

ICARO

D811310 30-06-02 Vers. 03

**AUTOMATION
FOR RACK
SLIDING GATES**



Thank you for buying this product, our company is sure that you will be more than satisfied with the product's performance. The product is supplied with a "Warnings" leaflet and an "Instruction booklet". These should both be read carefully as they provide important information about safety, installation, operation and maintenance. This product complies with the recognised technical standards and safety regulations. We declare that this product is in conformity with the following European Directives: 89/336/EEC and 73/23/EEC (and subsequent amendments).

1) GENERAL OUTLINE

The ICARO actuator offers ample installation versatility, thanks to the extremely low position of the pinion, the compactness of the actuator and to the height and depth which can be very easily adjusted. It is equipped with an antisquash electronic device, which ensures utmost safety. The emergency manual release can be activated very easily by means of a knob featuring a personalised key.

The gate stop is controlled by electromechanical end-of-stroke microswitches or, for very cold areas, by proximity sensors.

The control board can be built-in or installed onto a separate cabinet.

The gearmotor (fig. 1) is made up of the following:

- M** Motor
- R** Worm screw - worm wheel reduction gear
- S** Electromechanical end-of-stroke unit or proximity sensor
- P** Pinion with release
- C** Control board with capacitor
- E** Obstacle detection device (Encoder)

2) GENERAL SAFETY

WARNING! An incorrect installation or improper use of the product can cause damage to persons, animals or things.

- The "Warnings" leaflet and "Instruction booklet" supplied with this product should be read carefully as they provide important information about safety, installation, use and maintenance.
- Scrap packing materials (plastic, cardboard, polystyrene etc) according to the provisions set out by current standards. Keep nylon or polystyrene bags out of children's reach.
- Keep the instructions together with the technical brochure for future reference.
- This product was exclusively designed and manufactured for the use specified in the present documentation. Any other use not specified in this documentation could damage the product and be dangerous.
- The Company declines all responsibility for any consequences resulting from improper use of the product, or use which is different from that expected and specified in the present documentation.
- Do not install the product in explosive atmosphere.
- The construction components of this product must comply with the following European Directives: 89/336/CEE, 73/23/EEC, 98/37/EEC and subsequent amendments. As for all non-EEC countries, the above-mentioned standards as well as the current national standards should be respected in order to achieve a good safety level.
- The Company declines all responsibility for any consequences resulting from failure to observe Good Technical Practice when constructing closing structures (door, gates etc.), as well as from any deformation which might occur during use.
- The installation must comply with the provisions set out by the following European Directives: 89/336/CEE, 73/23/EEC, 98/37/EEC and subsequent amendments.
- Disconnect the electrical power supply before carrying out any work on the installation.
- Fit an omnipolar or magnetothermal switch on the mains power supply, having a contact opening distance equal to or greater than 3mm.
- Check that a differential switch with a 0.03A threshold is fitted just before the power supply mains.
- Check that earthing is carried out correctly: connect all metal parts for closure (doors, gates etc.) and all system components provided with an earth terminal.
- Fit all the safety devices (photocells, electric edges etc.) which are needed to protect the area from any danger caused by squashing, conveying and shearing.
- Position at least one luminous signal indication device (blinker) where it can be easily seen, and fix a Warning sign to the structure.
- The Company declines all responsibility with respect to the automation safety and correct operation when other manufacturers' components are used.
- Only use original parts for any maintenance or repair operation.
- Do not modify the automation components, unless explicitly authorised by the company.

- Instruct the product user about the control systems provided and the manual opening operation in case of emergency.
- Do not allow persons or children to remain in the automation operation area.
- Keep radio control or other control devices out of children's reach, in order to avoid unintentional automation activation.
- The user must avoid any attempt to carry out work or repair on the automation system, and always request the assistance of qualified personnel.
- Anything which is not expressly provided for in the present instructions, is not allowed.

3) TECHNICAL SPECIFICATIONS

- Power supply: 230V ~ ±10% single-phase 50Hz (*)
 - Motor revolutions: 1400 min⁻¹
 - Absorbed power: 750 W
 - Capacitor: 25 µF (230V) :100 µF (110V)
 - Thermal protection: 140 °C
 - Insulation class: F
 - Reduction gear ratio: 1/38
 - Output revolutions: 37 min⁻¹
 - Pinion pitch: 4 mm 18 or 25 teeth
 - Leaf speed: 9m/min (18 teeth).....12m/min (25 teeth)
 - Max. capacity: with pinion Z18 20.000 N(≈2000 kg)
with pinion Z25 10.000 N(≈1000 kg)
 - Max. torque: 40 Nm
 - Impact reaction: Obstacle detection device (Encoder)
 - Lubrication: ERGOIL
 - Manual manoeuvre: Mechanical knob release
 - No. manoeuvres in 24 hours: continuous service
 - Control unit: LEO
 - Weather conditions: from -15 °C to +60 °C
 - Protection degree: IP 24
 - Dimensions: See fig.2
 - Actuator weight: 25 kg
- (*) Special voltages on request

4) PRELIMINARY CHECKS

Before proceeding to any installation work, check that the gate structure conforms to whatever is prescribed by the current standards, and in particular that:

- The gate sliding track is linear and horizontal, and the wheels are suitable for supporting the gate weight.
- The gate manual operation can be carried out smoothly along its entire run, and there is no excessive side slipping.
- A correct play is provided between the upper guide and the gate to ensure regular noiseless movement.
- The opening and closing gate stops are positioned.
- The established position for gearmotor fixing allows the emergency manoeuvre to be carried out smoothly and safely. In the case where the elements checked do not meet the above requirements, proceed to carrying out the necessary corrective actions or replacements.

