

MhouseKit SL0



English

For the automation of sliding gates



Installation instructions and warnings

Information

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1 Warnings

- If this is the first time that you install a SL0 gate automation system we recommend that you dedicate some of your time to reading this manual. You should read it before you start installing the system, so you don't have to rush to finish the work.

Keep all the components of the SL0 system handy so that you can read, check and verify all the information contained in this manual. However, do not carry out the adjustment and memorization stages otherwise, during the actual installation of the products, you will have to deal with settings that differ from the original factory ones.

- When reading this manual, pay special attention to the sections marked by the following symbol:



these sections are particularly important for safety.

- Store this manual safely for future use.
- This manual, as well as the design and manufacture of the devices that make up SL0, comply fully with the standards and regulations in force.
- Considering the hazards that may exist during the installation and operation of SL0, it is necessary that also the installation be carried out in strict compliance with current legislation, standards and regulations, particularly:
 - **This manual contains important information regarding personal safety; before you start installing the components, it is important that you read and understand all the information contained herein. Do not proceed with the installation if you have doubts of any sort; if necessary, refer to the MHOUSE customer service department for clarifications.**
 - **Before you start with the installation, make sure that each single SL0 device is suitable for the intended automation purposes; pay special attention to the data provided in chapter 6 "Technical Characteristics". If even a single device is not suitable for the intended application, do not proceed with the installation.**
 - **Before you start with the installation, check whether additional devices or materials are needed to complete the automation with SL0 based on the specific application requirements.**

- **The SL0 automation system must not be used until the automation has been commissioned as described in paragraph 3.7.2 "Commissioning".**

- **The SL0 automation system cannot be considered as a suitable intrusion protection system. If you require efficient protection you need to integrate SL0 with other devices.**

- **The packing materials for SL0 must be disposed of in compliance with local regulations.**

- **Do not make modifications to any components unless provided for in this manual. This type of operations will only cause malfunctions. MHOUSE disclaims any liability for damage resulting from modified products.**

- **Components must never be immersed in water or other liquids. Also during installation, do not allow liquids to enter the gearmotor or other open devices**

- **In the event that liquid substances have penetrated inside the automation devices, immediately disconnect the power supply and contact the MHOUSE customer service department. The use of SL0 in these conditions can be dangerous.**

- **Keep all components of SL0 away from heat sources and open flames; these could damage the components and cause malfunctions, fire or dangerous situations.**

- **Connect the gearmotor only to a power supply line equipped with safety grounding system.**

- **All operations requiring the opening of the protection shell of any SL0 device must be performed with the gearmotor disconnected from the power supply; if the disconnection device is not identifiable, post the following sign on it: "WARNING: MAINTENANCE WORK IN PROGRESS".**

- **In the event that any automatic switches or fuses are tripped, you must identify the failure and eliminate it before you reset them.**

- **If a failure occurs that cannot be solved using the information provided in this manual, refer to the MHOUSE customer service department.**

2 Product Description

2.1 Applications

SL0 is a set of components designed for the automation of sliding gates in residential applications.

Any applications other than those described above or under different conditions from those specified in this manual are forbidden.

SL0 operates with electric power. In the event of a power failure, the gearmotor can be released using suitable keys in order to move the gate manually.

2.2 Description of the automation

The following example of a typical SL0 application will serve to clarify a few terms and aspects of a gate automation system:

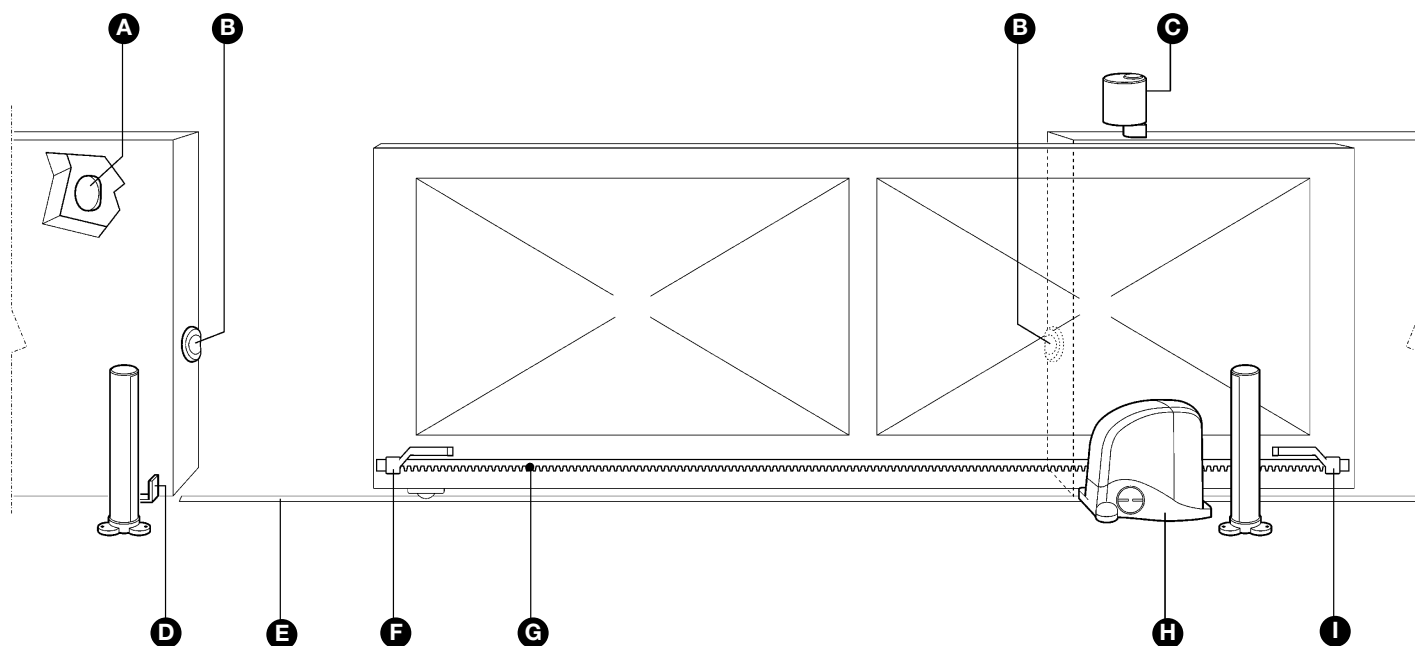


Figure 1

- | | |
|--|---|
| A) KS1 key-operated selector switch | F) Opening limit switch bracket |
| B) Pair of PH0 photocells | G) CR100 rack (not included) |
| C) FL1 flashing light with incorporated aerial. | H) SL0K gearmotor complete with control unit |
| D) Mechanical stop in closing cycle | I) Closing limit switch bracket |
| E) Ground guide (track) | |

2.3 Description of devices

SL0 consists of the devices shown in figure 2; make immediately sure that they correspond to the contents of the package and verify the integrity of the devices.

Note: to adapt SL0 to local regulations, the contents of the package may vary; an exact list of the contents is shown on the outside of the package under the "Mhousekit SL0 contains" heading.

- A) 1 SL0K electromechanical gearmotor with incorporated control unit and foundation plate.
- B) 3 release keys.
- C) 1 pair of PH0 photocells (consisting of a TX and an RX).
- D) 2 TX4 radio transmitters.
- E) FL1 flashing light with incorporated aerial.
- F) 1 KS1 key-operated selector switch and two keys.
- G) 2 limit switch brackets
- H) Miscellaneous small parts: screws, screw anchors, etc. (see tables 1,2,3,4 (*)).

* The screws required for mounting SL0 are not supplied as they depend on the type of material and its thickness.

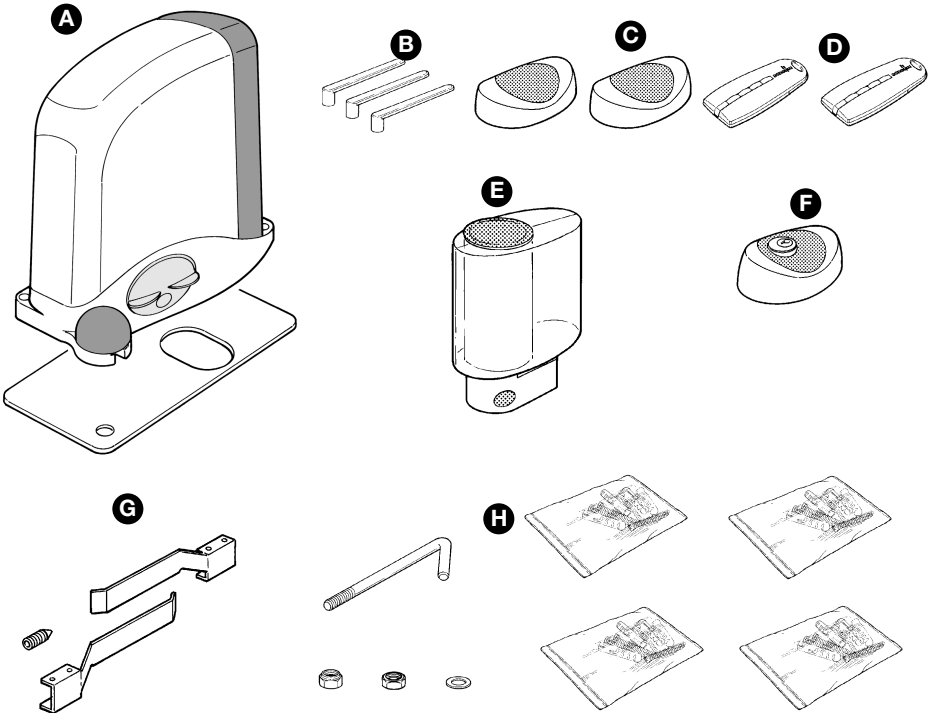


Figure 2

2.3.1 SL0K Electromechanical Gearmotor

SL0 is an electromechanical gearmotor made up of a reducer gear with helical teeth and 24V DC motor; it is equipped with a mechanical release with key to enable manual movement of the gate in the event of a power failure.

The gearmotor is anchored to the ground, to the side of the gate using the special fixing plate and is activated by a rack and pinion system.

The control unit manages the gearmotor and power supply to the various components, and comprises an electronic board with built-in radio receiver.

The control unit can run the gearmotor at two speeds: high and low.

The three keys P1, P2 and P3 [B] and corresponding LEDs are used for control unit programming.

A numbered terminal board [A] is used for the electrical connections. The STOP input is equipped alongside with a status indicator led.

Connection to the mains power could not be easier: simply insert the plug in the mains socket.

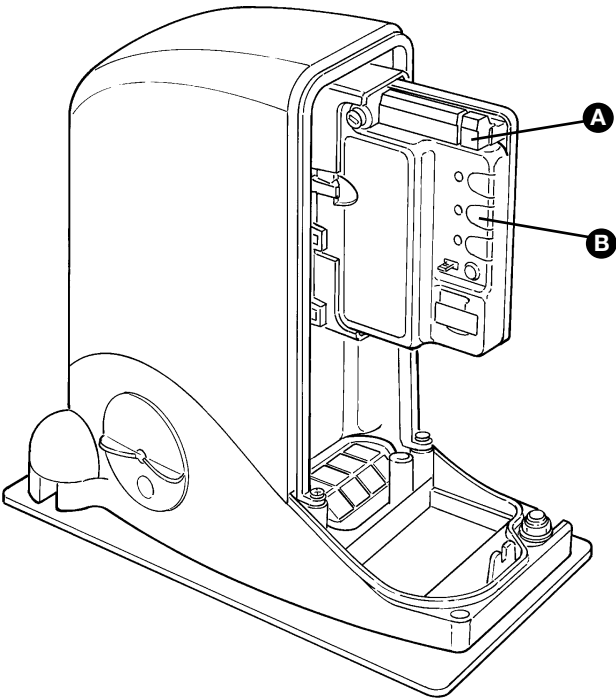


Figure 3

Table 1: List of small parts for a SL0K	Q.ty
Bent pins	2 pcs
M8 nuts	4 pcs
M8 self-tapping nuts	2 pcs
Ø10mm flat washers	2 pcs
6x14mm dowels	4 pcs
8x20mm dowels	4 pcs

2.3.2 Release keys

The three keys enable the gearmotor to be released in the event of a power failure.

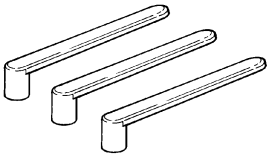


Figure 4

2.3.3 PH0 photocells

The pair of PH0 wall-mounted photocells, once they are connected to the control unit, enable the detection of obstacles found on the optical axis between the transmitter (TX) and the receiver (RX).

Table 3: List of small parts for PH0	Q.ty
HI LO 4X9.5 screw	4 pcs.
3.5X25 self-tapping screw	4 pcs.
s 5 c nylon screw anchor	4 pcs.

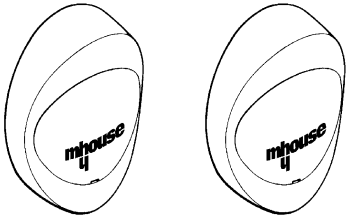


Figure 5

2.3.4 KS1 Key-Operated Selector Switch

The KS1 key-operated two-position selector switch enables gate control without using the radio transmitter. It is equipped with internal light for locating in the dark.

There are two commands, which depend on the direction of rotation of the key: "OPEN" and "STOP"; then the key, which is spring loaded, returns to the centre position.

Table 4: List of small parts for KS1	Q.ty
HI LO 4X9.5 screw	2 pcs.
3.5X25 self-tapping screw	4 pcs.
s 5 c nylon screw anchor	4 pcs.

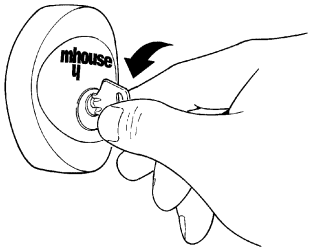


Figure 6

2.3.5 FL1 flashing light with incorporated aerial

The flashing light is controlled by the control unit and signals danger when the gate is moving. Inside the flashing light there is also the aerial for the radio receiver.

Table 5: List of small parts for FL1	Q.ty
4.2X32 self-tapping screw	4 pcs.
s 6 c nylon screw anchor	4 pcs.

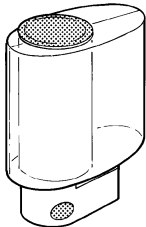


Figure 7

2.3.6 TX4 Radio Transmitters

The radio transmitters are used for the remote control of the gate opening and closing manoeuvres. They feature four buttons that can all be used for the 4 types of command to a single automation unit, or to control up to 4 different automation units.

The transmission of the command is confirmed by the LED [A]; an eye-let [B] allows them to be hung on a keyring.

