



*Sliding gate opener*



# LN4

## Installation and use instructions and warnings

CE

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**MirroW**

**moovo**

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## STEP 1

### WORKING IN SAFETY!

**⚠ Warning – for personal safety it is important to observe these instructions.**

**⚠ Warning – Important safety instructions: Keep these instructions in a safe place.**

The design and manufacture of the devices making up the product and the information in this manual fully comply with current standards governing safety. However, incorrect installation or programming may cause serious physical injury to those working on or using the system. For this reason, during installation, always strictly observe all instructions in this manual.

If in any doubt regarding installation, do not proceed and contact the Moovo Technical Assistance for clarifications.

If this is the first time you are setting up an automation for sliding gates, we recommend that you read this entire manual with care. This is preferable before any work, without any hurry to start practical tasks.

Also keep product devices on hand while consulting the manual to enable testing and checking (excluding any programming phases) with the information provided in the manual.

While reading this manual, take care to observe all instructions marked with the following symbol:



These symbols indicate subjects that may be the source of potential hazards and therefore the prescribed operations **must be performed exclusively by qualified and skilled personnel**, in observance of these instructions current safety standards.

### ⚠ INSTALLATION WARNINGS

According to the most recent legislation, the installation of an automatic gate or door **must be in full observance of the standards envisaged by European Directive 98/37/EC (Machinery Directive)** and in particular standards EN 12445, EN 12453 EN 12635 and EN 13241-1, which enable declaration of presumed conformity of the automation.

**In consideration of the above,**

The final connection of the automation to the electrical mains, system testing, commissioning and periodic maintenance **must be performed by skilled and qualified personnel**, in observance of the instructions in the section *“Tasks reserved for qualified technicians”*. These personnel are also responsible for the tests required according to the risks present, and for ensuring observance of all legal provisions, standards and regulations: and in particular all requirements of the standard EN 12445, which establishes the test methods for checking automations for gates.

However, all preliminary set-up, installation and programming operations may be performed by personnel with standard skills, provided that all instructions and the relative sequences in this manual are strictly observed, with special reference to the warnings in STEP 1

**Before starting installation, perform the following checks and assessments:**

– ensure that each device used to set up the automation is suited to the intended system. For this purpose, pay special attention to the data provided in the paragraph *“Technical specifications”*. Do not proceed with installation if any one of these devices does not correspond to specifications.

– ensure that the devices in the kit are sufficient to guarantee system safety and functionality.

– an assessment of the associated risks must be made, including a list of the essential safety requirements as envisaged in *Appendix I of the Machinery Directive*, specifying the relative solutions adopted. Note that the risk assessment is one of the documents included in the automation Technical documentation. This must be compiled by a professional installer.

Considering the risk situations that may arise during installation phases and use of the product, the automation must be installed in observance of the following warnings:

– never make any modifications to part of the automation other than those specified in this manual. Operations of this type will lead to malfunctions. The manufacturer declines all liability for damage caused by makeshift modifications to the product.

– ensure that parts of the automation cannot come into contact with water or other liquids. During installation ensure that no liquids penetrate the gearmotors or other devices present.

– Should this occur, disconnect the power supply immediately and contact a Moovo service centre. Use of the automation in these conditions constitutes a hazard.

– never place automation components near to sources of heat and never expose to naked flames. This may damage system components and cause malfunctions, fire or hazardous situations.

– all operations requiring opening of the protection housings of various automation components must be performed with the control unit disconnected from the power supply. If the disconnect device is not in a visible location, affix a notice stating: **“WARNING! MAINTENANCE IN PROGRESS”**.

– the product may not be considered an efficient system of protection against intrusion. If an efficient protection system is required, the automation must be integrated with other devices.

– Connect the control unit to an electric power line equipped with an earthing system.

– the product may only be used after completing the automation **“commissioning”** procedure as specified in paragraph **“Automation testing and commissioning”** provided in the section *“Tasks reserved for qualified technicians”*.

– The automation component packaging material must be disposed of in full observance of current local legislation governing waste disposal.

**STEP 2**

**2.1 – PRODUCT DESCRIPTION AND INTENDED USE**

In general, the series of devices that make up this product serve to automate a sliding gate for residential applications (fig. 1).