WARNING: Remember that control devices are intended to facilitate gate operation, but can not solve problems due to any defects or deficiency resulting from failure to carry out correct installation or maintenance.

Take the product out of its packing and inspect it for damage. Should it be damaged, contact your dealer. Remember to dispose of its components (cardboard, polystyrene, nylon, etc.) according to the current prescriptions.

5) BASE PLATE ANCHORING

5.1) Standard position

- Dig a hole where the cement pad with the buried base plate log bolts is to be placed in order to fix the reduction gear unit (fig.3). If the sliding track is already there, digging must be partly carried out in the track foundation casting. This way, should the track foundation casting sag, the gearmotor base would also lower, thus maintaining the play between pinion and rack (approximately 1-2 mm).
- Position the base plate according to the dimensions specified in fig.4.
- The pinion symbol printed on the base plate must be visible and directed towards the gate. This also ensures the correct positioning of the raceways for electrical connections.
- Let the flexible pipes containing electrical cables protrude from the base plate.
- In order to keep the base plate in its correct position during installation, it may be useful to weld two iron flat bars under the track, and then weld

12) TERMINAL BOARD CONNECTIONS

First pass the appropriate electric cables through the raceways and fix the various automation components to the chosen points, then connect them following the directions and diagrams contained in the control unit instruction manual.

Carry out phase, neutral and (compulsory) earth connections. The protection wire (earth) with yellow/green insulating sheath must be connected to the appropriate terminals marked by their symbol.

Operate the automation only after having connected and checked all the safety devices.

The mains power supply cables must be stripped as little as possible; the power supply cable earth wire must be stripped for a greater length, in order to reach the terminal purposely arranged in the box (fig. 16 ref. "A").

The P1 cable-clamp is reserved for the mains power supply cables, the P2 cable-clamp is reserved for the accessory cables and safety devices.

The cables must be tied by additional fastening next to the terminals, by means of clips for example.

All the operator wiring operations must be carried out by qualified personnel.

A description of the terminals in the control board mod. LEO mounted on the actuator (fig. 14) is provided here below:

JP1

- 1 \perp GND terminal
- 2-3 Single-phase mains supply 230V $\sim \pm 10\%$ 50Hz (2=N) (3=L)

JP2

- 4-5 Blinker connection (mains voltage) 40W Max.
- 6-7-8-9 Motor connection:
 - 6 operation 1 (brown) + capacitor
 - 7 common (blue)
 - 8 operation 2 (black)
 - 9 capacitor

JP3

- 10-11 Output 24V \sim 180mA max – power supply for photocells or other devices.
- 12-13 Gate-open warning light output (24V 3W max)

JP5

Encoder connection
WARNING! The maximum length of the connection cable of the encoder should not exceed 3.00 m.

JP6

- 21-22 Open-Close button (N.O. Start), key selector.
- 21-23 Block button (N.C. Stop). If not used, leave jumped.
- 21-24 Photocell input (N.C.). If not used, leave jumped.
- 21-25 Opening limit switch connection (N.C. SWO). If not used, leave jumped.
- 21-26 Closing limit switch connection (N.C. SWC). If not used, leave jumped.
- 21-27 Pedestrian button connection (N.O. Ped)
- 21-28 Open-Button connection (N.O. Open)
- 21-29 Close-Button connection (N.O. Close)
- 21-30 Rubber edge connection (N.C.). If not used, leave jumped.
- 21-31 Timer input connection (N.O.). If the contact is open the leaves close and the gate is ready for normal operation. If the contact is closed (N.C.), the leaves open and remain open until the contact is opened. If not used, leave jumped.

JP9

- 34 TX1 serial output
- 35 TX2 serial output
- 36 RX1 serial input
- 37 RX2 serial input
- 38-39 Antenna input for snap-in radio receiver board (38 signal - 39 braid). Cable RG58
- 40-41 Second radio channel output of twin-channel receiver board

WARNING - If the opening direction is not correct, invert the motor connections no. 6 and 8 and connections no. 25 and 26 of the opening and closing limit switches.

13) MOTOR TORQUE SETTING



WARNING: Check that the impact force value measured at the points established by the EN 12445 standard is lower than that specified in the EN 12453 standard.

The setting of the motor torque is electronically controlled by an encoder. Refer to the LEO control board instructions for a correct setting of the electronic antisquash safety device.



WARNING! The ICARO actuator does not offer the possibility of adjusting the safety clutch. It is therefore necessary to use a control board prearranged for the electronic control of the motor torque.

14) MANUAL RELEASE

The manual or emergency release should only be activated when the gate has to be opened manually or whenever the automation is not correctly or totally functioning.

To carry out the emergency manoeuvre, proceed as follows:

- Insert the personalised key into the lock and turn it anticlockwise by 90°.
- Turn the release knob clockwise (fig. 17) as far as it will go. The pinion will therefore become idle and the gate can then be opened manually.
- Push the leaf of the gate all the way down to the end-of-stroke.