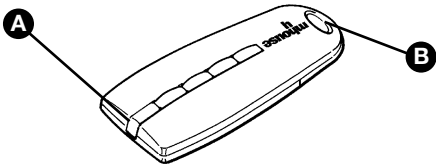


Figure 8

3 Installation

The installation must be carried out by qualified and skilled personnel in compliance with the directions provided in chapter 1 "Warnings".



3.1 Preliminary checks

SL0 must not be used to power a gate that is not efficient and safe. It cannot solve defects resulting from incorrect installation or poor maintenance of the gate.

Before proceeding with the installation you must:

- Make sure that the weight and dimensions of the gate fall within the specified operating limits. If they do not, SL0 cannot be used.
- Make sure that the structure of the gate is suitable for automation and in compliance with regulations in force.
- Make sure that there are no points of greater friction in the opening or closing travel of the gate.
- Make sure there is no danger of the gate derailing.
- Make sure that the mechanical stops are sturdy enough and that there is no risk of the gate derailing out of the ground guide even when it hits the mechanical stop violently.
- Make sure that the gate is well balanced: it must not move by itself when it is placed in any position.
- Make sure that the area where the gearmotor is fixed is not subject to flooding. If necessary, mount the gearmotor raised from the ground.
- Make sure that the installation area is compatible with the size of the gearmotor and that it is safe and easy to release it.

- Make sure there is a suitable fixing surface at the points where the rack is fixed to the gate. For the CR100 rack, see figure 10.

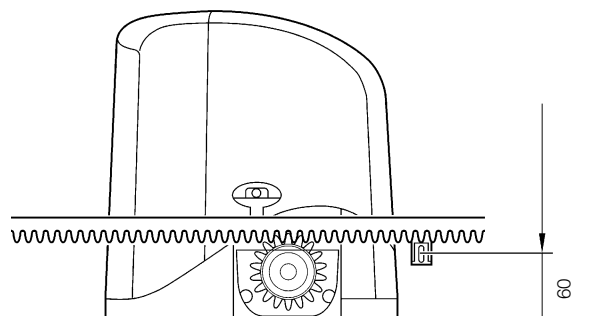


Figure 10

- Both with the gearmotor mounted to the left "LT" and to the right "RT", the distances indicated in figure 11 (gate without rack) or figure 12 (gate with rack) must be respected.

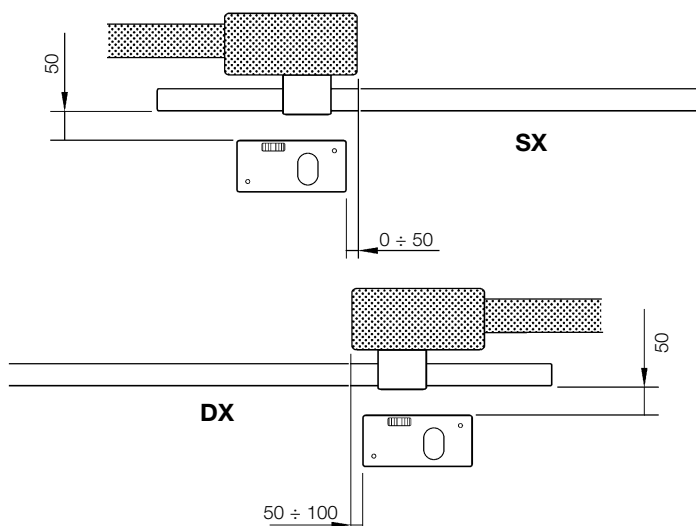


Figure 11

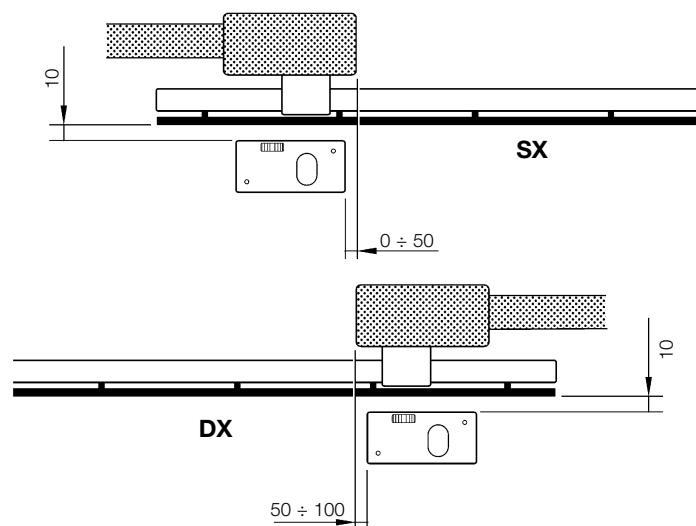


Figure 12

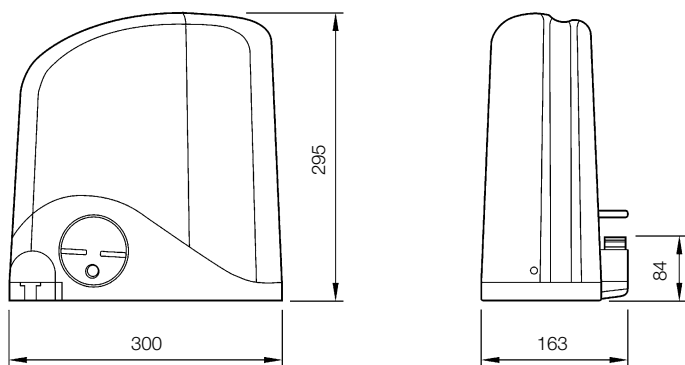


Figure 9

- Make sure that the mounting positions of the various devices are protected from impacts and that the mounting surfaces are sufficiently sturdy.
- Make sure that the mounting surfaces of the photocells are flat and that they enable the proper alignment between TX and RX.

- To mount the limit switch brackets, the rack (and therefore the gate) must project from the axis of the pinion by the distances indicated in figure 13 (LT opening) and figure 14 (RT opening).

If the rack is already mounted on the gate, make sure its position is compatible with the size limits indicated in figure 15 and check that the pitch of the rack is module 4 (approx. 12mm).

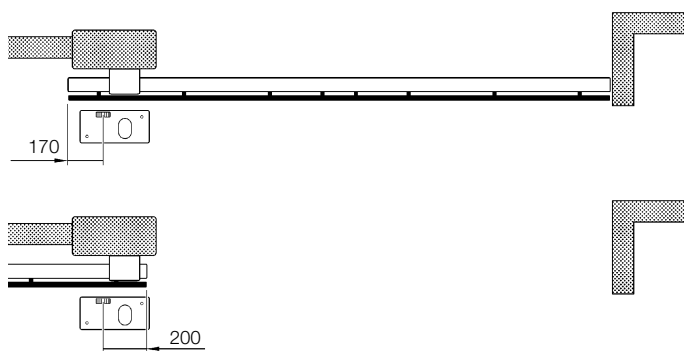


Figure 13

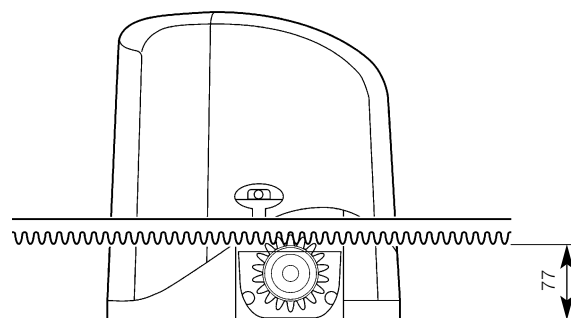


Figure 15

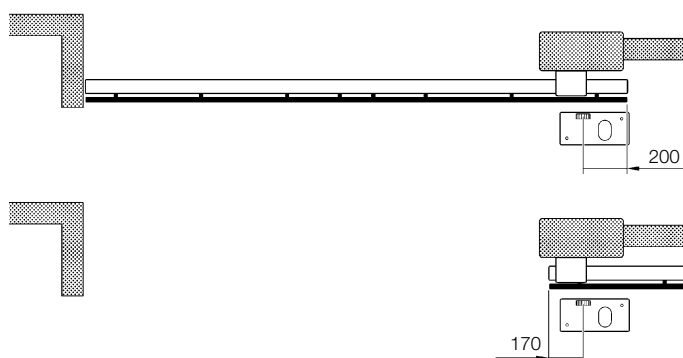


Figure 14

3.1.1 Operating Limits

Chapter 6 "Technical Characteristics" provides the fundamental data needed to determine whether all the SLO components are suitable for the intended application.

In general, SLO is suitable for the automation of gates up to 5 m long, weighing up to 200 kg for residential applications.

The shape of the gate and the climatic conditions (e.g. presence of strong wind) may reduce this maximum limit. In this case it is necessary to measure the torque needed to move the leaves under the worst conditions, and to compare it to the data provided in the technical characteristics chart for the gearmotor.

3.1.2 Tools and Materials

Make sure you have all the tools and materials needed to install the system; make sure that they are in good condition and serviceable according to current safety standards. See examples in figure 16.

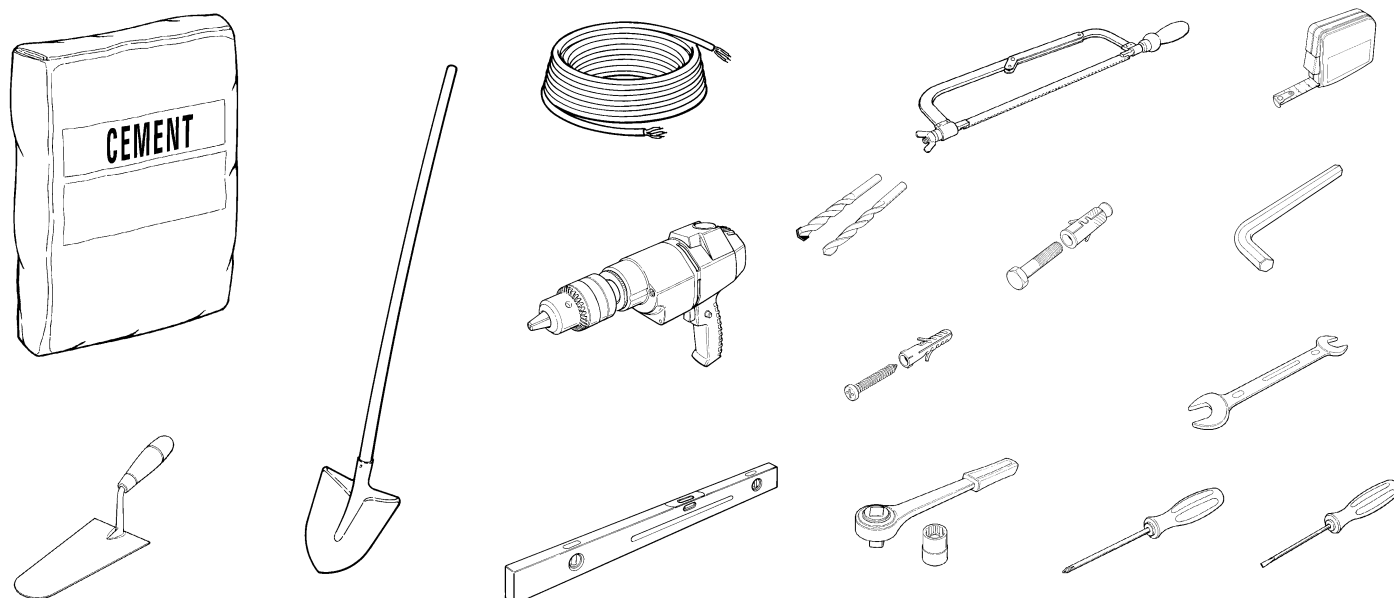


Figure 16

3.1.3 List of cables

The cables required for the installation of SL0 may vary depending on the type and quantity of devices to be installed; figure 17 shows the cables needed for a typical installation; no cable is supplied with SL0.

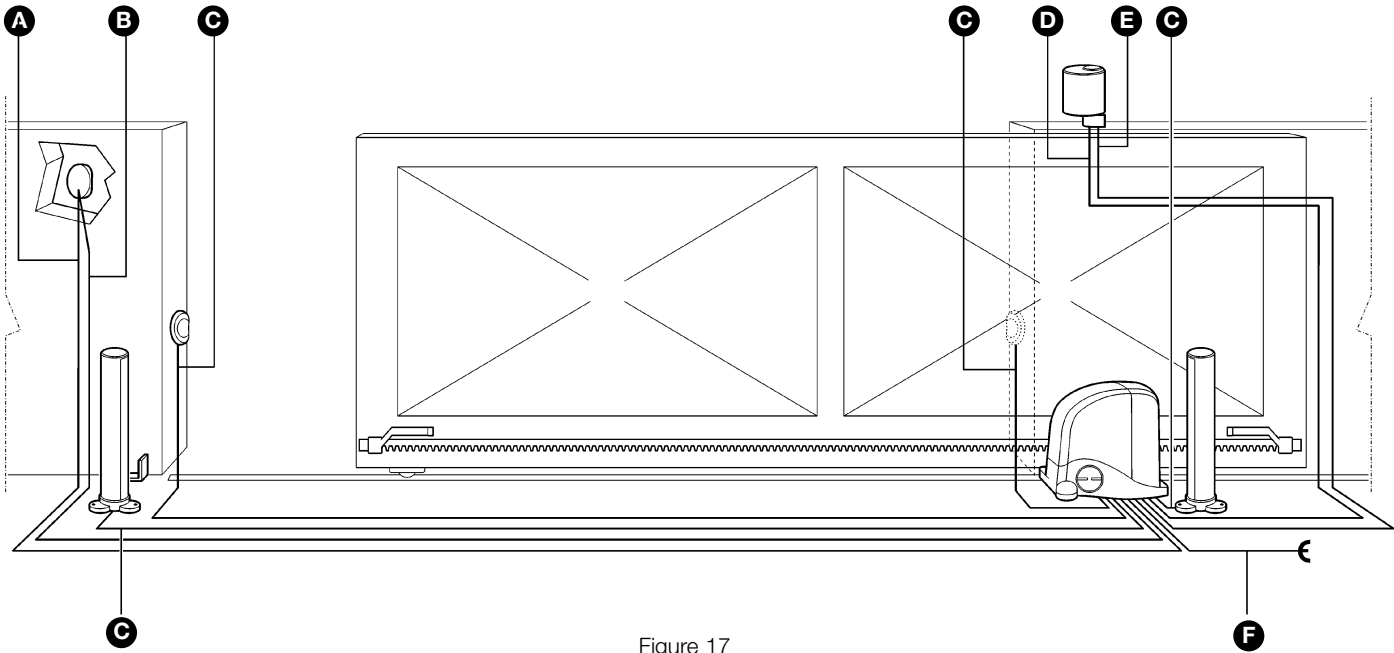


Figure 17

Table 5: List of cables		
Connection	Cable type	Maximum length allowed
[A] STOP input	2x0,5mm² cable	20m (note 2)
[B] OPEN input	2x0,5mm² cable	20m (note 2)
[C] PHOTO input	TX 2x0.25mm² cable RX 2x0.25mm² cable	20m (note 2)
[D] FLASH light output	2x0,5mm² cable	20m
[E] Radio aerial	RG58 type shielded cable	20m (recommended less than 5m)
[F] Power supply line	3x1.5mm² cable	30m (note 1)

WARNING: the cables used must be suitable for the type of installation; for example, an H03VV-F type cable is recommended for indoor applications, while H07RN-F is suitable for outdoor applications.