**Any other use than as specified herein or in environmental conditions other than as stated in STEP 3 is to be considered improper and is strictly prohibited!**

The gearmotor comprises a 12 V dc motor, a pinion and a control unit.

The control unit powers all devices present in the system and manages all relative functions. It is made up of a board and incorporated radio receiver which receives the commands sent by a transmitter. It may also be controlled via a wall-mounted keypad or a pair of photocells set with the single opening command.

The control unit can control different types of manoeuvres, each programmable and usable according to specific requirements.

Special functions are also available to enable personalisation of automation use.

The automation enables the installation of various accessories which enhance functionality and guarantee optimal safety. In particular, the control unit can memorise up to 150 keys of MT4 transmitters; up to 4 MK control keypads or alternatively up to 4 pairs of MP photocells, set for the opening command only.

Connections of the various devices are by means of a “Bus” cable. This reduces complexity of the connection, as the “Bus” envisages the use of a single cable between one device and another.

The product is mains-powered, and, in the event of a power failure enables manual release of the gearmotor for manual movement of the gate leaves.

In this situation, the gate can also be opened using the buffer battery (MB model) if fitted on the system.

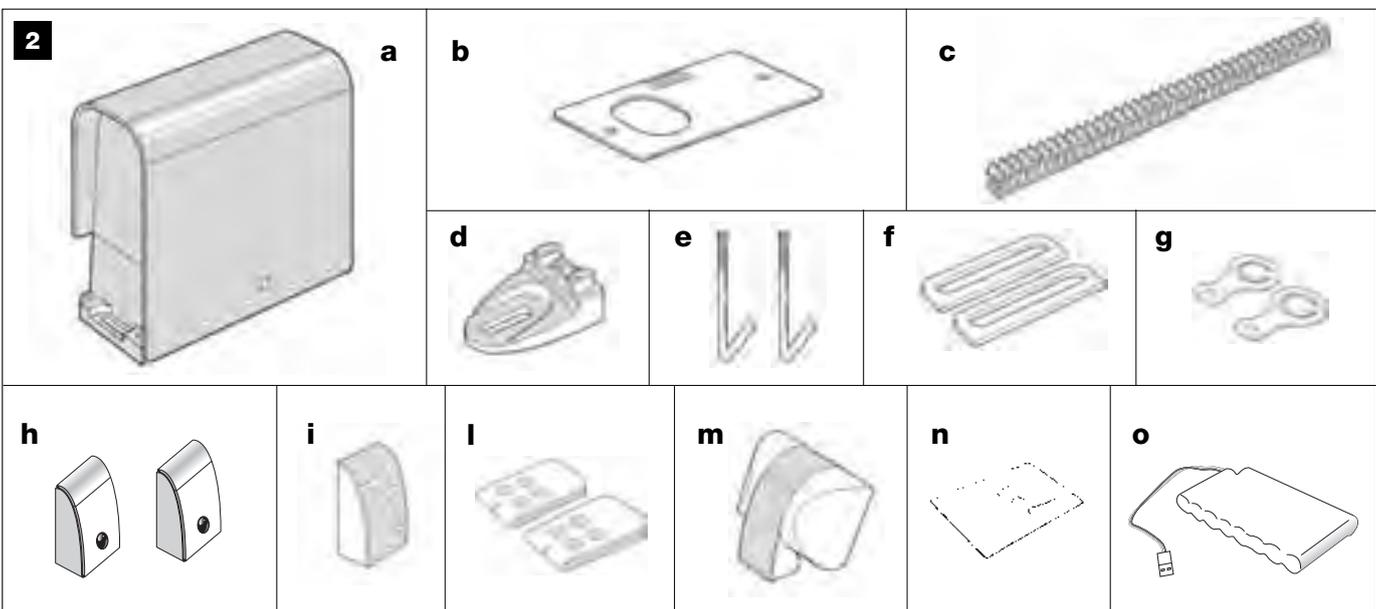
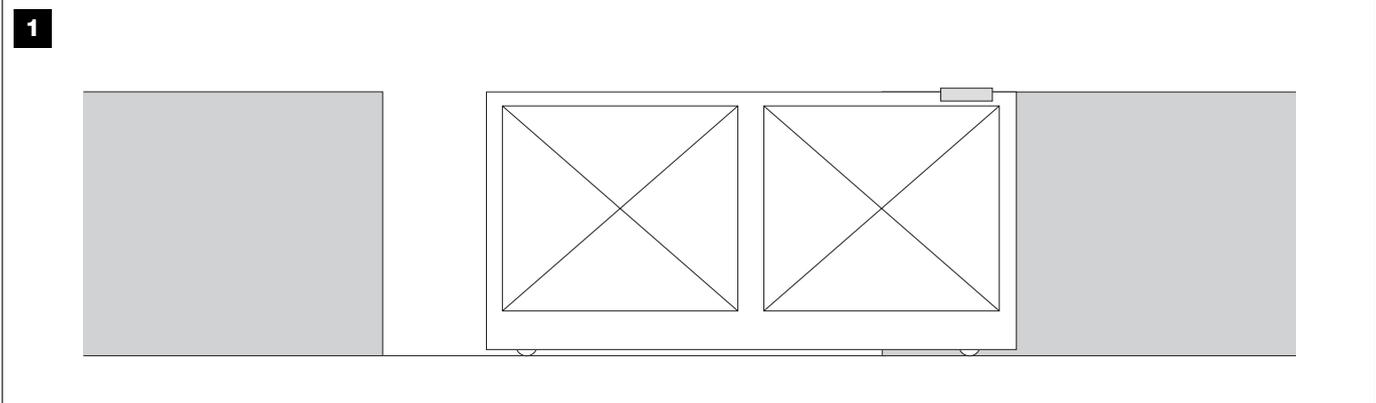
**2.2 – COMPONENTS USED TO SET UP A COMPLETE SYSTEM**