Warning: do not push the gate leaf roughly, but move it gently all along its stroke.

The key can be removed from the lock only after the knob has been moved back to its initial position (motor-driven operation)

- To re-activate motor-driven control, turn the knob anticlockwise as far as it will go. Move the key back to its closing position, remove it and then store it in a safe place, which is known to anyone who may need the knob.

15) INSTALLATION CHECK

Before the automation device finally becomes operational, scrupulously check the following conditions:

- Check that all the safety devices (limit microswitches, photocells, electric edges etc) operate correctly.
- Check that the rack and pinion are correctly meshed (minimum play 2mm).
- Check that the pushing force of the gate is within the limits provided for by the current standards.
- Check that the opening and closing end-of-stroke runners are correctly positioned and tightly secured.
- Check the starting and stopping operations using the manual control.
- Check the starting and stopping operations using the remote radio control.
- Check the normal or customised operation logic.

16) AUTOMATION DEVICE USE

Since the automation device can be controlled both remotely and in sight, by means of a radio control device or a button, all the safety devices must be frequently checked in order to ensure their perfect efficiency.

WARNING! In the event of any safety device malfunction, request immediate assistance from qualified personnel. Children must be kept at a safe distance from the automation operation area.

17) AUTOMATION CONTROL

The use of this control device allows the gate to be opened and closed automatically. There are different types of controls (manual, radio control, magnetic card access etc.) depending on the installation requirements and characteristics. For the various control systems, see the relevant instructions.

The installer undertakes to instruct the user about correct automation operation, also pointing out the actions to be taken in case of emergency.

18) MAINTENANCE

WARNING! Before proceeding to any maintenance, disconnect the mains power supply and, if the battery is fitted, one of its poles.

These are the check and maintenance operations to be carried out:

- Check the condition of lubrication of the metal racks once a year.
- Keep the sliding track always clean and free from debris.
- Occasionally clean the photocell optical elements.
- Have a qualified technician (installer) check the correct torque limit setting.
- When any operational malfunction is found, and not resolved, disconnect the mains power supply and request the assistance of a qualified technician (installer). When the automation controller is out of service, you can activate the manual release device (see paragraph on "Emergency manoeuvre") in order to set the pinion idling and therefore allow the gate to be opened and closed by hand.

19) NOISE

The environmental noise produced by the gear-motor in normal operation conditions is constant and does not exceed 70 dB (A).

20) SCRAPPING

Materials must be disposed of in conformity with the current regulations.

In case of scrapping, the automation devices do not entail any particular risks or danger. In case of materials to be recycled, these should be sorted out by type (electrical components, batteries, copper, aluminium, plastic etc.).

21) DISMANTLING

When the automation system is disassembled to be reassembled on another site, proceed as follows:

- Disconnect the power supply and the entire electrical installation.
- Remove the gearmotor from its fixing base.
- Disassemble the control panel, if separate, and all installation components.
- In the case where some of the components cannot be removed or are damaged, they must be replaced.

22) MALFUNCTIONS AND REMEDIES

22.1) Faulty actuator operation

- Use an appropriate instrument to check that the actuator ends are supplied with voltage after the opening or closing command.
- If the leaf movement is opposite to that required, reverse the motor drive connections in the control unit.

22.2) Faulty operation of electrical accessories

In case of fault, all the control and safety devices can cause the automation controller to malfunction or lock. If the control unit is provided with self-diagnosing facility, identify the fault. If a fault is found, it is advisable to disconnect and, if necessary, bridge, all the automation control devices one by one, until the one causing the fault is identified. Replace or repair it, then reset all the devices which were previously disconnected or bridged. For all the devices installed, make reference to the respective instruction manual.

WARNING! Correct controller operation is only ensured when the data contained in the present manual are observed. The company is not to be held responsible for any damage resulting from failure to observe the standards relating to safety, installation and good technical practice, as well as the instructions contained in the present manual.

The descriptions and illustrations contained in the present manual are not binding. The Company reserves the right to make any alterations deemed appropriate for the technical, manufacturing and commercial improvement of the product, while leaving the essential product features unchanged, at any time and without undertaking to update the present publication.