Note 1: A power supply cable longer than 30 m may be used provided it has a larger gauge, e.g. 3x2.5mm², and that a safety grounding system is provided near the automation unit.

Note 2: For the PHOTO, STOP and OPEN cables, there are no special contraindications to the use of a single cable that groups together multiple connections; for example, the STOP and OPEN inputs can be connected to the KS1 selector switch using a single 4x0,5mm² cable..

3.2 Preparing the Electrical System

With the exception of the power line, the rest of the system uses extra-low voltage (approx. 24V); the wiring can therefore be done by personnel that is not properly qualified, provided that all the instructions in this manual are carefully observed.

After selecting the position of the various devices (refer to figure 1) you can start preparing the conduits for the electrical cables connecting the devices to the control unit.

The conduits are designed to protect the electrical cables and prevent accidental breakage, which may be caused by the passage of vehicles, for instance.

3.2.1 Mains connection

Although connection of the SL0 to the electrical power mains is not specifically dealt with in this manual, note that:

- The electrical mains line must be laid and connected by a professional and qualified technician.
- The electrical mains line must be protected against short circuits and dispersion to earth; a 2-pole disconnection device with a contact gap of at least 3mm must be installed, to enable shut-

off of power supply during installation and maintenance of SL0 (the same plug plus socket is adequate for this purpose).



3.3 Installation of the Various Devices

The SLOK gearmotor can be mounted in the two different situations:

A) Mounting on a gate without rack (paragraph 3.3.1); in this case the gearmotor must be installed first, followed by the CR100 rack.

B) Mounting on a gate with rack (paragraph 3.3.2); in this case the gearmotor must be adapted to the existing rack.

3.3.1 Mounting on gates without rack

1 Dig the foundations according to the "Preliminary checks" paragraph and in particular the distances indicated in figure 11 on page 7.

2 Lay the conduits for the power cables leaving them 30-50 cm longer.

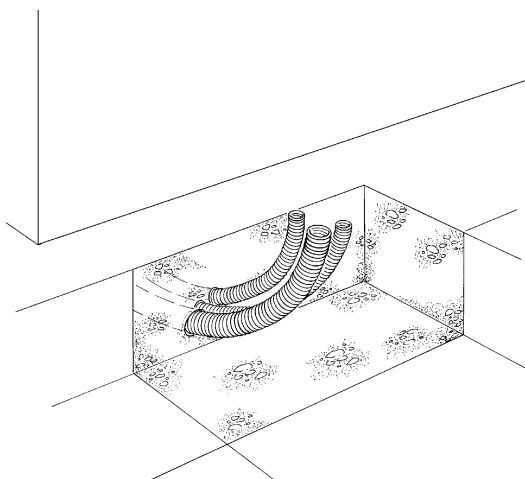


Figure 18

3 Fit the two bent pins **[B]** into the foundation plate and fix them above and below with two M8 nuts **[A]**; make sure the projecting part does not exceed the maximum height indicated in the figure 19.

4 Position the foundation plate making sure that the grooved side (indicating the position of the pinion) faces the gate observing the distances shown in figure 11.

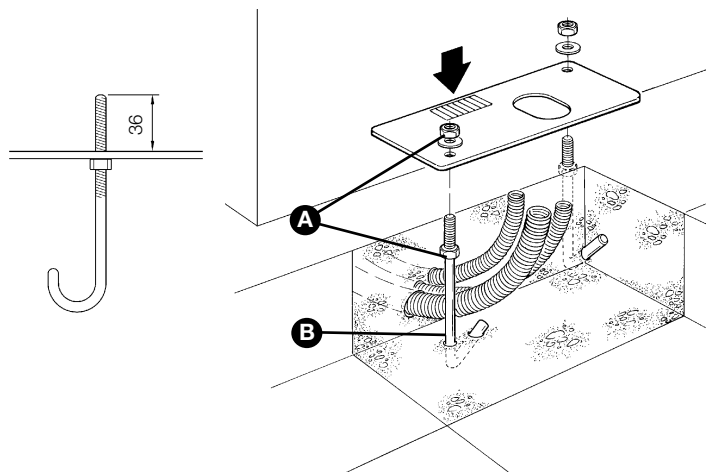


Figure 19

5 Fit the conduits through the hole in the foundation plate.

6 Pour the concrete.

7 Sink the plate into the concrete and make sure it is perfectly level.

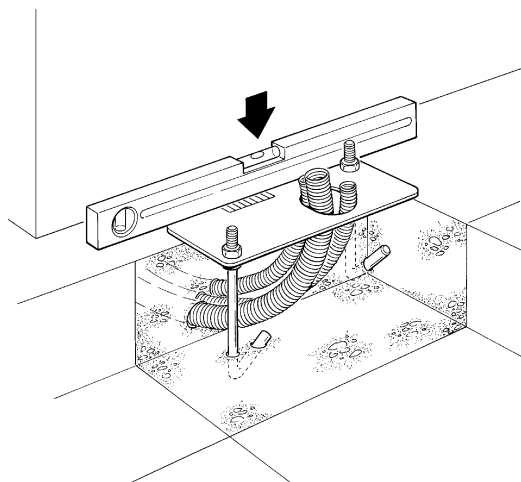


Figure 20

8 When the concrete is dry enough (after a few days), unscrew the two nuts over the plate as they will no longer be used.

9 Cut the cable conduits approximately 3-4cm above the plate.

10 Remove the nut cover on the gearmotor.

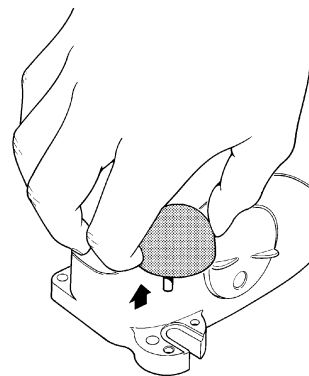


Figure 21

11 Place the gearmotor on the foundation plate, make sure it is perfectly parallel with the gate and fix it with two self-locking nuts **[C]** and washers **[D]**. Thoroughly tighten the two nuts.

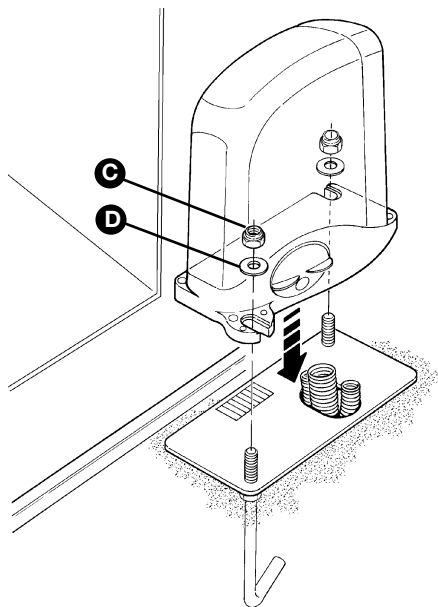


Figure 22

12 Release the gearmotor using the appropriate release keys (see the "Gearmotor release" paragraph on page 36).

13 Fully open the gate and place the first piece of the rack on the pinion so that it projects from the axis of the pinion by the distance indicated in figure 13 or figure 14, that is, the space required for the limit switch brackets.

14 To keep the rack level with the pinion, mark the hole for fixing when the slot matches the axis of the pinion. Repeat this operation for each fixing point.

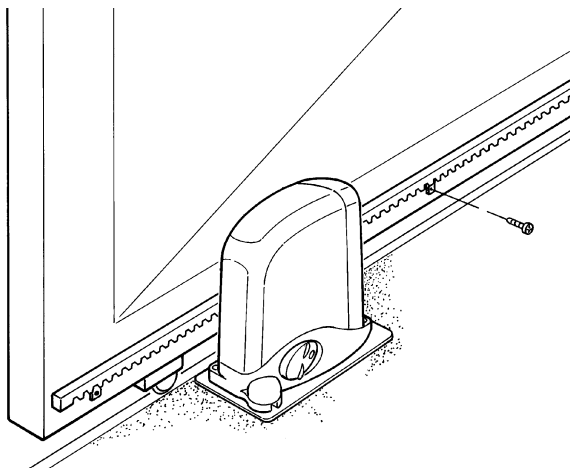


Figure 23

15 Leave a play of 1 mm between the rack and the pinion so that the gate does not weigh on the gearmotor.

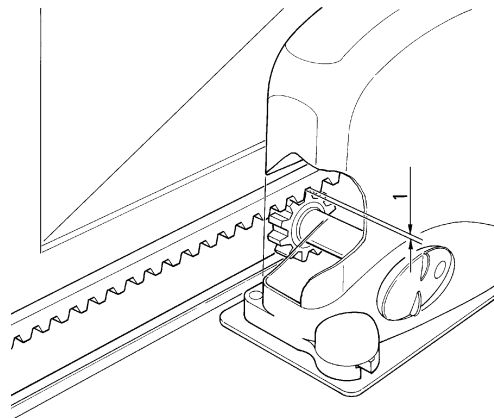


Figure 24

16 Mount the other pieces of the rack and align them one after the other with a play of 1 mm on the pinion.

17 After fixing the last piece, cut away the projecting part of the rack with a hacksaw if necessary.

18 Open and close the gate several times by hand and make sure that the rack is aligned with the pinion with a maximum tolerance of 5mm.

19 Fix the two limit switch brackets with the relative dowels **[E]** to the outer sides of the rack.

Consider that the gate will slide for about another 2-3 cm after the limit switch cuts in. The brackets should be positioned at a sufficient distance from the mechanical stops in order to prevent the gate from jamming.

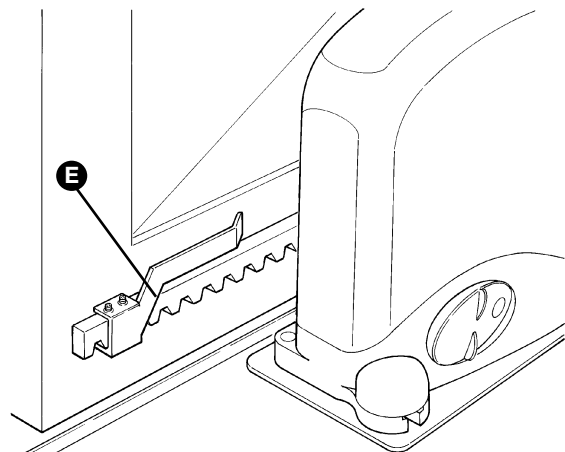


Figure 25

20 To electrically connect the various devices, see paragraph 3.3.6 "Electrical Connections" on page 15.

3.3.2 Mounting on gates with a rack

1 Dig the foundations according to the "Preliminary checks" paragraph and in particular the distances indicated in figure 12 on page 7. Make sure the foundation plate is 77 mm from the rack, see figure 15.

2 Lay the conduits for the power cables leaving them 30-50 cm longer.

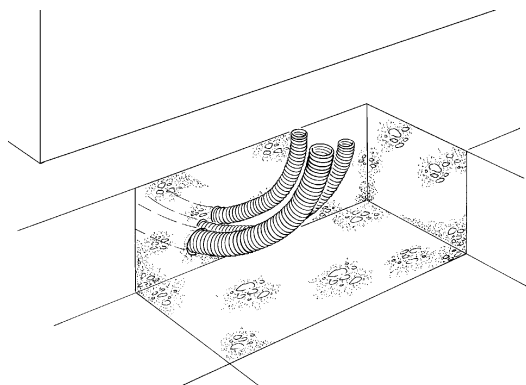


Figure 26

3 Fit the two bent pins **[B]** into the foundation plate and fix them above and below with two M8 nuts **[A]**; make sure the projecting part does not exceed the maximum height indicated in figure 27.

4 Position the foundation plate making sure that the grooved side (indicating the position of the pinion) faces the gate observing the distances shown in figure 12.

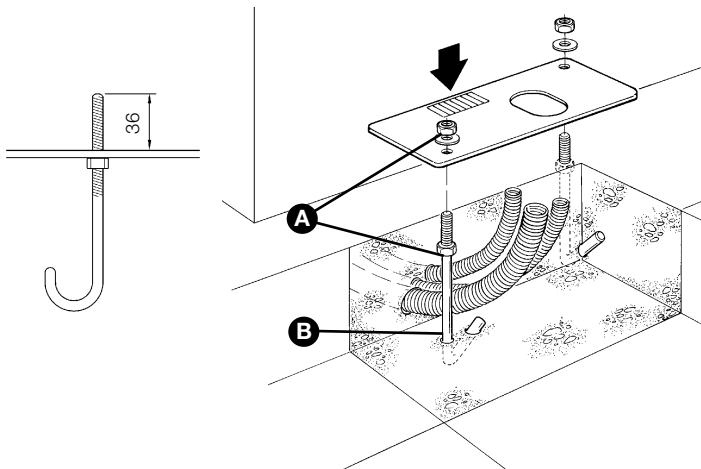


Figure 27

5 Fit the conduits through the hole in the foundation plate.

6 Pour the concrete.

7 Make sure the plate is sunk into the concrete and that it is perfectly level.

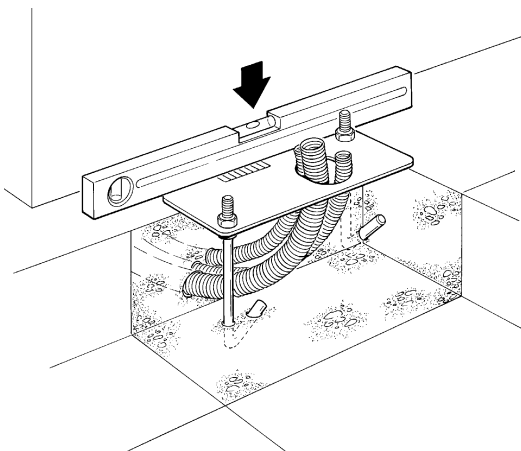


Figure 28

8 When the concrete is dry enough (after a few days), unscrew the two nuts over the plate which will no longer be used.

9 Cut the cable conduits approximately 3-4cm above the plate.

10 Remove the nut cover on the gearmotor.

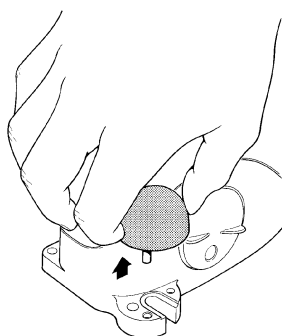


Figure 29

11 Fit the gearmotor to the foundation plate underneath the rack. This operation can be simplified by tilting the gearmotor so that the pinion can easily pass under the rack. Tighten the two self-locking nuts **[C]** a little after fitting the washers **[D]**.