fig. 2 illustrates all components used to set up a complete system, such as that shown in fig. 5.

**WARNING!**  
Some components shown in fig. 2 are optional and may not be supplied in the pack.

**List of components:**

- [a] - electromechanical gearmotor
- [b] - foundation plate
- [c] - rack
- [d] - rack fixing brackets
- [e] - anchor bolts
- [f] - reinforcement plates
- [g] - keys for manual release of gearmotor
- [h] - pair of photocells mod. MP (wall-mounted)
- [i] - control keypad mod. MK (wall-mounted)
- [l] - portable transmitter mod. MT4
- [m]- flashing light mod. MF
- [n] - metal hardware (screws, washers, etc.)
- [o] - buffer battery mod. MB



**STEP 3****PRELIMINARY INSTALLATION WORK**

Before proceeding with installation, check the condition of the product components, suitability of the selected model and conditions of the intended installation environment.

**IMPORTANT** – The gearmotor cannot be used to power a manual gate that does not have a fully efficient and safe mechanical structure. Neither can it solve defects caused by poor installation or insufficient maintenance of the door itself.

**3.1 – CHECKING SUITABILITY OF THE ENVIRONMENT AND THE GATE TO BE AUTOMATED**

- Ensure that the mechanical structure of the gate complies with current national standards and that it is suitable for automation. (If present, refer to the information specified on the gate dataplate).
- Move the gate leaf manually to *open* and *close*, checking that movement has the same degree of friction throughout all points of travel (no increase in friction must occur).
- Manually move the leaves to any position and leave stationary, ensuring that they do not move from this position.
- Ensure that the space around the gearmotor enables safe and easy manual gate release. (see chapter “**Manually releasing or locking the gearmotor**” in the “Operation manual”).
- Ensure that the selected surfaces for installation of the various devices are solid and guarantee a stable fixture.
- Ensure that all devices to be installed are in a sheltered location and protected against the risk of accidental impact.
- Ensure that the selected surfaces for fixing the photocells are flat and enable correct alignment between photocells.

**3.2 – CHECKING PRODUCT APPLICATION LIMITS**

To ascertain suitability of the product with respect to the specific features of the gate and area to be automated, the following checks should be performed as well as a check for compliance of the technical data in this paragraph and the chapter “**Product technical specifications**”.