Fig. 1

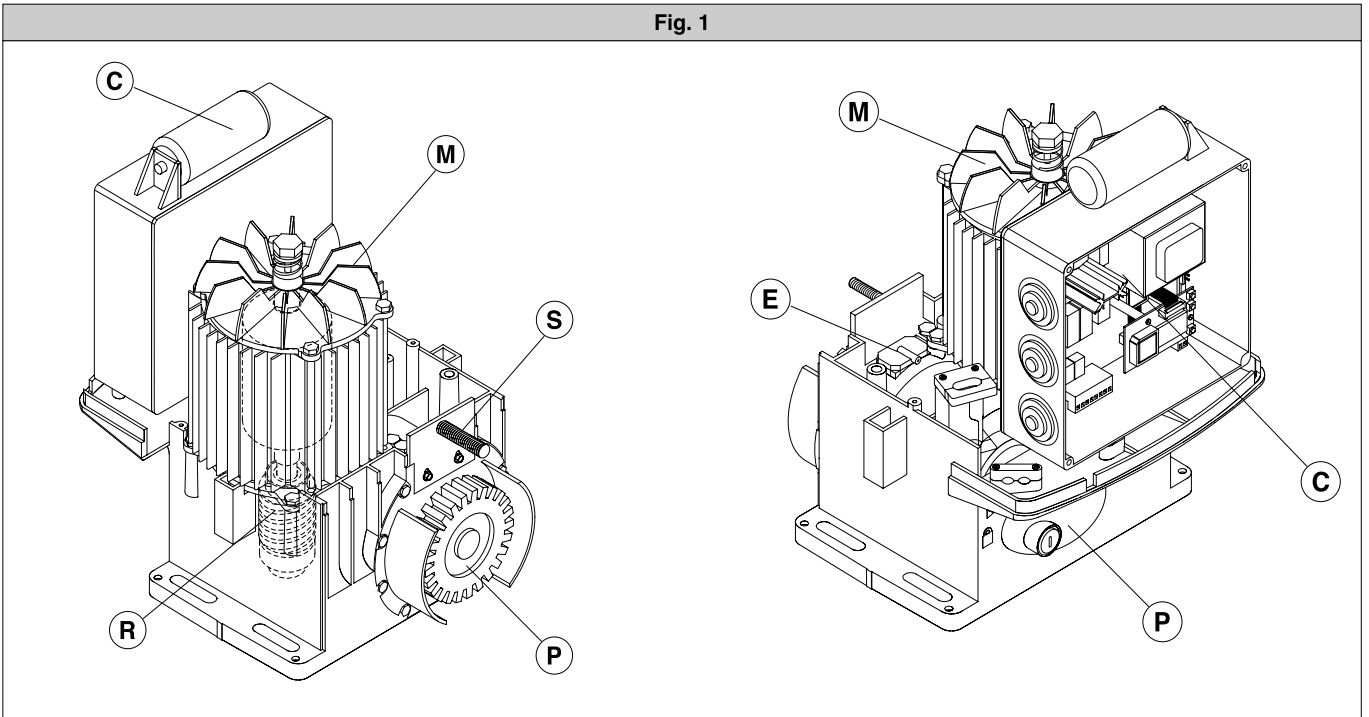


Fig. 2

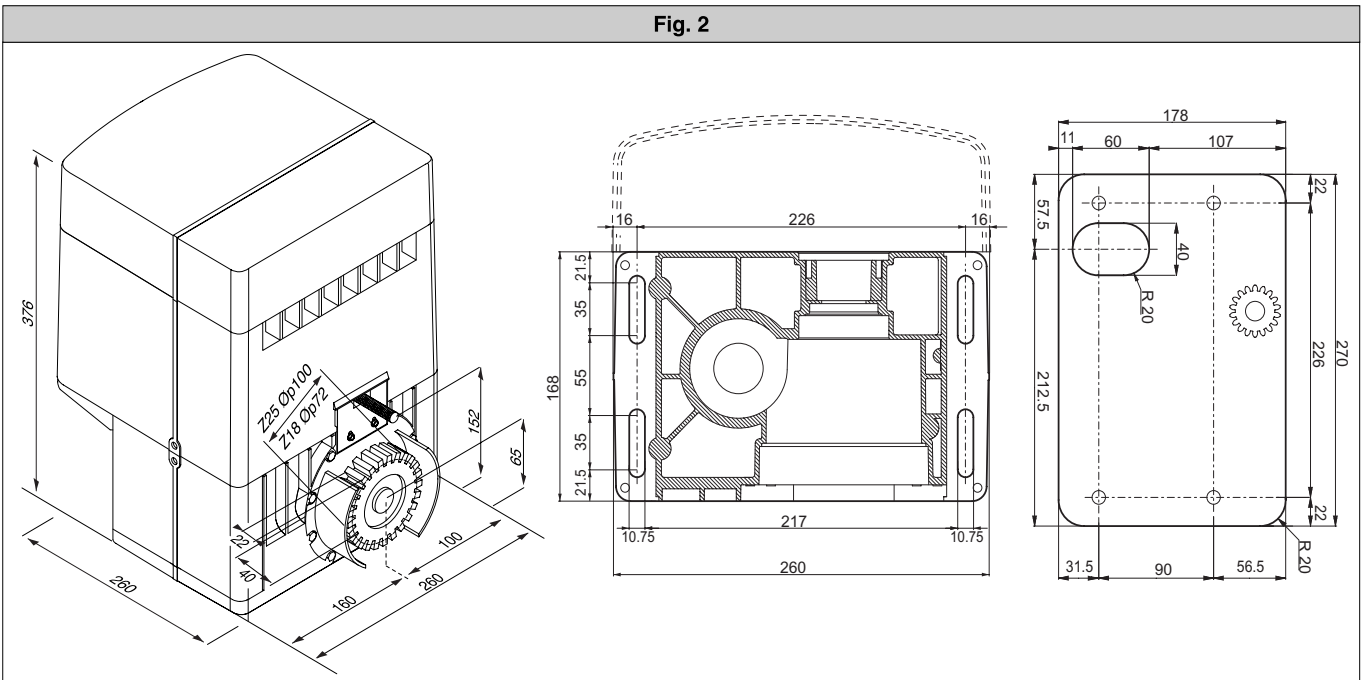


Fig. 3

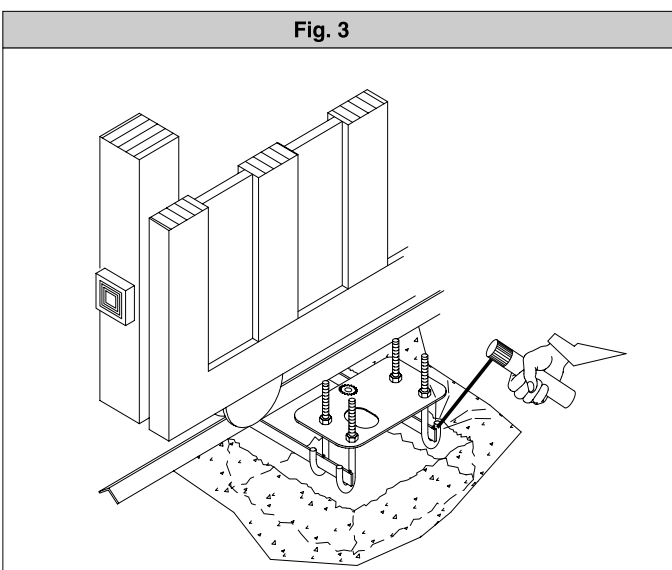


Fig. 4