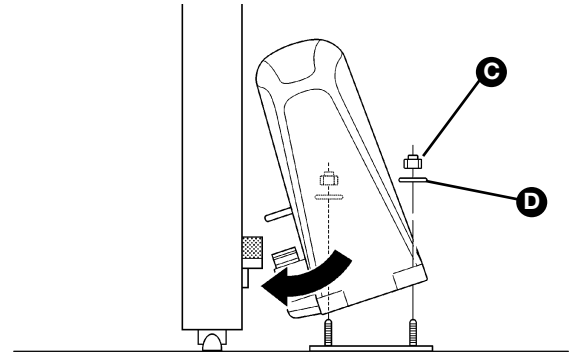


Figure 30

12 If necessary, adjust the height of the gearmotor (Max. 10mm) with the 4 dowels so that there is at least 1mm of play between the rack and the pinion so that the gate does not weigh on the gearmotor. It is better to fix the gearmotor without dowels as it will lie more firmly and securely on the plate.

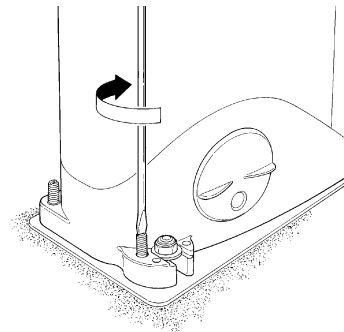


Figure 31

13 Make sure the gearmotor lies perfectly parallel with the gate. Then fix it to the foundation plate and fully tighten the two self-locking nuts **[C]**.

14 Release the gearmotor using the appropriate release keys (see the "Gearmotor release" paragraph on page 36).

15 Open and close the gate several times by hand and make sure that the rack is aligned with the pinion with a maximum tolerance of 5mm.

16 Fix the two limit switch brackets with the relative dowels **[E]** to the outer sides of the rack. Consider that the gate will slide for about another 30mm after the limit switch cuts in. Position the brackets so that the gate does not jam.

17 To electrically connect the various devices, see paragraph 3.3.6 "Electrical Connections" on page 15.

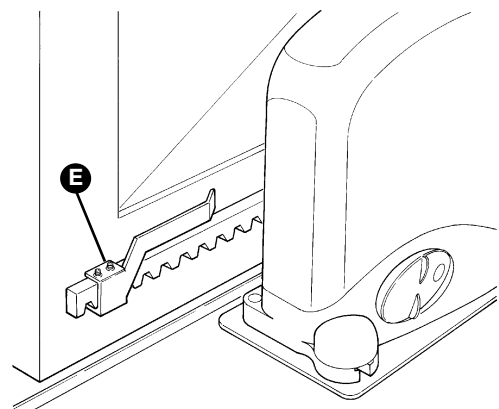


Figure 32

3.3.3 PH0 Photocells

1 Select the position of the two photocell elements (TX and RX) on the basis of the following:

- Place at a height of 40-60 cm from the ground, at the sides of the area to be protected, on the outer side (towards the public way) and as close as possible to the gate axis, i.e. no more than 15 cm.
- Point the transmitter TX at the receiver RX with a maximum tolerance of 5°.
- The two envisaged points must be fitted with a tube for cable routing.

2 Remove the front glass panel **[A]** using a slotted screwdriver to lever off the panel from below.

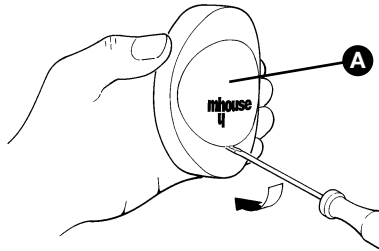


Figure 33

3 Press on the lens to separate the two shells.

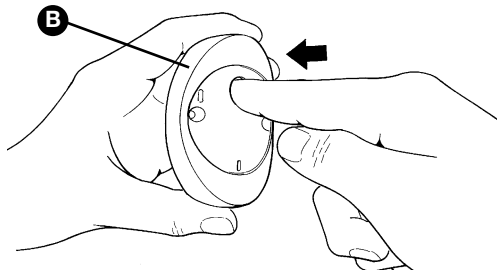


Figure 34

4 Use a screwdriver to puncture two of the four holes **[B]** on the base.

5 Position the photocell where the tube is placed for cable routing, taking care to align the hole on base **[D]** with the cable outlet from the wall; trace the drilling points using the base as a reference.

6 Use a percussion drill with a 5mm bit to drill the wall and insert 5 mm plugs.

7 Secure the base by means of screws **[C]**.

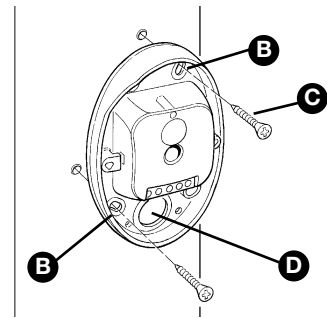


Figure 35

8 Connect the electric cable to the relative terminals of TX and RX. For electrical connections, refer to paragraph 3.3.7 "Electrical connections to the SL0K control unit" and 5.3.1 "Phototest output".

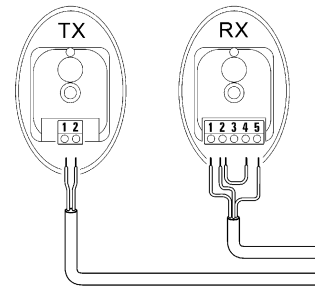


Figure 36

9 Fix the cover shell **[E]** with two screws **[F]** using a Phillips screwdriver. Insert the glass panel **[G]** and press slightly to secure.

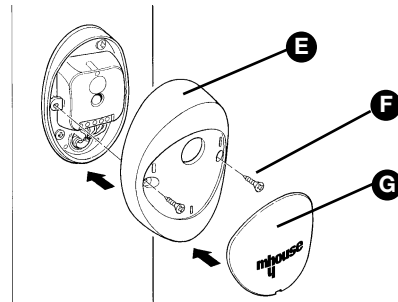


Figure 37

3.3.4 KS1 Key-Operated Selector Switch

1 Determine the position of the selector switch; it must be installed outdoors, alongside the gate and at a height of approx. 80 cm, so that it can be used by people of different height.

2 Remove the front glass **[A]** by prising it out with a slotted tip screwdriver applied to the bottom.

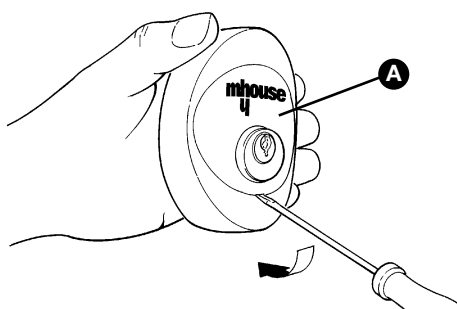


Figure 38

3 To separate the bottom from the shell you need to insert the key and keep it turned, then pull with a finger inserted in the hole for the passage of the cables.

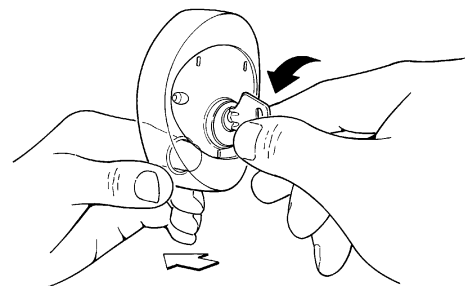


Figure 39

4 Breach the four holes at the bottom with a screwdriver; mark the drilling points using the bottom as reference; make sure that the hole in the bottom matches the outlet for the cables.

5 Drill the holes in the wall using a hammer drill with a 5 mm bit and insert the 5 mm screw anchors.

6 Secure the bottom using the four screws **[B]**.

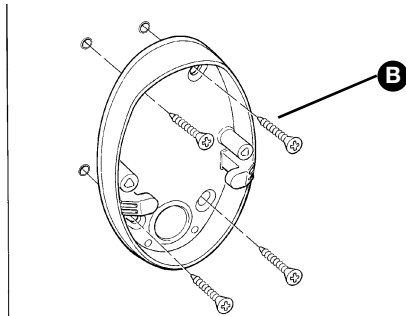


Figure 40

7 Connect the electric cables to the appropriate OPEN and STOP terminals, as shown in figure 41. It is not necessary to observe any polarity. The terminals can be removed in order to facilitate the operations; make the connections and then reinsert them.

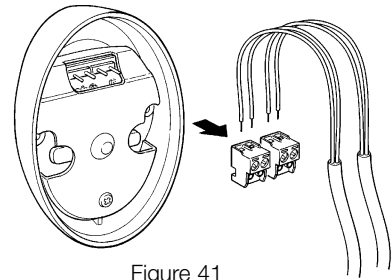


Figure 41

8 To insert the shell on the bottom you need to turn the key. After you have inserted it, turn the key back to the centre position.

9 Secure the body **[C]** using the two screws **[D]** and a Phillips screwdriver. Finally insert the glass **[E]**, pressing it gently to close it.

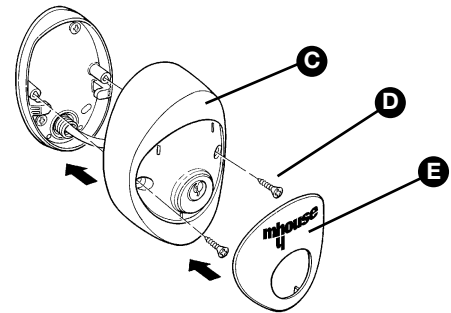


Figure 42

3.3.5 FL1 Flashing Light

1 Determine the position of the flashing light: it should be near the gate and easy to see; it can be secured to a horizontal as well as vertical surface.

2 Slide out the diffuser **[A]** from the bottom by pressing the two buttons **[B]**.

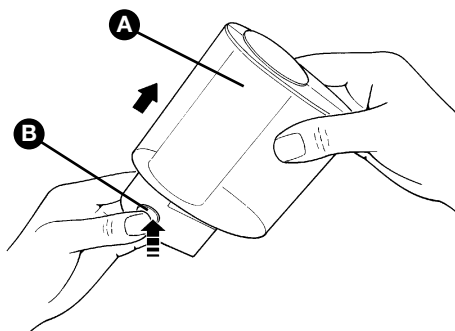


Figure 43

3 Separate the lamp holder with the aerial from the base.

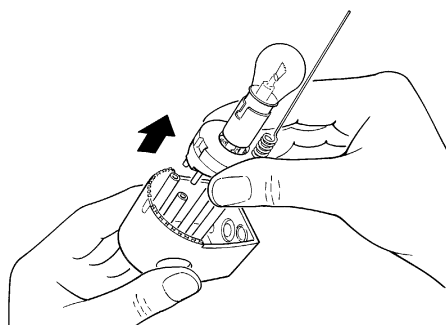


Figure 44

4 Breach the four holes for the screws and the hole for the passage of the cables in the bottom or side, depending on the installation position, using a screwdriver.

5 Mark the drilling points using the bottom as reference and make sure that the hole in the bottom matches the outlet for the cables.

6 Drill the holes in the wall using a hammer drill with a 6 mm bit and insert the 6 mm screw anchors.

7 Secure the bottom with the screws **[C]**.

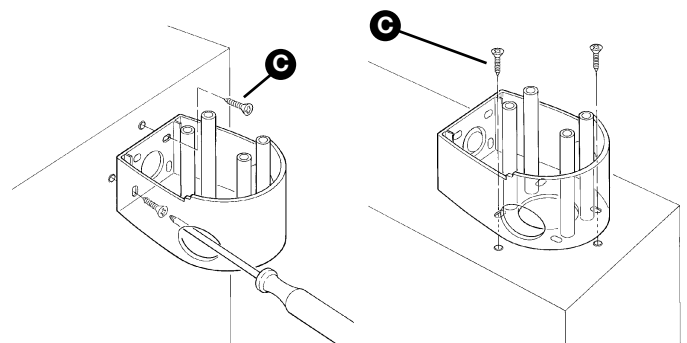


Figure 45

8 Connect the electrical cables to the appropriate FLASH and "aerial" terminals as shown in figure 46. You do not need to observe any polarity on the FLASH terminal; however, for the connection of the shielded cable to the aerial, connect the braid as shown in figure 47. The terminals can be removed in order to facilitate the operations; make the connections and then reinsert them.

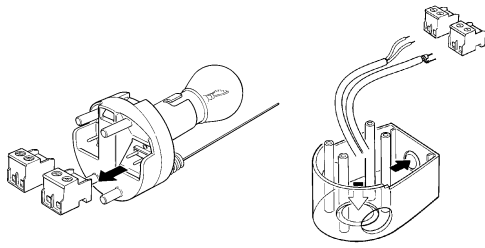


Figure 46



Figure 47

9 Fit the lamp holder on the base and press it down until it snaps into position.

10 Slide in the diffuser, pressing the buttons and fitting it on the bottom. Rotate it in the desired direction then press it down until the two buttons snap into their seat.

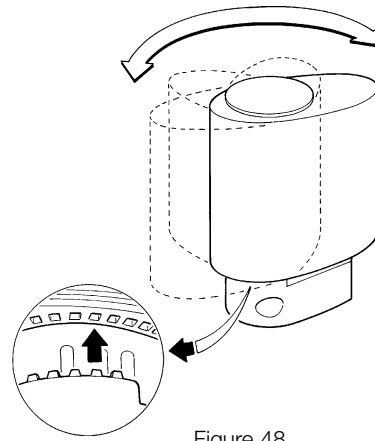


Figure 48

3.3.6 Electrical connections to the SLOK control unit

1 Remove the lateral cover of the gearmotor by removing the screw using a screwdriver and pulling the cover upwards.

3 Remove the rubber membrane closing the hole for cable routing. Route the device connection cables through the special tubes. Leave cable lengths of at least 40-50cm.

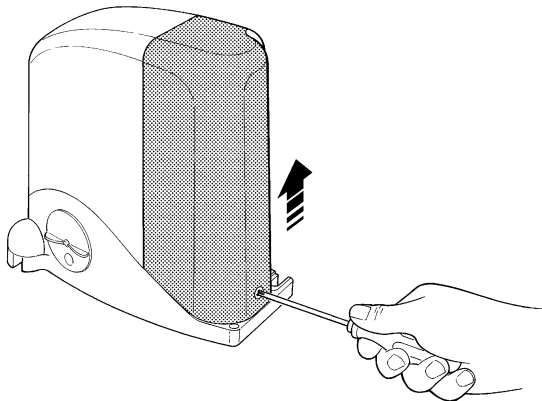


Figure 49

2 Depending on the position of the gearmotor, right-hand or left-hand, adjust the jumper for selection of the direction of the "Open" manoeuvre, as shown in Figure 50 or Figure 51.