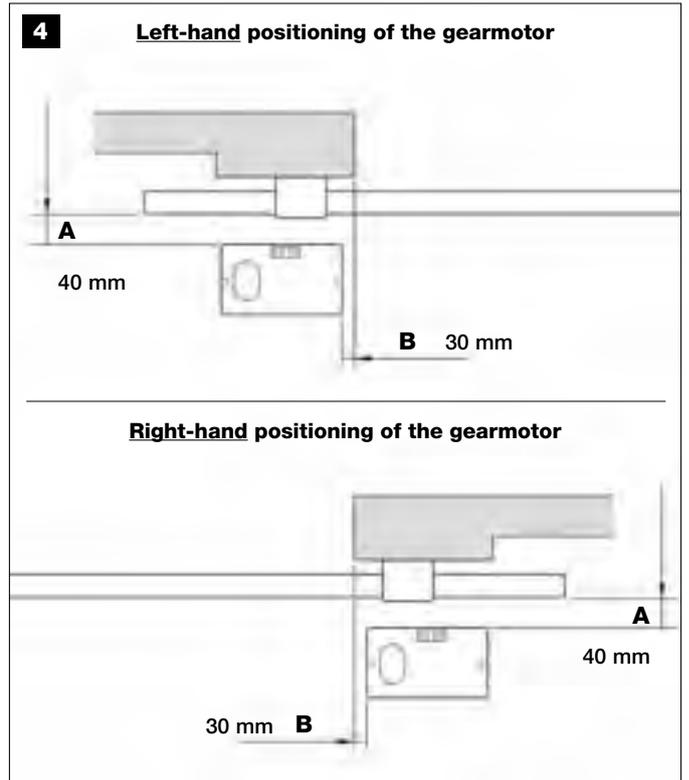
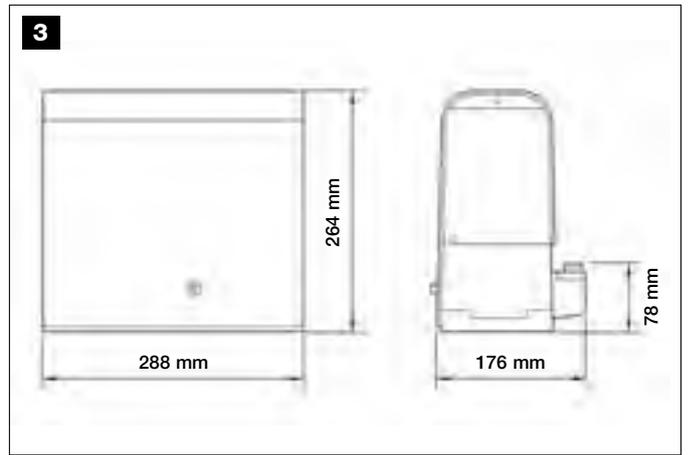
**IMPORTANT** – For the checks below, refer also to **fig. 3** and **4**:

- **Fig. 3**: indicates the overall dimensions of the gearmotor.
- **Fig. 4**: indicates values **A** and **B**, i.e. the minimum and maximum measurements to observe when locating the position for the foundation plate. **Note** – These measurements also serve as a reference to calculate the space occupied by the foundation pit for routing the electrical cable ducting.
- Ensure that the dimensions and weight of the gate are within the following limits of use.
  - maximum length 5 m (\*);
  - maximum weight 300 kg.

(\* **Note** – The e rack supplied with this product is suitable for automation of a gate with leaves of a maximum length of 4 m. If necessary, this may be extended to a maximum length of 5 m using rack mod. MR1 (2 sections of 50 cm).

- Ensure that the dimensions of the selected area for mounting the gearmotor is compatible with the overall dimensions.
- On the gate leaf, ensure that the surface for mounting the rack is suitable and solid.

**CAUTION!** – If the results of these checks do not conform to specifications, this model cannot be used for automation of your gate.



## STEP 4

### 4.1 – PRELIMINARY SET-UP WORK

#### 4.1.1 – Typical reference system

Fig. 5, shows an example of an automation system set up with Moovo components. These parts are positioned according to a typical standard layout. The following components are used:

- a - Electromechanical gearmotor
- b - Rack
- c - Pair of photocells (wall-mounted)
- d - Flashing light
- e - Control keypad (wall-mounted)
- f - Pair of photocells (on posts)

#### 4.1.2 – Establishing positions of components

With reference to fig. 5, locate the approximate position for installation of each component envisaged in the system. In particular, to establish the position of the flashing light, refer also to fig. 20.