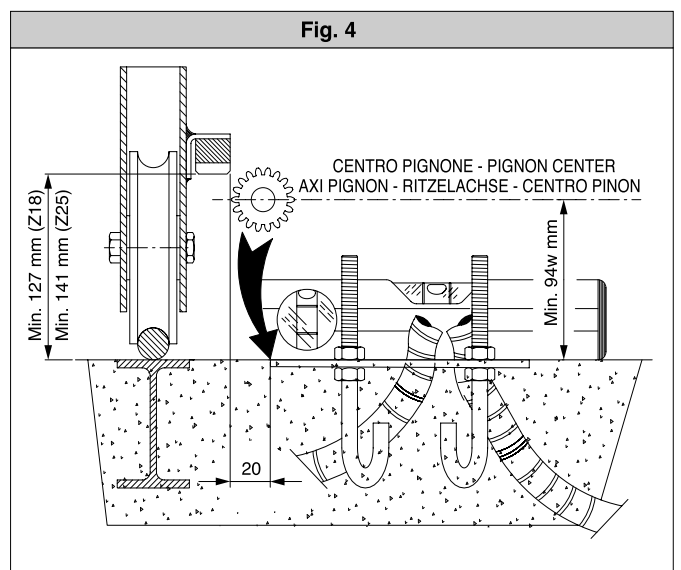


Fig. 5

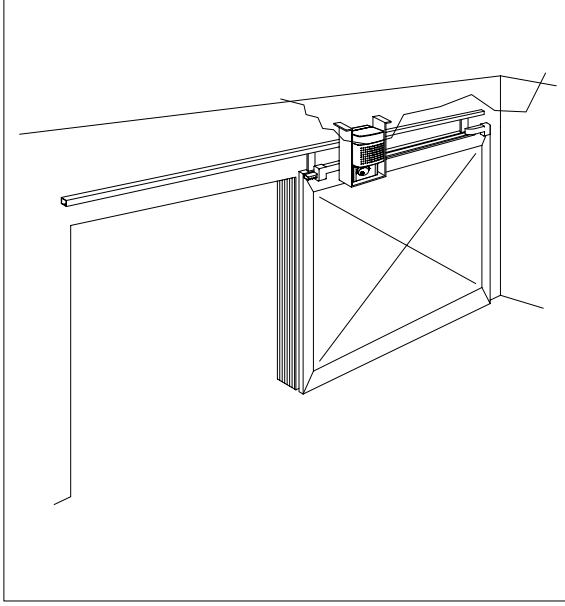


Fig. 6

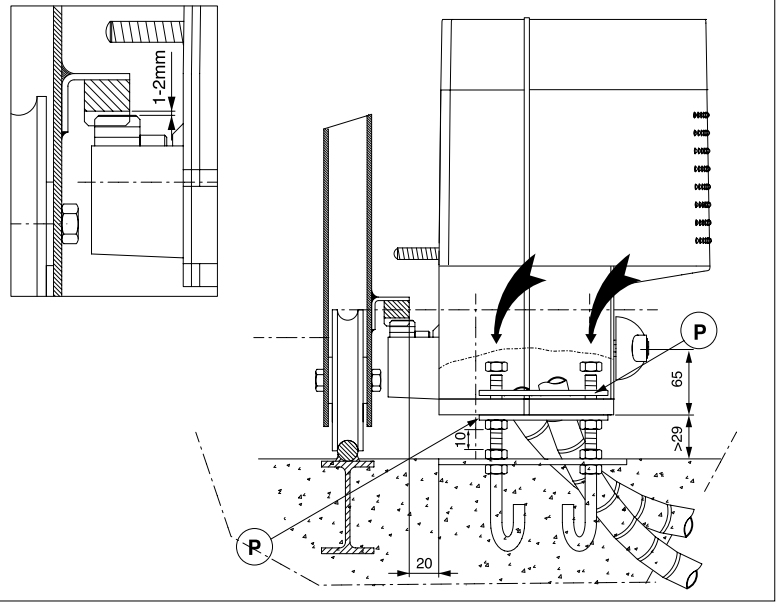


Fig. 7

