> 500mm

**1** Carry out the installation and the connections for all the elements of the facility, in line with the control panel instructions.

**2** Check that the mechanism is correctly regulated.

⚠ **The opening and closing forces must be adjusted to respect the values indicated in standard EN 12453:2000, as shown in the attached chart. The measurements must be made in line with the method described in standard EN 12445:2000.**

**3** Check the operation of all the installation elements, especially the protection systems and the manual operation unlocking system.

## User instruction

**1** Instruct the user with regards to the use and maintenance of the facility and provide him/her with the use manual.

**2** Point to the gate, showing that it opens automatically, and indicating how to operate it manually. Where appropriate, indicate that operation is using the remote control.

## 1 MAINTENANCE

⚠ **Before carrying out any maintenance operation, disconnect the device from the power supply.**

❗ If you have to dismount the operator from its supports, first tighten the discharge screw in order to prevent the hydraulic fluid from leaking.

**1** Regularly check installation in order to discover any imbalance or signs of deterioration or wear. Do not use the device if any repair or adjustment is necessary.

**2** Clean and lubricate the articulations of the gate, so as not to increase the effort of the operator.

**3** Check that the transmitters and photocells, as well as their installation, have not suffered any damage from the weather or external agents.

## 2 FAILURE DIAGNOSIS

| Problem | Cause | Solution |
|---|---|---|
| The operator does not make any movement when the opening or closing transmitters are activated | Absence of system power voltage | Re-establish the power supply voltage |
| | Defective electrical installation | Check that the installation does not present any short-circuits or cut-off points |
| | Defective control panel or control devices | Check these elements, seeing their respective manuals |
| | Defective capacitor | Check the state of the capacitor |
| By activating the opening or closing controls, the operator is enabled but the gate does not move | The assembly dimensions of the supports have not been respected. | Dismount the supports and then put them back in place, respecting the assembly dimensions |
| The gate moves in an irregular manner | The operator is not horizontal | Dismount the supports and then put them back in place, respecting the height difference of 19 mm |
| The gate cannot completely close (or open) | The photocell detects an obstacle | Eliminate the obstacle and try again |
| | The resistance of the gate has increased when closing (or when opening) | Check the moving parts of the gate and eliminate the resistance |
| | The force of the operator during closing (or opening) is too low | Use the opening and closing force adjustment screws to increase the force when opening and closing |
| | The assembly dimensions of the supports have not been respected. | Dismount the supports and then put them back in place, respecting the assembly dimensions |

## 3 SPARE PARTS

⚠ **If the operator needs repairing, go to an authorised assistance centre or manufacturer; never try to repair it yourself.**

⚠ **Use only original spare parts.**

## 4 SCRAP

⚠ **The operator, up until the end of its useful life, must be dismounted at its location by an installer who is as well qualified as the person who completed the assembly, observing the same precautions and safety measures. In this manner we will avoid possible accidents and damage to adjacent facilities.**

♻ The operator must be deposited in the appropriate containers for subsequent recycling, separating and classifying the different materials in line with their nature. NEVER deposit it in domestic rubbish or in landfills which are not controlled, as this will cause environmental damage.