**Warning** – The “fixed” control devices must be visible from the gate but positioned far from moving parts.

#### 4.1.3 – Establishing the positions of the gearmotor

The gearmotor is factory set to be installed on the right-hand side of the gate.

**CAUTION!** - If forced to install the gearmotor on the left-hand side of the gate, refer to the instructions in STEP 6.1.

#### 4.1.4 – Establishing the device connection layout

The product envisages a “Bus” type connection between all system devices, using a single cable with two electrical wires. In this type of connection, data communication between devices is via cable, using the specific protocol named “Bus-Moovo”.

**CAUTION!** – on the Bus system, only devices compatible with this protocol may be installed in the system.

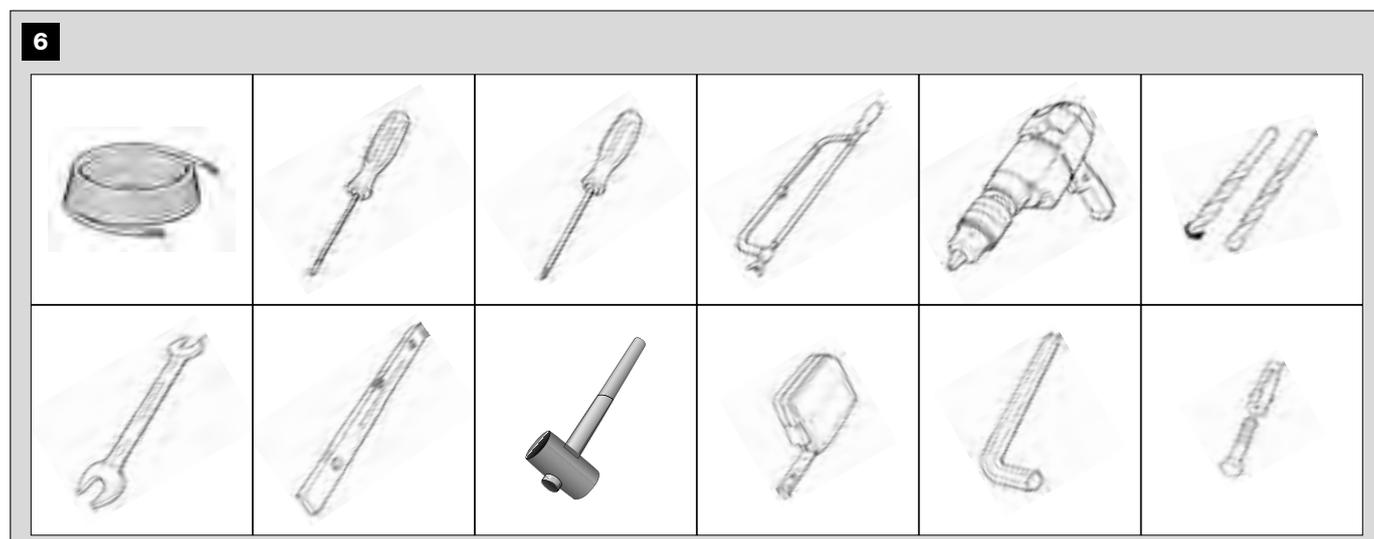
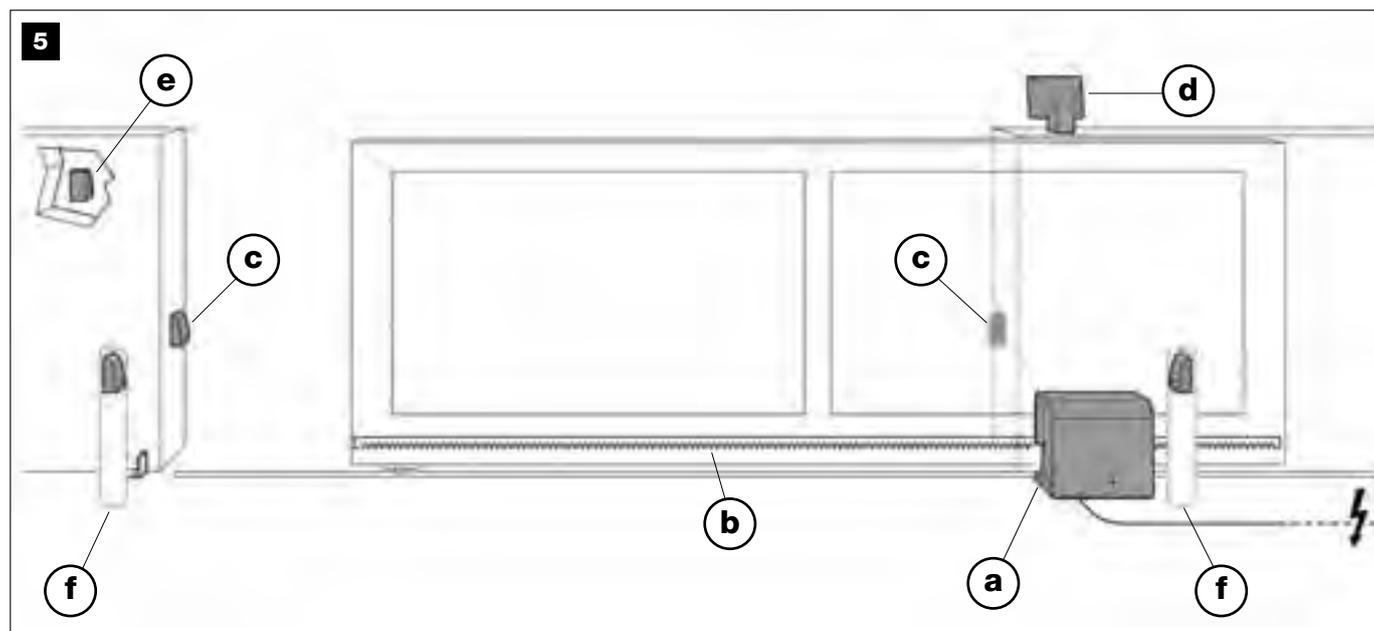
On a “Bus” network, devices can be connected using various connection configurations, and in each one, each device becomes a node of this network. The possible connection layouts are the following:

– “star”: In this configuration, each device is autonomous as it is connected directly to the two Bus terminals on the control unit.

– “chain”: In this configuration one device is connected to another and the latter to another and so on, like links of a chain. Therefore only the first device in the chain is connected to the two Bus terminals on the control unit.

– “mixed”: this configuration is a combination of the two configurations described above.

To select the most suitable connection configuration for the connection of all system devices, refer to the example shown in fig. 7 / fig. 17. In general, it is recommended to connect the flashing light as the first device connected to the control unit.



**4.1.5 – Checking the tools required for work**

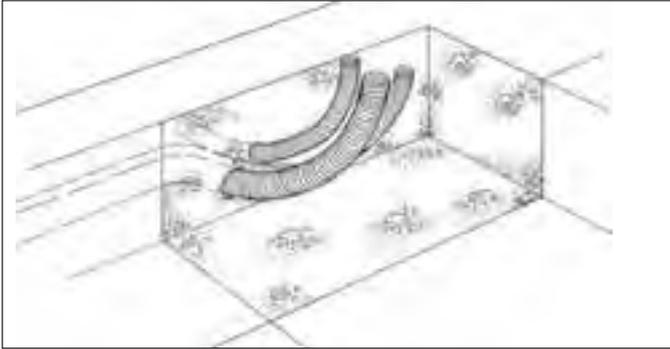
Before starting installation, ensure that there is all equipment and materials required for the work concerned (see example in **fig. 6**); also ensure that all items are in good condition and comply with local safety standards.

**4.1.6 – Preliminary set-up work**

Dig the routes for the ducting used for electrical cables, or alternatively external ducting can be laid, after which the pipelines can be embedded in concrete and other preparation work for the installation can be completed to finalise the site ready for subsequent installation operations.

In particular, for digging the pit for anchoring the gearmotor to the ground, proceed as follows:

- 01. Dig the foundation pit in the gearmotor fixture point: refer to **STEP 3.2**.  
**Note** – The dimensions of the pit must be the same or greater than those of the foundation plate.