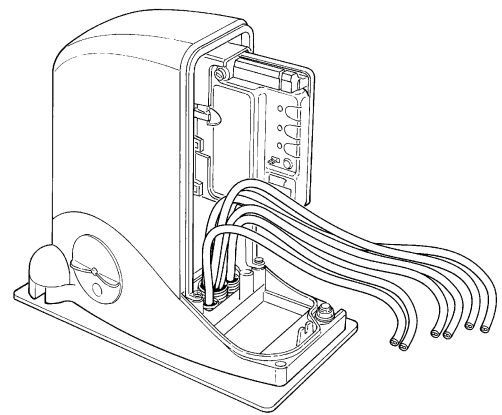


Figure 52

4 Remove an adequate section of internal mesh from the rubber membrane and insert the cables. Insert the membrane in its seat.

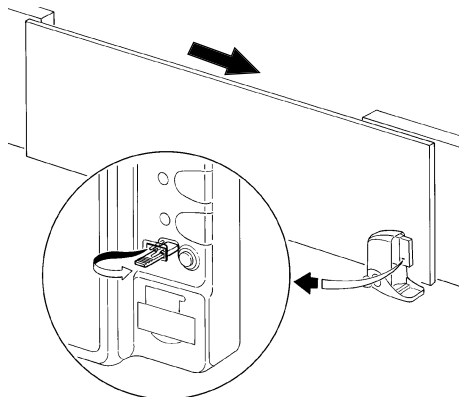


Figure 50

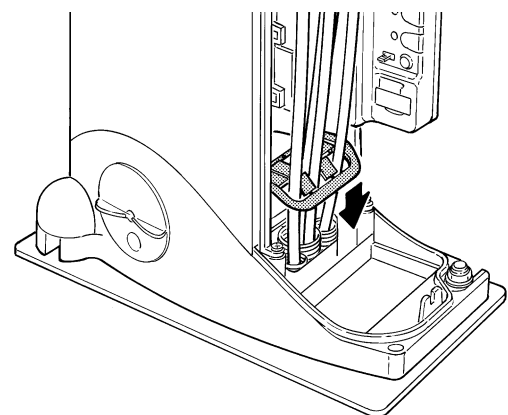


Figure 53

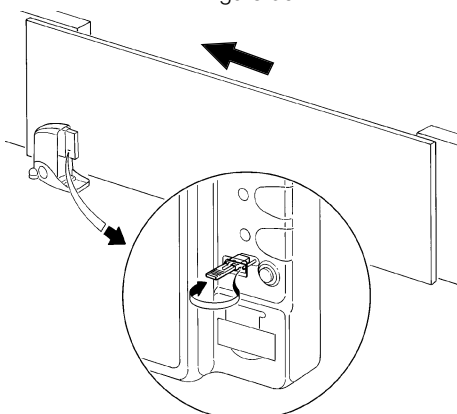


Figure 51

5 Refer to Figure 54 for very low voltage electrical connections of the various devices to the control unit terminals.

- Make connections of the other cables according to the specifications in figure 54. The terminals are removable to facilitate these operations.

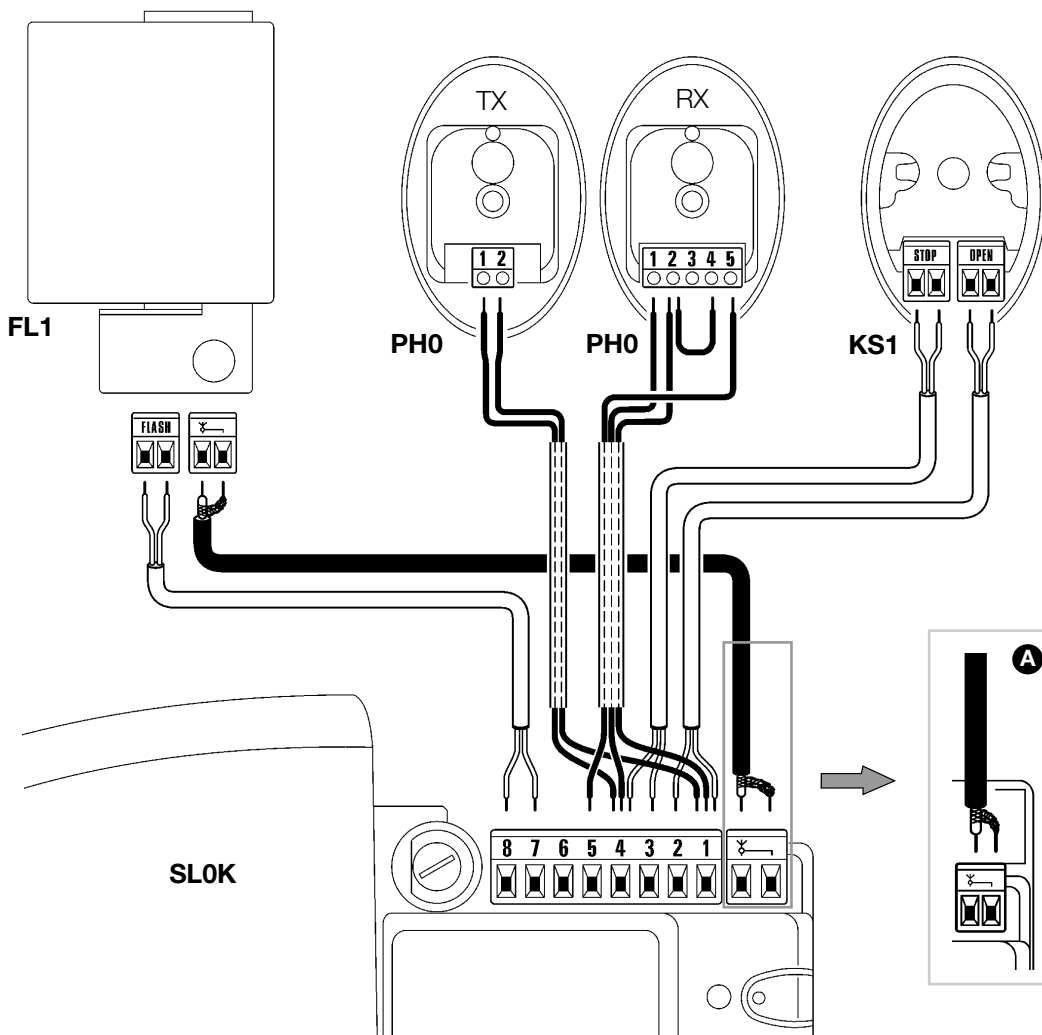


Figure 54

To simplify operations further, terminals **[A]** can be removed as shown in Figure 55; make connections and then reinsert as previously positioned.

6 Re-fit the lateral cover of the SLOK gearmotor by inserting it from above and tightening the screw using a screwdriver.

On completion of connections, use the clips to secure the cables to their fixtures **[B]**.

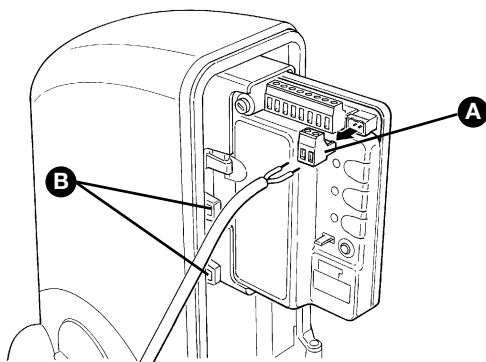


Figure 55

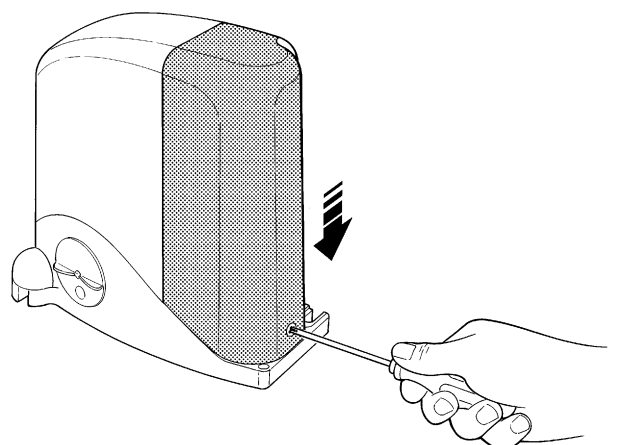


Figure 56

3.4 Power Supply Connection

To carry out tests, insert the plug of the gearmotor in a power supply socket, using an extension lead if necessary.

The gearmotor must be permanently connected to the mains power supply for the testing and commissioning operations.

This operation must be performed as follows by a qualified electrician:

- 1 Make sure that the plug of the gearmotor is not plugged-in to the power socket.
- 2 Disconnect the power cable from the gearmotor power supply terminal
- 3 Slacken the collar beneath the terminal and remove the cable.
- 4 Insert the final power supply cable of the gearmotor through the collar.
- 5 Connect the cable to the terminal of the gearmotor.
- 6 Tighten the collar.

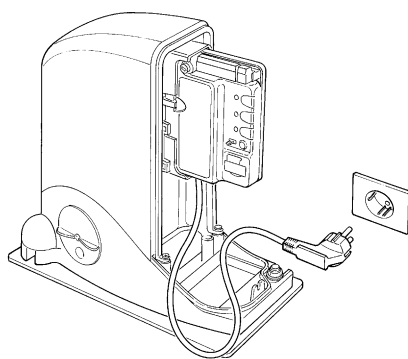


Figure 57

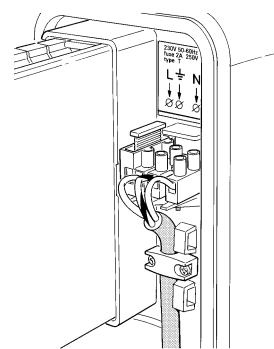


Figure 58

3.5 Preliminary checks

Once the control unit is powered up for the first time, a number of simple checks should be made:

- 1 Ensure that the LED OK **[A]** flashes regularly with approx. one flash per second.

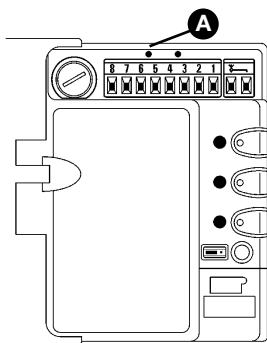


Figure 59

- 2 Ensure that the LED SAFE **[B]** on the photocells is off or flashing; the flashing mode is not important as this depends on other factors. It is only important to ensure that it is not permanently lit.

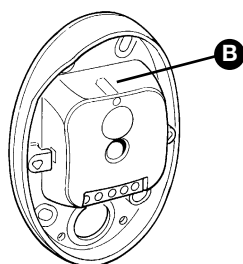


Figure 60

- 3 Ensure that the night-time light **[C]** on key-operated switch KS1 is lit.

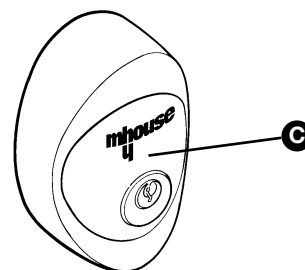


Figure 61

- 4 If not all the above conditions are as specified, shut off power to the control unit and make a thorough check of all cable connections. For other information, refer also to chapters 5.5 "Troubleshooting" and 5.6 "Diagnostics and signals".

3.5.1 Learning the gate opening and closing positions

For correct operation, the control unit needs to recognise the gate opening and closing positions; in this phase the door stroke from the mechanical closing stop to the opening stop is measured.

As well as these positions, the system reads and memorises the configuration of the STOP input and presence (or absence) of the PHOTO input connection in "Phototest" mode.

- 1 Disengage the gearmotor with the special release keys (see paragraph "Gearmotor release", page 34) and move the gate to mid-stroke so that it is free to move in opening and closing, then re-engage the gearmotor.
- 2 Press and hold the key P3 **[A]**.
- 3 Release the keys when the manoeuvre starts (after approx. 3s).
- 4 Check that the manoeuvre in progress is closing, otherwise press key P3 **[A]**, invert the position of the jumper (see fig. 50 and 51) and repeat the procedure from point 1.
- 5 Wait for the control unit to complete the self-learning phase: closing, opening and re-closing of the gate.

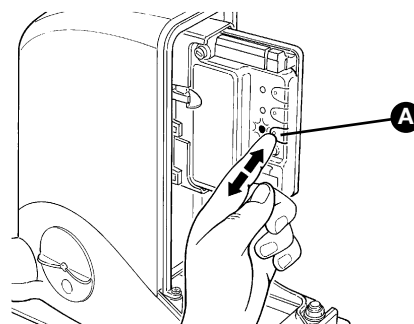


Figure 62

- 6 Make a number of opening and closing manoeuvres, checking that the gate stops on reaching the limit switch at least 2-3 centimetres before the mechanical stops.

3.5.3 Checking the Radio Transmitters

To check the transmitters just press one of the four buttons, make sure that the red LED flashes and that the automation executes the command.

The command associated to each button depends on how they have been memorized (see paragraph 5.4 "Memorization of Radio Transmitters"). The transmitters supplied have already been memorized and when you press the buttons the following commands are transmitted:

Button T1	"OPEN" command
Button T2	"Open pedestrian gate" command
Button T3	"Open only" command
Button T4	"Close only" command

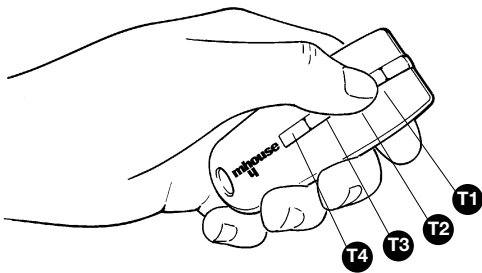


Figure 63

3.6 Regulations

3.6.1 Selecting gate speed

The gate can be opened and closed at two speeds: "slow" or "fast".

To switch from one speed to the other press the P2 button [B] momentarily; the corresponding P2 LED [A] will light up or go off; if the LED is off the speed is "slow", if the LED is on the speed is "fast".

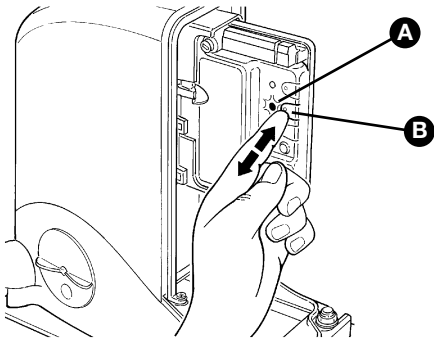


Figure 64

3.6.2 Selecting the Type of Operating Cycle

The opening and closing of the gate can take place according to different operating cycles:

- Single cycle (semiautomatic): the gate opens with a command and stays open until the next command is given, causing it to close.
 - Complete cycle (automatic closing): the gate opens with a command and then closes automatically after a short time (for the time, see paragraph 5.1.1 "Adjusting the Parameters with the Radio Transmitter").
- o switch from one operating cycle to the other, press the P3 button [B] momentarily; the corresponding LED [A] will light up or go off; if the LED is off the cycle is "single", if the LED is on the cycle is "complete".