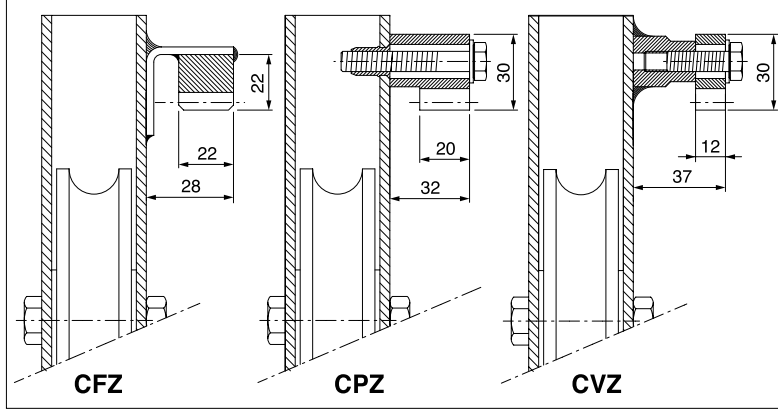


Fig. 8

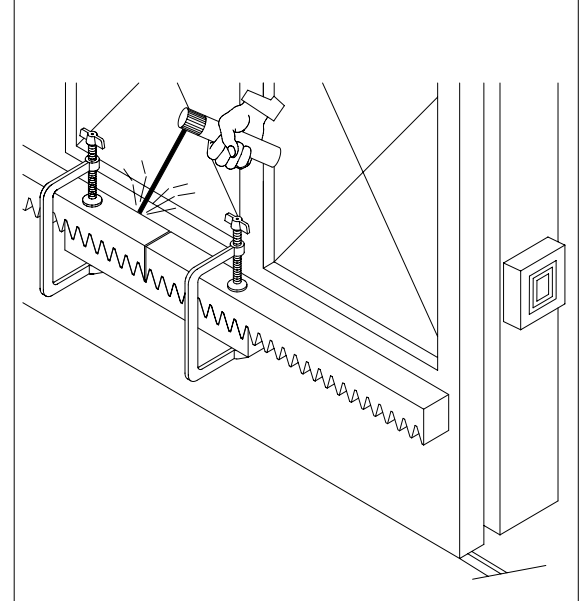


Fig. 9

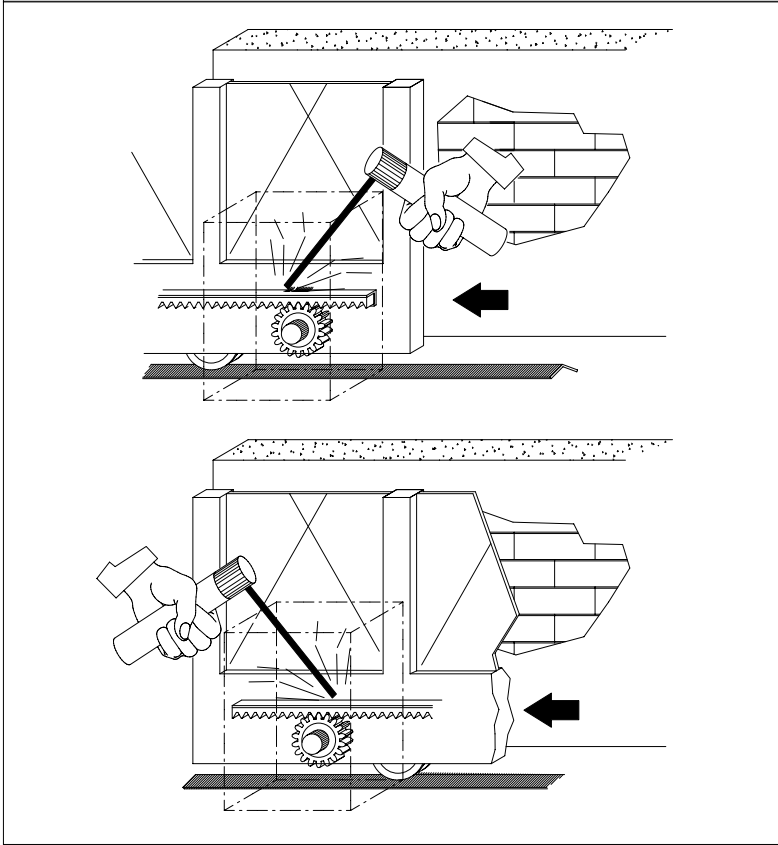


Fig. 10

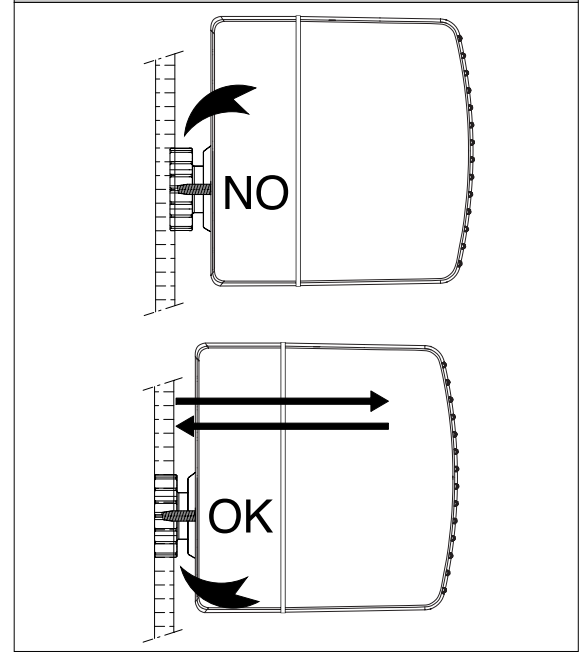