- 02. Lay the ducting used for electrical cables as shown in the figure below.

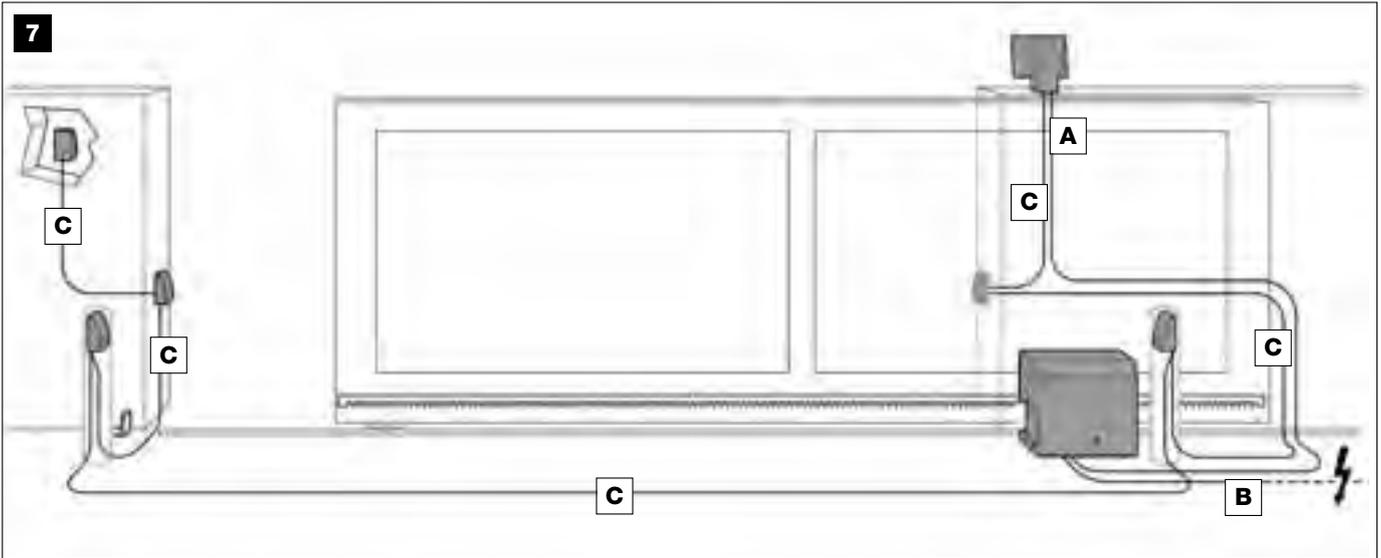
**CAUTION!** – In general, position the ends of the ducting used for electrical cables in the vicinity of the points envisaged for fixture of the various components.

**Note:** The ducting serves to protect electrical cables and prevent accidental damage in the event of impact.

**4.2 – PREPARING THE ELECTRICAL CABLES**

When preparing the electrical cables required for your system, please refer to **fig. 7** and “**Table 1 – Technical characteristics of the electric cables**”. In addition to this, you should always remember the following:

- In the “star” configuration, **NONE** of the individual cables linking up any of the devices to the Control Unit may exceed 20 m in length.
- In the “chain” configuration”, the sum of the lengths of each cable used to connect one device to the other and, last of all, to the Control Unit **MUST NOT exceed 20 m**.
- If connecting other devices between the Control Unit and the flashing lamp, use the same cable for these devices as was used for the flashing lamp.
- All operations to lay the electric cables and connect them to the various devices must be carried out during installation of the components.



**TABLE 1 – Technical specifications of electric cables (see also paragraph 4.2)**

Connection	Cable type	Maximum admissible len
<b>A</b> - FLASHING LIGHT cable	Cable 2 x 1.0 mm <sup>2</sup>	10 m (note 2)
<b>B</b> - POWER SUPPLY cable	Cable 3 x 1.5 mm <sup>2</sup> (note 1)	30 m
<b>D</b> - BUS cable	Cable 2 x 0.5 mm <sup>2</sup>	20 m (note 3)

**Note** – The cables required for the set-up of the system (not included in the pack) may vary according to the quantity and type of components envisaged for the system.