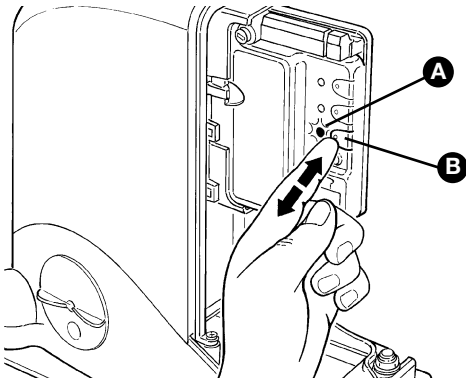


Figure 65

3.7 Testing and Commissioning

These are the most important operations, designed to guarantee the maximum safety and reliability of the automation system.

The testing procedure can also be used as a periodic check of the devices that make up the automation.

The testing and commissioning operations must be performed by qualified and experienced personnel who must establish what tests should be conducted based on the risks involved, and verify the compliance of the system with applicable regulations, legislation and standards, in particular with all the provisions of EN 12445 standard which establishes the test methods for gate automation systems.

3.7.1 Testing

1 Make sure that the provisions contained in chapter 1 "WARNINGS" have been carefully observed.

2 Using the selector switch or the radio transmitter, test the opening and closing of the gate and make sure that the leaves move in the intended direction.

The test should be carried out a number of times to make sure that the gate moves smoothly, that there are no points of excessive friction and that there are no defects in the assembly or adjustments.

3 Check the proper operation of all the safety devices, one by one (photocells, sensitive edges, etc.). In particular, each time a device is activated the "ECSBus" LED on the control unit flashes for a longer time, confirming that the control unit recognizes the event.

4 To check the photocells and make sure that there is no interference with other devices, pass a 5 cm diameter, 30 cm long cylinder on the optical axis, first near TX, then near RX and finally at the mid-point between them and make sure that in all these cases the device is triggered, switching from the active to the alarm status and vice-versa; finally, that it causes the intended action in the control unit, for example that it causes the reversal of the movement during the closing manoeuvre.

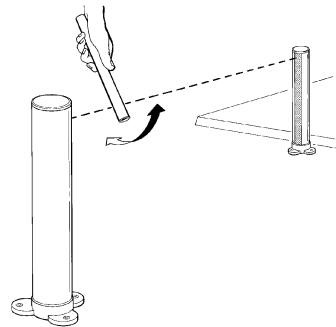


Figure 66

5 Measure the impact force according to EN 12445 standard. If "motor force" control is used to assist the system for the reduction of the impact force, try to find the adjustment that gives the best results.

3.7.2 Commissioning

The commissioning operations can be performed only after all the tests have been successfully carried out. Partial commissioning or implementation of "temporary" conditions are not permitted.

1 Prepare the technical documentation for the automation, which must include at least: assembly drawing (e.g. figure 1), wiring diagram (e.g. figure 17), analysis of hazards and solutions adopted, manufacturer's declaration of conformity of all the devices installed. Use enclosure "EC Declaration of conformity of the SLO components" for SLO.

2 Post a label on the gate providing at least the following data: type of automation, name and address of manufacturer (person responsible for the "commissioning"), serial number, year of manufacture and "CE" marking.

3 Fill out the declaration of conformity and deliver it to the owner of the automation system; for this purpose you can use Annexe 2 "EC Declaration of Conformity".

4 Prepare the operating guide and deliver it to the owner of the automation system; Annexe 3 "OPERATING GUIDE" can be used as an example.

5 Prepare the maintenance schedule and deliver it to the owner of the automation system; it must provide directions regarding the maintenance of all the automation devices.

6 Before commissioning the automation system inform the owner regarding dangers and hazards that are still existing.

4 Maintenance

The maintenance operations must be performed in strict compliance with the safety directions provided in this manual and according to the applicable legislation and standards.

The devices used for the SLO automation system do not require any special maintenance. However, periodically make sure (at least once every six months) that all the devices are perfectly efficient.

To this end, carry out all the tests and checks described in paragraph 3.7.1 "Testing" and the operations described in paragraph 7.3.3 "Maintenance Operations to Be Performed by the User".

If other devices are present, follow the directions provided in the corresponding maintenance schedule.

4.1 Dismantling and Disposal

SLO is constructed of various types of materials, some of which can be recycled (aluminium, plastic, electric cables), while others must be disposed of (electronic boards).

WARNING: some electronic components may contain polluting substances; do not pollute the environment. Enquire about the recycling or disposal systems available for SLO in compliance regulations locally in force.

1 Contact a qualified electrician regarding the disconnection of the automation system from the electric mains.

2 Disassemble all the devices and accessories, following in reverse order the procedures described in chapter 3 "Installation".

3 Remove the batteries from the radio transmitters.

4 Remove the electronic boards.

5 Sort the various electrical and recyclable materials and consign them to licensed firms for recovery and disposal.

6 Consign the remaining materials to authorized scrap collection centres.

5 Additional information

The following chapters describe different ways of customizing SL0 to make it suitable for specific application requirements.

5.1 Advanced Adjustments

5.1.1 Parameter settings via radio transmitter

The radio transmitter enables the entry of a number of control unit operating parameters: there are three parameters, each of which can be set with three different values:

1) Pause time: time in which the gate remains open (in the case of automatic closure).

2) "OPEN" function: sequence of movements associated with each "OPEN" command;

3) Motor force: maximum force over which the control unit detects an obstacle and inverts gate movement.

Table 6

Parameter	N°	Value	Action: operation required in point 3 of the settings phase
Pause time	1°	15s	Press key T1 once
	2°	30s (*)	Press key T1 twice
	3°	60s	Press key T1 three times
"OPEN" function	1°	"Open"- "Stop"- "Close"- "Stop"	Press key T2 once
	2°	"Open"- "Stop"- "Close"- "Open" (*)	Press key T2 twice
	3°	"Open"- "Open"- "Open"- "Open" (opening only)	Press key T2 three times
Motor force	1°	Low	Press key T3 once
	2°	Medium	Press key T3 twice
	3°	High (*)	Press key T3 three times

(*) Original factory setting

The parameter setting procedure can be performed with a radio transmitter, provided this is memorised in mode 1, as the one supplied. If a transmitter memorised in mode 1 is not available, a single one may be memorised for this phase and then deleted immediately afterwards (see paragraph 5.4.1 "Mode 1 memorisation" and paragraph 5.4.4 "Deleting a radio transmitter").

CAUTION: when making settings via a transmitter, ensure that the control unit has the time to recognise the commands via radio; in practice the keys must be pressed and released slowly, pressing them for at least one second, releasing them for one second and so on..

1 Press radio transmitter keys T1 and T2 together for at least five seconds.

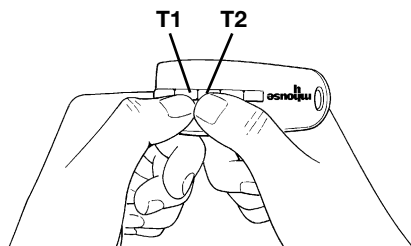


Figure 67

2 Release the two keys.

3 Within three seconds, execute the action specified in Table 6 on the basis of the parameter to be modified.

Example: to set the pause time at 60 s.

- 1 Press and hold keys T1 and T2 for at least 5s
- 2 Release keys T1 and T2
- 3 Press key T1 three times

All parameters can be set as required without any contraindication; only the "motor force" setting requires special conditions:

- Never enter high force values to compensate for the fact that the door has anomalous points of friction. Excessive force may impair correct operation of the safety system or damage the gate.
- If the "motor force" control is used as a support for the system for force impact reduction, after each setting, repeat force measurement as envisaged in the standard EN 12445.
- Weather conditions can influence gate movements, and adjustments may need to be repeated periodically.

5.1.2 Checking settings via radio transmitter

With a transmitter memorised in mode 1, the user can check settings of all parameters at any time as follows:

1 Press radio transmitter keys T1 and T2 together for at least five seconds.

2 Release the two keys.

3 Within three seconds, execute the action specified in Table 7 on the basis of the parameter to be modified.

4 Release the key when the relative indicator starts to flash.

Table 7

Parameter	Action
Pause time	Press and hold the key T1
"OPEN" function	Press and hold the key T2
Motor force	Press and hold the key T3

5 Count the number of flashes; according to the number of flashes, check Table 6 for the corresponding value.

Example: After pressing T1 and T2 for 5s and then T1, if the flashing light emits three flashes, the set pause time is 60s.

5.2 Optional Accessories

In addition to the devices featured in SL0, other ones are available as optional accessories designed to enhance the automation system.

For information on the new accessories, refer to the MHOUSE catalogue or visit the site www.mhouse.biz.

5.3 Adding or Removing Devices

Devices can be added to or removed from the SL0 automation system at any time.

Do not add any devices until you have made sure that they are perfectly compatible with SL0; for further information contact MHOUSE Customer Service.

5.3.2 STOP Input

STOP is the input that causes the immediate interruption of the manoeuvre (with a short reverse run). Devices with output featuring normally open "NO" contacts (like the KS1 selector switch) and devices with normally closed "NC" contacts, as well as devices with 8.2KΩ constant resistance output, like sensitive edges, can be connected to this input. Multiple devices, even of different type, can be connected to the STOP input if suitable arrangements are made.

To do this, proceed as described in the following table:

Table 8		1st device type:		
		NO	NC	8,2kΩ
2nd device type	NO	in parallel (note 2)	(note 1)	in parallel
	NC	(note 1)	in series (note 3)	in series
	8,2KΩ	in parallel	in series	not permitted (note 4)

Note 1. The NO and NC combination can be obtained by placing the two contacts in parallel, and placing in series to the NC contact an 8.2KΩ resistance (therefore, the combination of 3 devices is also possible: NO, NC and 8.2KΩ).

Note 2. Any number of NO devices can be connected to each other in parallel.

Nota 3. Any number of NC devices can be connected to each other in series.

Nota 4. Only 1 device with constant 8.2KΩ resistance output can be connected; if multiple devices are used, these must be connected in cascade with a single terminating 8.2KΩ resistance.

Warning: if the STOP input is used to connect devices with safety functions, only the devices with 8.2KΩ constant resistance output guarantee the fail-safe category 3.

During the recognition stage the control unit, like ECSBus, recognizes the type of device connected to the STOP input; subsequently it commands a STOP whenever a change occurs in the recognized status.

5.3.2 Phototest output

This control unit is equipped with the function "Phototest" which increases reliability of the safety devices, enabling classification in "category 2" according to the standard EN 954-1 (ed. 12/1998) governing the control unit and safety photocell assembly.

Each time a manoeuvre is started, the safety devices involved are checked and the manoeuvre is enabled only if the correct conditions are present. If the test fails (photocell "blinded" by sunlight, cables shorted etc.) the fault is identified and the manoeuvre is not performed.

To add a pair of photocells, remove the jumper and make the connections as described below.

The power supply to the photocell transmitters is not fed directly from the services output, but from the "Phototest" output between terminals 8-6. The maximum usable current on the "Phototest" output is 100mA.

If 2 pairs of photocells are used with the risk of interference, activate the synchronism mechanism as described in the photocell instructions.

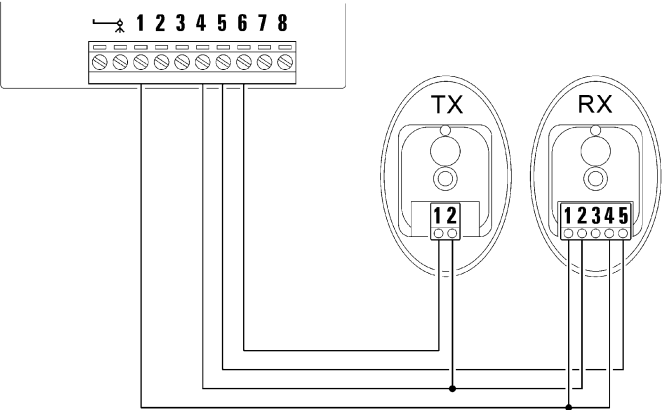


Figure 68

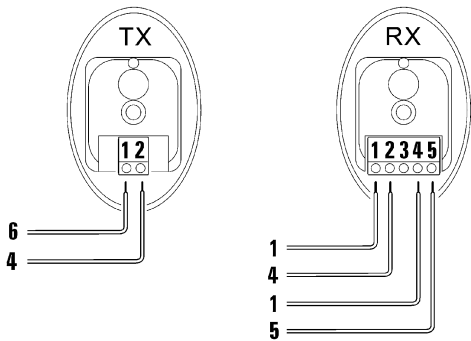


Figure 69

5.4 Memorization of Radio Transmitters

The control unit contains a radio receiver for TX4 transmitters; those included in the package are pre-memorized and operative.

If you wish to memorize a new radio transmitter you have two choices:

- **Mode 1:** in this "mode" the radio transmitter is used to its fullest extent, i.e. all the buttons execute a pre-established command (the transmitters supplied with SL0 are memorized in Mode 1). It is obvious that in Mode 1 a radio transmitter can be used to command a single automation, i.e.:

T1 button	"OPEN" command
T2 button	"Pedestrian gate" command
T3 button	"Open only" command
T4 button	"Close only" command

- **Mode 2:** one of the four commands available can be associated to

each button. This mode, used properly, allows you to command 2 or more different automations; for example:

T1 button	"Open only" command Automation N. 1
T2 button	"Close only" command Automation N. 1
T3 button	"OPEN" command Automation N. 2
T4 button	"OPEN" command Automation N. 3

Each transmitter is, of course, a separate unit, and while some are memorized in mode 1 others can be memorized in mode 2 on the control unit.

The overall memory capacity is 150 units; memorization in mode 1 takes up one unit for each transmitter while mode 2 takes up one unit for each button.

Warning: since the memorization procedures are timed (10s), you must read the instructions in the following paragraphs before you proceed with their execution.

5.4.1 Memorization Mode 1

1 Press button P1 **[B]** for at least 3s. When the P1 LED **[A]** lights up, release the button.

2 Within 10s, press any button on the radio transmitter to be memorized and hold it down for at least 3s.

If the memorization procedure is successful, the "P1" LED will flash 3 times.

3 If there are other transmitters to be memorized, repeat step 2 within the next 10s, otherwise the memorization stage will terminate automatically.