Fig. 11

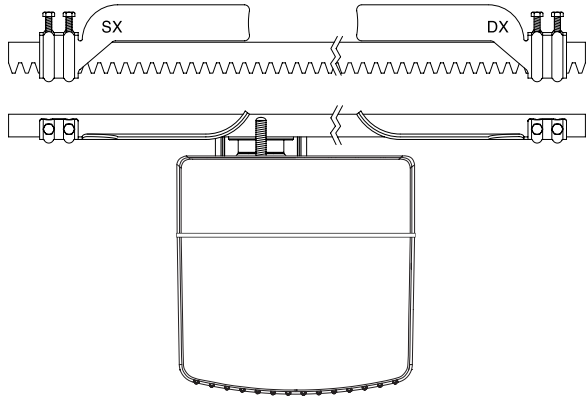


Fig. 12

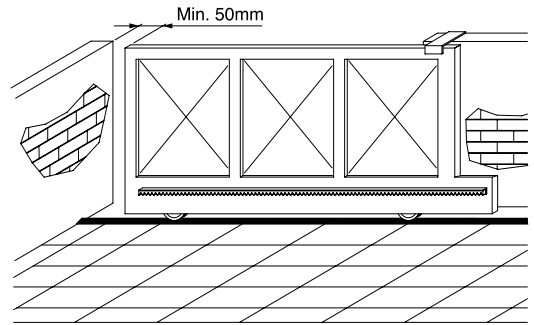


Fig. 13

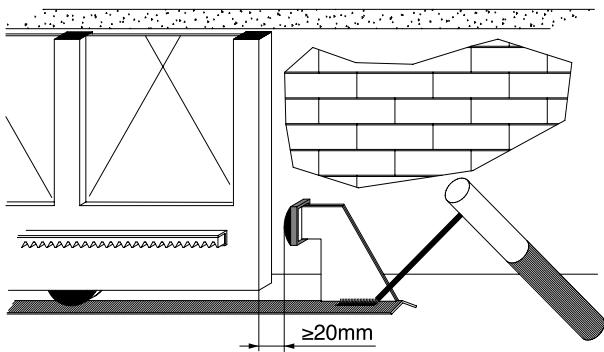