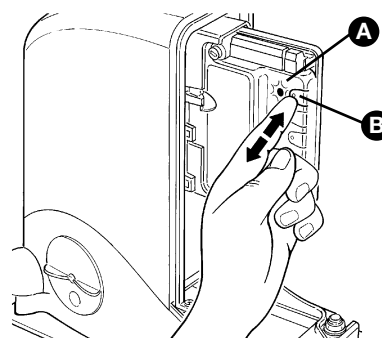


Figure 70

5.4.2 Memorisation mode 2

With memorisation of the radio transmitter in Mode 2, each key can be associated with one of the four commands: "OPEN", "Partial Open", "Open only" and "Close only".

In Mode 2 each key requires a specific memorisation phase.

1 Delete the remote control by completing the procedure "5.4.4 Deleting a radio transmitter".

2 Press key P1 (Figure 70) on the control unit the same number of times as the number of the required command, according to the following table: (e.g. 3 times for the command "Open only").

Once	"OPEN" command
Twice	"Pedestrian opening" command
Three times	"Open only" command
Four times	"Close only" command

3 Ensure that the LED P1 emits a number of quick flashes corresponding to the number of the selected command.

4 Within 10 seconds, press the radio transmitter key to be memorised for at least 2 seconds.

If memorisation is successful, the LED "P1" emits 3 slow flashes.

5 If there are other transmitters to be memorised for the same type of command, repeat step 3 within another 10 s, otherwise the memorisation phase is terminated automatically.

5.4.3 "Remote" Memorization

A new radio transmitter can be memorized in the control unit without directly operating the buttons on it. You need to have an "OLD" pre-memorized operational radio transmitter. The "NEW" radio transmitter to be memorized will inherit the characteristics of the OLD one, i.e. if the OLD radio transmitter was memorized in Mode 1, the NEW one will also be memorized in Mode 1. In this case, during the memorization stage you can press any key on the two transmitters. If, on the other hand, the OLD transmitter was memorized in Mode 2 you must press the button on the OLD transmitter which corresponds to the desired command, and the button on the NEW transmitter to which you wish to associate that command.

Holding the two transmitters, position yourself within the operating range of the automation and perform the following operations:

1 Press the button on the NEW radio transmitter and hold it down for at least 5s, then release it.

2 Press the button on the OLD radio transmitter 3 times slowly.

3 Press the button on the NEW radio transmitter once slowly.

At this point the NEW radio transmitter will be recognized by the control unit and will assume the characteristics of the OLD one.

If there are other transmitters to be memorized, repeat all the steps above for each new transmitter.

5.4.4 Deleting a Radio Transmitter

If a radio transmitter is available, this operation allows you to delete it.

If the transmitter is memorized in Mode 1, a single deletion stage is sufficient: just press any button at point 3. If the transmitter is memorized in Mode 2, one deletion stage is needed for each memorized button.

- 1 Press and hold down button P1 [B] (Figure 71) on the control unit.
- 2 Wait until the P1 LED [A] lights up, then, within three seconds:

3 Press and hold down for at least three seconds the button of the radio transmitter to be deleted.If the radio transmitter has been deleted, the P1 LED will flash quickly five times. If the LED flashes slowly just once, it means that the deletion has not taken place because the transmitter is not memorized

- 4 If there are more transmitters to be deleted, repeat step 3 within ten seconds while pressing button P1, otherwise the deletion stage will terminate automatically.

5.4.5 Deleting all the Radio Transmitters

With this operation all the memorized transmitters are deleted.

- 1 Press the P1 button [B] on the control unit and hold it down.
- 2 Wait until the P1 LED [A] lights up, then wait until it goes off, then wait until it has flashed 3 times.
- 3 Release the P1 button precisely upon the third flash.
- 4 Wait approximately 4s for the deletion process to be completed; during this time the LED will flash very quickly.

If the procedure is successful, after a few moments the "P1" LED will flash slowly 5 times.

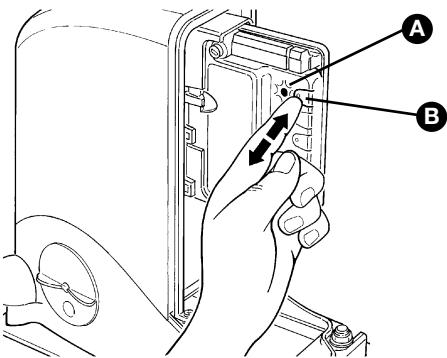


Figure 71

5.5 Troubleshooting

The following table provides a guideline to malfunctions that may occur during installation or in the event of faults, with suggested remedies.

Table 9	
Symptom	Probable cause and remedy
The radio transmitter does not emit any signal (LED [A] does not light up)	<ul style="list-style-type: none">• Check whether the batteries are discharged; replace if necessary (page 36)
The manoeuvre is not started and the LED "OK" [B] does not flash	<ul style="list-style-type: none">• Check that the power cable is inserted correctly in the electrical mains socket• Check that fuses [D] or [E] have not tripped; in this case check the cause of the fault and replace the fuse with an identical version.
The manoeuvre is not started and the flashing light remains off	<ul style="list-style-type: none">• Check that the command is effectively received. If the command reaches the OPEN input, the relative LED "OK" [B] should light up.
The manoeuvre is not started and the flashing light flashes briefly	<ul style="list-style-type: none">• Check that the STOP input is active, i.e. that the LED "STOP" [C] is lit. If this does not occur, check the device connected to the STOP input.• The photocell test performed at the start of each manoeuvre is not successful; check also with reference to Table 10 on page 24.
The manoeuvre starts but inversion occurs immediately afterwards.	<ul style="list-style-type: none">• The selected force is too low to move the gate. Check whether there are any obstacles and if necessary select a higher force as described on page 21.
The manoeuvre is executed but the flashing light does not work	<ul style="list-style-type: none">• Check during the manoeuvre that there is voltage on the terminal FLASH of the flashing light (as this is intermittent the voltage value is not significant: around 10-30Vac); if voltage is present, the problem is due to the lamp which should be replaced with an identical version.

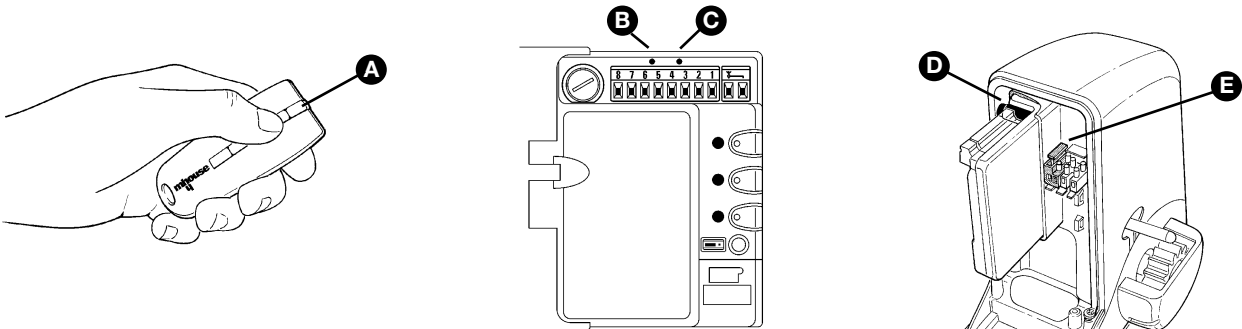


Figure 72

5.6 Diagnostics and Signals

A few devices issue special signals that allow you to recognize the operating status or possible malfunctions.

5.6.1 Photocells

The photocells are fitted with a “SAFE” LED **[A]** (Figure 73) which enables the user to check operating status at all times.

Table 10			
LED "SAFE"	MEANING	OUTPUT STATUS	ACTION
Always off	Signal OK = No obstacle	Active	All Ok
Slow flash	Low signal = No obstacle	Active	Improve centring
Quick flash	Very poor signal = No obstacle	Active	Check centring, cleanliness and environment
Always on	Signal zero = Obstacle present	Alarm	Remove obstacle

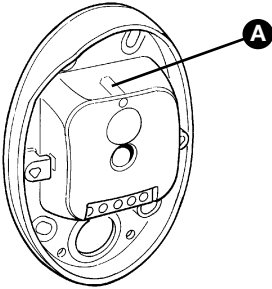


Figure 73

5.6.2 Flashing indicator

During the manoeuvre, the flashing indicator emits one flash every second; in the event of a malfunction, the flashing frequency is increased (one per half a second) and the flashes are repeated twice, separated by a pause of one second.

Table 11		
Quick flashes	Status	Action
2 flashes pause of one second 2 flashes	Activation of a photocell	At the start of the manoeuvre one or more photocells do not enable movement; check for the presence of obstacles. During movement, if an obstacle is present no action is required.
3 flashes pause of one second 3 flashes	Activation of “motor force” limiter	During movement, the gate is subject to increased friction; check cause.
4 flashes pause of one second 4 flashes	Activation of STOP input	At the start of the manoeuvre or during movement, the STOP input is activated; check cause.

5.6.3 Control unit

The control unit is equipped with a series of LEDs, each of which indicates a specific condition, both under normal operating conditions and in the event of a fault.

Table 12

LED OK [A]	Status	Action
Off	Fault	Ensure correct power supply; check that the fuses have not tripped; in this case check the cause of the fault and replace the fuse with an identical version.
On	Serious Fault	There is a serious fault; try to switch off the control unit for a few seconds; if the status persists there is a fault and the electronic board must be replaced.
One flash per second	All Ok	Normal control unit operating status
2 long flashes	There is a variation of the input status	This is normal when one of the inputs change: OPEN, STOP, activation of photocells or use of the radio transmitter.
Series of flashes separated by a pause	This is the same signal as that on the flashing light (See Table 11)	
LED STOP [B]	Status	Action
Off	Activation of STOP input	Check the devices connected to the STOP input
On	All Ok	STOP input active
One flash per second	No device has been learnt or error on learnt devices	There may be fault devices; check and if necessary repeat the self-learning procedure (see paragraph 3.5.1 "Learning the gate opening and closing positions").
LED P1 [C]	Status	Action
Off	All Ok	No memorisation in progress
On	Memorisation Mode 1	Normal during memorisation in Mode 1, lasting maximum 10s
Series of quick flashes, from 1 to 4	Memorisation Mode 2	Normal during memorisation in Mode 2, lasting maximum 10s
LED P2 [D]	Status	Action
Off	All Ok	"Low" speed selected
On	All Ok	"High" speed selected
1 flash per second	The learning phase has not been performed or there are errors in the memorised data	Repeat the position self-learning procedure (see paragraph 3.5.1 "Learning the gate opening and closing positions").
2 flashes per second	Device learning phase in progress	This indicates that the phase for searching connecting devices is in progress (lasting a maximum of a few seconds)
LED P3 [E]	Status	Action
Off	All Ok	Sequential mode
On	All Ok	Complete cycle mode
1 flash per second	The learning phase has not been performed or there are errors in the memorised data	Repeat the position self-learning procedure (see paragraph 3.5.1 "Learning the gate opening and closing positions").
2 flashes per second	Position learning phase in progress	

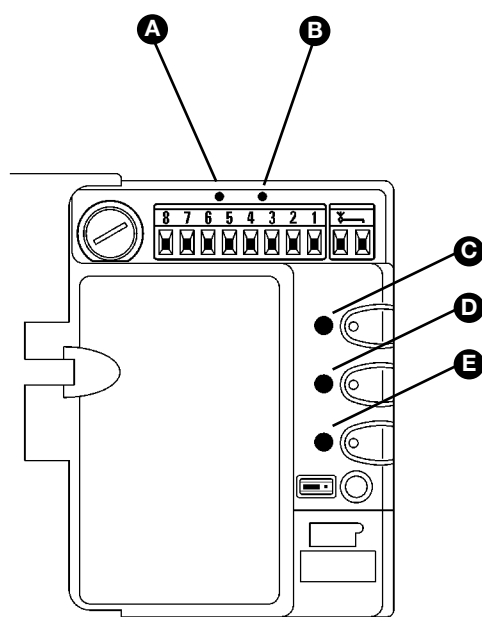


Figure 74

6 Technical specifications

SL0 is produced by NICE S.p.a. (TV) I, MHOUSE S.r.l. is a company in the group NICE S.p.a.

With the aim of improving products, NICE S.p.a. reserves the right to modify technical specifications at any time and without notice, while guaranteeing the original intended use and functions.

Note: all technical specifications refer to a temperature of 20°C.

SL0K gearmotor for sliding gates	
Type	Electromechanical gearmotor for automatic gate and door automations with built-in control unit complete with radio receiver for "TX4" transmitters.
Technology adopted	24Vdc motor, reducer gear with helical teeth, mechanical release. A transformer inside the motor but separate from the control unit reduces the mains voltage to the rated voltage of 24Vdc used in the entire automation system.
Maximum start-up torque	6 Nm
Rated torque	3,3 Nm
Rated thrust	110 N
Speed under no-load conditions	0.14 m/s at " low" speed; 0.26 m/s at "high" speed
Speed at rated torque	0,18 m/s
Maximum cycle frequency	50 complete cycles per day For a maximum of approx. 12 cycles per hour. At 50°C a maximum of 4 cycles per hour is admitted
Maximum time of continuous cycle	6 minutes
Limits of use	The structural characteristics make this unit suitable for the use on gates with a weight of up to 200 kg and leaf length of up to 5 m.
SL0 mains power supply	230Vac (+10% -15%) 50/60Hz
SL0/V1 mains power supply	120Vac (+10% -15%) 50/60Hz
Maximum power absorption	150 W
Emergency power supply	---
Flashing light output	For luminous indicators with 12V lamp, maximum 21W
Photo input	For safety devices with normally closed contact
"OPEN" input	For normally open contacts (closure of contact activates the "OPEN" command)
"STOP" input	For normally open contacts and/or 8,2K Ω constant resistance, or normally closed contacts with self-learning of the " normal" status (a variation with respect to the memorised status activates the "STOP" command)
Radio aerial input	52 Ω for cable type RG58 or similar
Maximum cable length	Mains power supply: 30m; inputs/outputs: 20m with aerial cable preferably less than 5m (observe specifications for minimum cable sections and type)
Operating environment temperature	-20 ÷ 50°C
Use in acid, saline or potentially explosive atmosphere	NO
Assembly	Horizontal on flat surface with specific fixing plate
Protection class	IP44
Dimensions/weight	300 x 163 h 295 mm / 9 Kg
Option for remote control	With TX4 transmitters, the control unit can receive one or more of the following commands: "OPEN", "Partial Open", "Open only" and "Close only"
Maximum TX4 transmitter memory	Up to 150 in memorisation mode 1
TX4 transmitter range	From 50 to 100m. This distance can vary in the presence of obstacles and possible electromagnetic disturbance, and is influenced by the position of the built-in aerial on the flashing light
Programmable functions	Sequential operation mode or Complete cycle mode (automatic closure) "Low" or "High" motor speeds Pause time in "complete cycle" selectable from 15, 30, and 60 seconds System object detection sensitivity selectable on 3 levels "OPEN" command operation selectable in 3 modes
Self-programmed functions	Auto-detection of type of "STOP" device (NO contact , NC contact or 8,2K Ω resistance) Auto-detection of length of gate and calculation of deceleration points.

PH0 Photocells	
Type	Presence detector for automatic gate and door automations (type D according to standard EN 12453) comprising a TX transmitter and RX receiver
Technology adopted	Optical, by direct TX-RX interpolation with modulated infrared rays.
Detection range	Opaque objects placed on the optical axis between TX-RX with dimensions greater than 50mm and speed less than 1.6m/s
TX transmission angle	approx. 20°
RX transmission angle	approx. 20°
Useful range	Up to 10m for maximum TX-RX offset of $\pm 5^\circ$ (the device may also signal an obstacle in the case of particularly adverse weather conditions)
Power supply/output	without 24 Vac/Vdc jumper, limits 18-35 Vdc, 15-28Vac with 12 Vac/Vdc jumper, limits 10-18 Vdc, 9 -15 Vac
Maximum absorption	25 mA RX, 30mA TX = 55 mA per pair
Maximum cable length	Up to 20m (observe specifications for minimum cable sections and type)
Operating environment temperature	-20 ÷ 50°C
Use in acid, saline or potentially explosive atmosphere	No
Assembly	Vertical, wall-mounted
Protection class	IP44
Dimensions / weight (TX and RX)	95 x 65 h 25mm / 65g

KS1 Key-Operated Selector Switch	
Type	Key-operated double switch suitable for control of automatic gates and doors. Illuminated for night operation
Adopted technology	Activation protected by a lock, the insertion and clockwise turning of the key causes the closing of a contact , the counter-clockwise turning of the key causes the closing of the second contact; spring-loaded for return of key to the middle position
Tamper-proof	The selector switch can be opened to access the connections only by inserting the key and turning it in either direction
Security lock	Key with 450 different key numbers
Power supply/contacts	The device can only be connected to the "OPEN" and "STOP" terminals on the MHOUSE automation control units, to which it sends the control signals and by which it is energized for night illumination
Operating ambient temperature	-20 ÷ 50°C
Suitable for use in acid, saline or potentially explosive atmosphere	No
Mounting	Vertical, wall mounted
Protection class	IP44
Dimensions / weight	95 x 65 h 36mm / 135g

FL1 Flashing light	
Type	Flashing signalling light for automatic gates and doors. The device incorporates a receiving aerial for remote control
Adopted technology	Visual signalling device with 12V 21W lamp, controlled by MHOUSE automation control units
Lamp	12V 21W BA15 socket (automotive type lamp)
Power supply	The device can be connected only to the "FLASH" and "AERIAL" terminals on the MHOUSE automatic gate control units
Operating ambient temperature	-20 ÷ 50°C
Suitable for use in acid, saline or potentially explosive atmosphere	No
Mounting	Horizontal surface-mounted or vertical wall-mounted
Protection class	IP44
Dimensions / weight	120 x 60 h 170mm / 285g

TX4 transmitters	
Type	Radio transmitters for remote control of automatic gates and doors
Adopted technology	AM OOK coded modulation of radio carrier
Frequency	433.92 Mhz
Coding	Rolling code with 64 Bit code (18 billion million combinations)
Buttons	4, each button can be used for the different controls of the same control unit or to control different control units.
Irradiated power	Approx. 0.0001W
Power supply	6V +20% -40% with two CR2016 type lithium batteries
Battery life	3 years, estimated on the basis of 10 commands/day, each lasting 1s at 20°C (at low temperatures the efficiency of the batteries decreases)
Operating ambient temperature	-20 ÷ 50°C
Suitable for use in acid, saline or potentially explosive atmosphere	No
Protection class	IP40 (suitable for use indoors or in protected environments)
Dimensions / weight	72 x 31 h 11mm / 18g

7 Annexes

The following annexes are designed to help you prepare the technical documentation

7.1 Annexe 1: CE Declaration of Conformity of SL0 Components

CE Declaration of Conformity of SL0 components; this statement must be attached to the technical documentation.

7.2 Annexe 2: CE Declaration of Conformity of Power Operated Gate

CE Declaration of Conformity to be filled in and delivered to the owner of the power operated gate.

7.3 Annexe 3: Operating Guide

Brief guide to be used as an example for drafting the operating guide to be delivered to the owner of the power operated gate.

Declaration of conformity

EC Declaration of Conformity according to the 98/37/EC, 73/23/EEC, 89/336/EEC and 1999/5/EC Directives
SLO is produced by NICE S.p.a. (TV) Italy; MHOUSE S.r.l. is a company of the Nice S.p.a. Group.

Number: 249/SLO

Revision: 0

The undersigned Lauro Buoro, managing director, declares under his sole responsibility that the following product:

Manufacturer's name: NICE s.p.a.

Address: Via Pezza Alta 13, 31046 Z.I. Rustignè, Oderzo (TV) Italy

Type: Electromechanical gearmotor with incorporated control unit and radio receiver

Model: SLO

Accessories: TX4, PH0, KS1, FL1

Satisfies the essential requirements of the following Directive:

Reference	Heading
98/37/EC (89/392/EEC amended)	DIRECTIVE 98/37/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL of June 22nd 1998 concerning the harmonisation of the legislations of member States regarding machines.
Following Enclosure II, part B (Manufacturer's EC Declaration of Conformity).	

As specified in the directive 98/37/EEC, the use of the product specified above is not admitted until the machine on which it is mounted has been identified and declared as conforming to the 98/37/EEC directive.

The product complies with the specifications of the following EC directives, as amended by the 93/68/EEC directive of the European Council of July 22nd 1993:

Reference	Heading
73/23/ EEC	DIRECTIVE 73/23/EEC OF THE COUNCIL of February 19th 1973 for the harmonisation of the legislations of member States regarding electrical equipment designed to be used within certain voltage limits.
In accordance with the following harmonised standards: EN 60335-1:1994; EN 50366:2003, EN 60950-1:2001 (for the applicable sections)	
89/336/EEC	DIRECTIVE 89/336/EEC OF THE COUNCIL of 3rd May 1989, for the harmonisation of the legislations of member States regarding electromagnetic compatibility.
In accordance with the following harmonised standards: EN 61000-6-2:2001; EN 61000-6-3:2001+A1:2004	

Furthermore, the product complies to the essential requirements requested by article 3 of the following European directives for the use to which the product is destined:

Reference	Heading
1999/5/EC	DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL of 9th March 1999 regarding radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.
In accordance with the following standards: EN 300220-3 V1.1.1:2000, EN 301 489-1:2004; EN 301 489-3:2002	

It also conforms to the applicable sections of the following standard:

EN 60335-1:2002+A1:2004+A11:2004, EN 60335-2-103:2003, EN 13241-1:2003; EN 12453:2002; EN 12445:2002; EN 12978:2003

Oderzo, 30th May 2006

Lauro Buoro
(Managing Director)



Declaration of conformity

Secondo la direttiva 98/37/CE ALLEGATO II parte A (dichiarazione CE di conformità per le macchine)

The undersigned / Company:

(name or business name of person who has put the power operated gate into service)

(address)

Declares under his/her sole responsibility that:

The automation : **power operated gate**

Serial number : _____

Year of manufacture : _____

Location (address) : _____

Satisfies the essential requirements of the following Directives:

98/37/EC	Machine Directive
89/336/EEC	Electromagnetic Compatibility Directive
73/23/EEC	Low Voltage Directive
99/5/EC	"R&TTE" Directive

And the provisions of the following harmonised standards:

EN 12445	"Industrial, commercial and garage doors and gates. Safety in use of power operated doors - Test methods"
EN 12453	"Industrial, commercial and garage doors and gates. Safety in use of power operated doors - Requirements"

Name _____ **Signature** _____

Date _____ **Location** _____

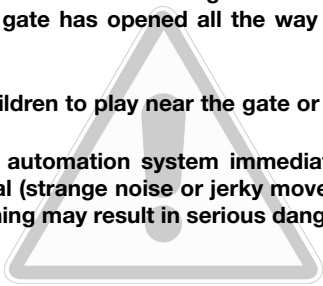


7.3 Annexe 3: Operating Guide

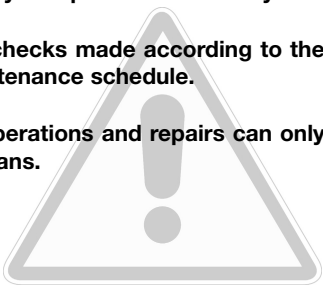
This guide should be stored in an accessible location and made available to all users of the automation.

7.3.1 Safety regulations

- **Keep at a safe distance while the gate is moving; do not pass through until the gate has opened all the way and has stopped moving.**
- **Do not allow children to play near the gate or with its controls.**
- **Stop using the automation system immediately if you notice anything abnormal (strange noise or jerky movements); failure to observe this warning may result in serious danger and accidents.**



- **Do not touch any components while they are moving.**
- **Have periodic checks made according to the instructions provided in the maintenance schedule.**
- **Maintenance operations and repairs can only be performed by qualified technicians.**



7.3.2 Gate Control

With radio transmitter

The radio transmitter is ready for use and the four buttons have the following functions:

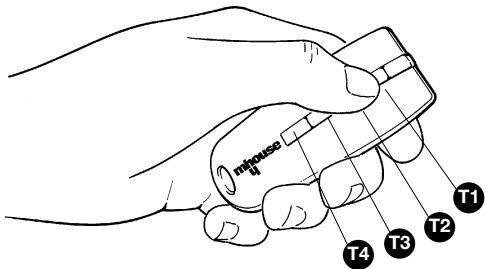


Figure 75

Function(*)	
T1 button	
T2 button	
T3 button	
T4 button	

(*) This table must be prepared by the person who has programmed the system:

With selector switch

The selector switch has two positions, with automatic return to the centre.

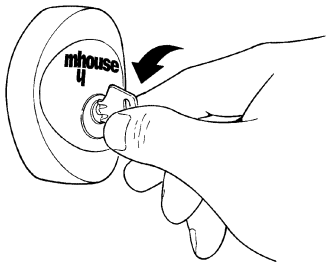


Figure 76

Action	Function(*)
Rotated to the right: "OPEN"	(*)
Rotated to the left: "STOP"	Arresta il movimento del cancello

(*) This item must be drafted by the person who has programmed the system.

Control with safety devices out of order

If the safety devices are out of order or malfunctioning, it is still possible to control the gate.

- 1** Operate the gate control device (remote control or key-operated selector switch). If the safety devices enable the operation, the gate will open normally, otherwise:
- 2** The flashing light flashes a few times but the manoeuvre does not start (the number of flashes depends on the reason why the manoeuvre is not enabled).
- 3** In this case, actuate the control again within 3 seconds and keep it actuated.
- 4** After approximately 2s the gate will start moving in the "man present" mode, i.e. so long as the control is maintained the gate will keep moving; as soon as the control is released the gate will stop.

If the safety devices are out of order the automation must be repaired as soon as possible.

Gearmotor release

The gearmotor is equipped with a mechanical system which allows the gate to be opened and closed manually (i.e. as if SLO were not present).

The manual operation must be resorted to in case of power failures or system malfunctions.

If there is a malfunction of the gearmotor it is still possible to try and release the motor in order to check whether the problem is connected with the release mechanism.

1 Turn the release mechanism cover anti-clockwise until the hole matches the release pin.

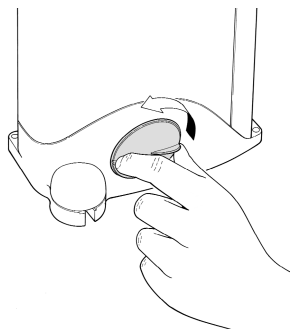


Figure 77

2 Insert the key in the pin.

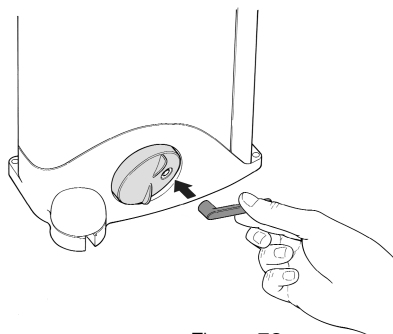


Figure 78

3 Turn the key anti-clockwise by approx. 90° until you feel the gate release

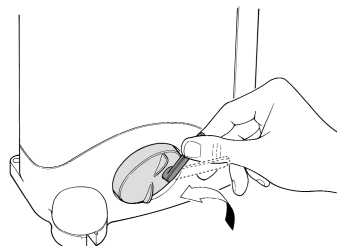


Figure 79

4 At this point, the gate can be moved manually.

5 To restore the functionality of the automation system, rotate the key clockwise while simultaneously moving the gate until it is caught by the mechanism.

6 Remove the key and close the cover by turning it clockwise.

7.3.3 Maintenance Operations to Be Performed by the User

The only maintenance operations that the user can and must perform periodically concern the cleaning of the photocell glasses and the removal of leaves and debris that may impede the automation.

• **Use a slightly damp cloth (not wet) to clean the surface of the devices. Do not use any substances containing alcohol, benzene, diluents or other flammable substances. The use of these sub-**

stances could damage the devices, start fires or generate electric shocks.

• **Disconnect the power supply to the automation before you proceed to remove leaves and debris, to prevent anyone from activating the gate.**

7.3.4 Replacing the Remote Control Battery

If the range of the remote control is significantly diminished and the light emitted by the LED is feeble, the remote control battery is probably exhausted. The remote control houses two CR2016 type lithium batteries. To replace them proceed as follows:

1 Open the bottom by pulling it.

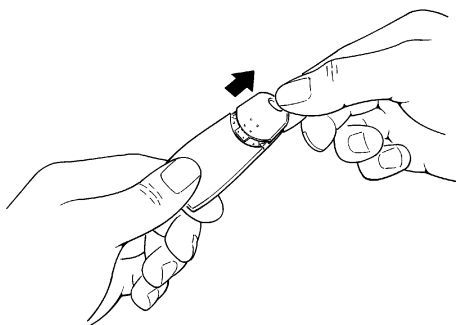


Figure 80

2 Insert a small pointed tool in the slit and prise the batteries out.

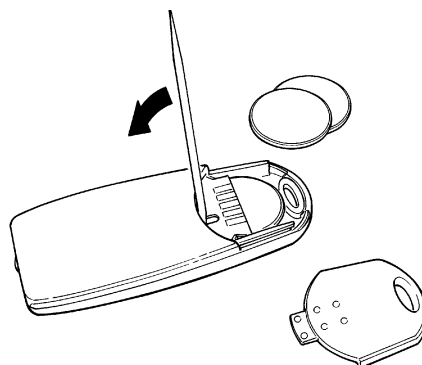


Figure 81

3 Insert the new battery, observing the polarity (the "+" symbol towards the bottom).

4 Close the bottom until it clicks.

The batteries contain polluting substances: do not dispose of them together with other waste but use the methods established by local regulations.

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