Fig. 14

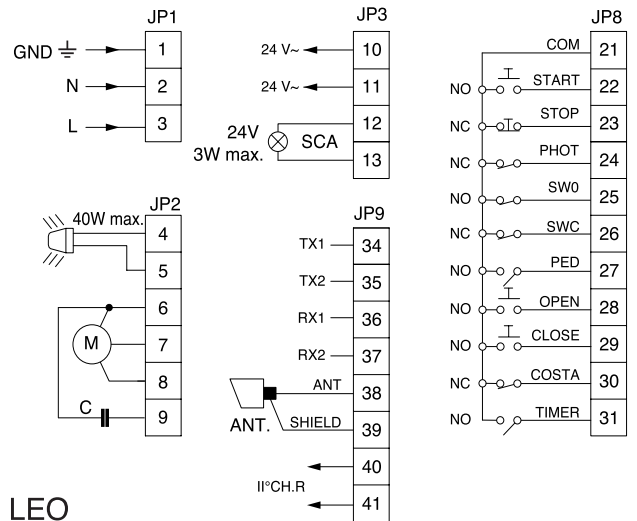


Fig. 15

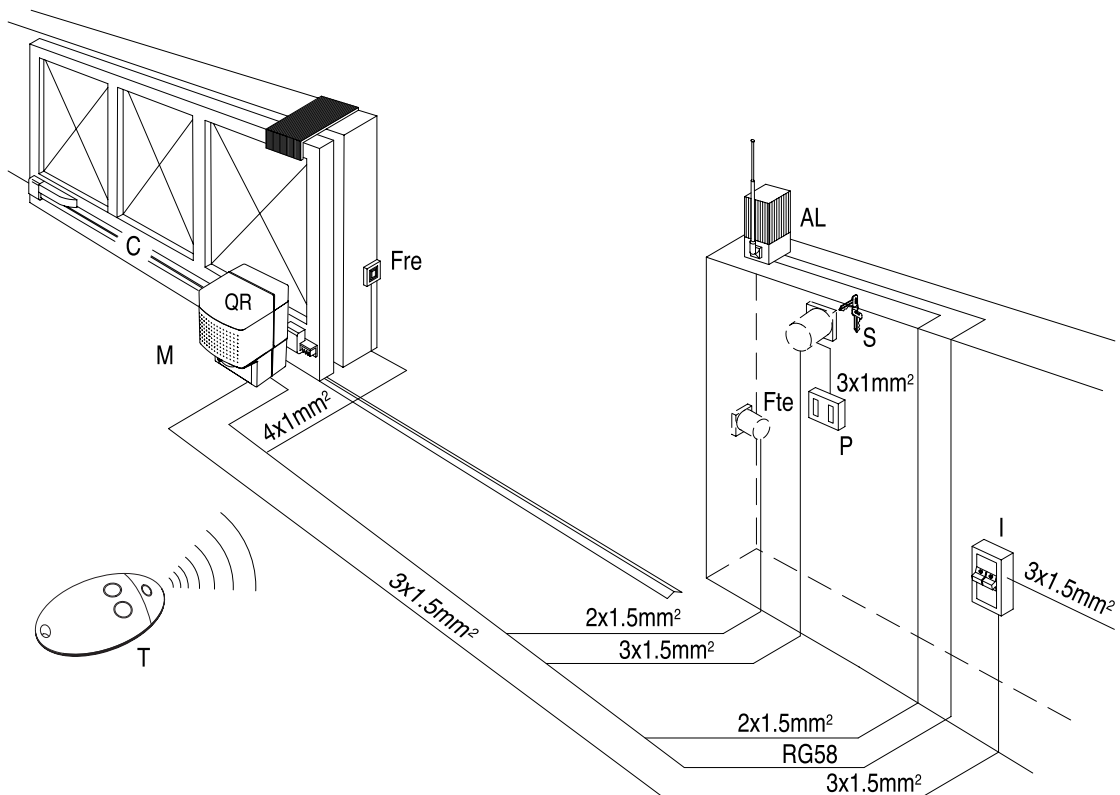


Fig. 16

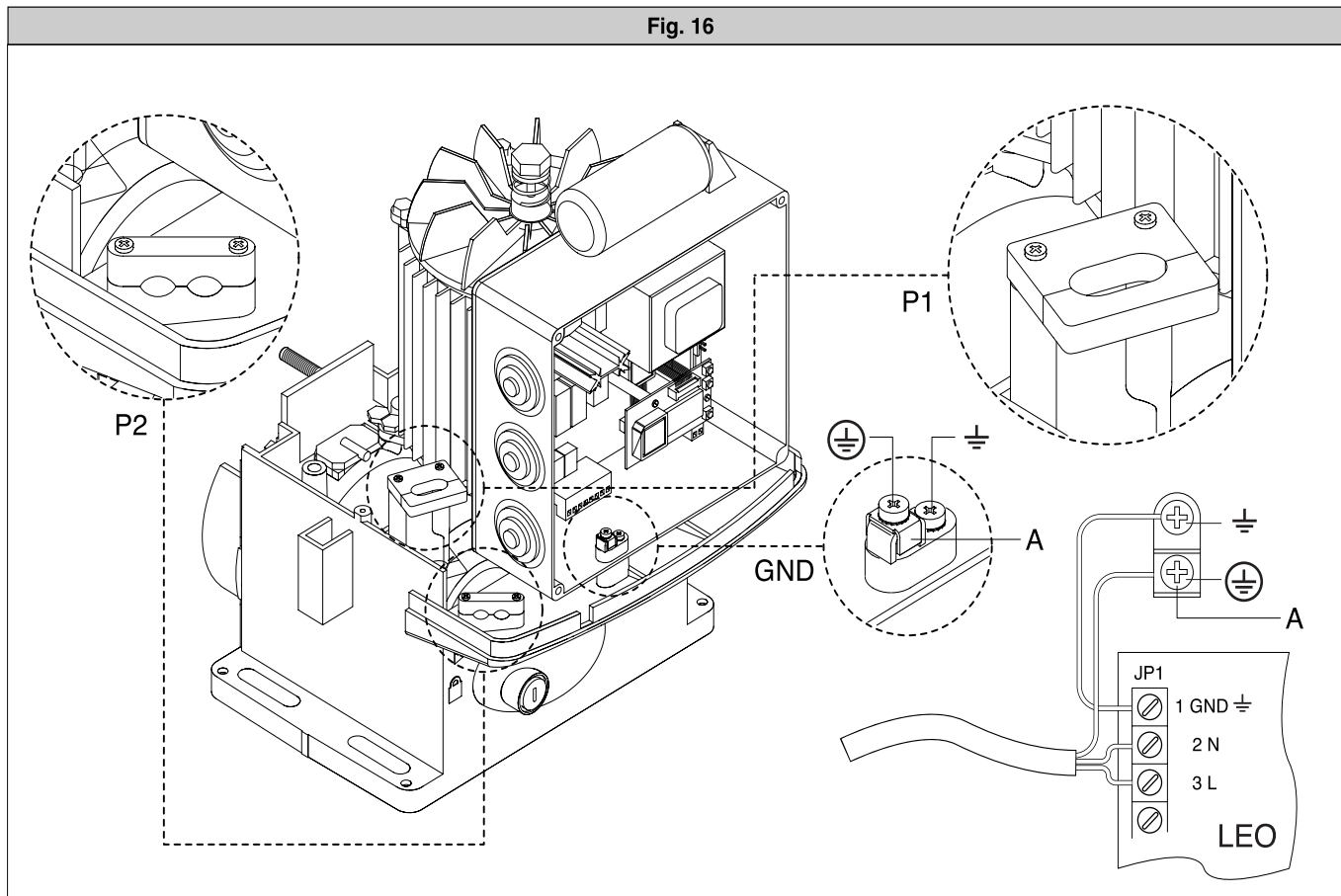


Fig. 17