**Note 1** – If the power cable supplied is not long enough, replace with a cable of this type. This task must be performed by skilled and qualified personnel: Refer to the section “**Tasks reserved for qualified technicians**”.

**Note 2** – If a greater length is required use a cable with diameter 2 x 1.5 mm<sup>2</sup>.

**Note 3** – If a greater length is required use a cable with diameter 2 x 1.0 mm<sup>2</sup>.

**CAUTION!** – The cables used must be suited to the installation environment; for example a cable type H07RN-F for outdoor environments is recommended.

**STEP 5**

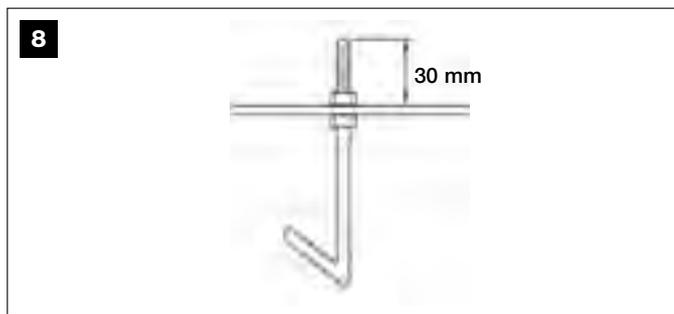
**INSTALLING THE AUTOMATION COMPONENTS**

**WARNINGS**

- *Incorrect installation may cause serious physical injury to those working on or using the system.*
- *Before starting automation assembly, make the preliminary checks as described in STEP 3.*

The following assembly phases illustrate the “physical” illustration of the gearmotor.

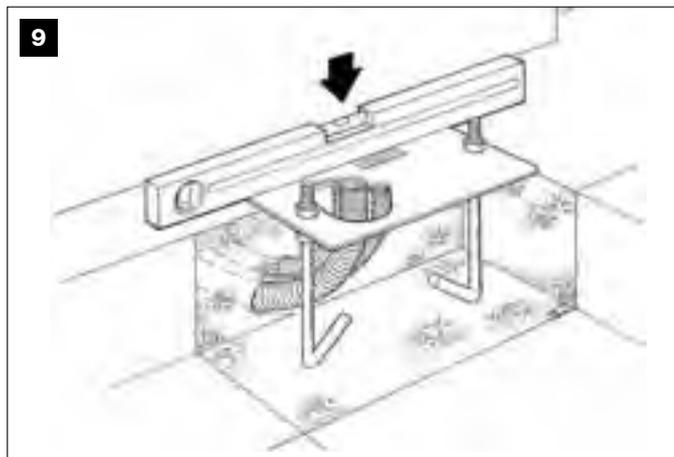
- 01.** After digging the pit for fixture of the gearmotor (see STEP 4.1.7), secure the anchor bolts to the plate as follows (fig. 8):
- a) Tighten a standard nut (NOT locknut) fully down on each anchor bolt.
  - b) Insert the anchor bolts so that the threaded section protrudes by 30 mm from the side of the plate bearing the pinion image.



- c) Then temporarily tighten a standard nut (NOT locknut) onto the ends of the anchor bolts. **Note** – *In the next steps, the two upper nuts will be removed and replaced with two locknuts.*

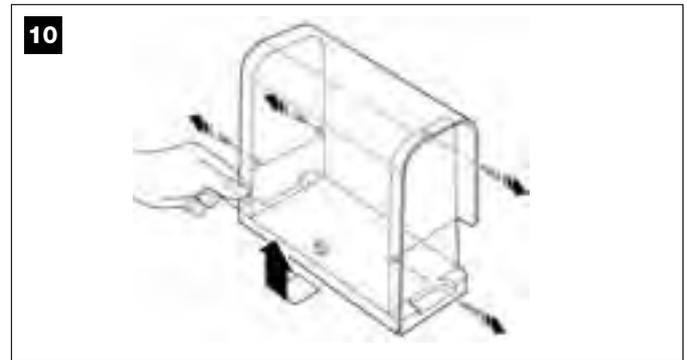
- 02.** Cast concrete into the pit, filling it to the edge and ensuring that the ducting tube for electric cables come out of the surface.

- 03.** While the concrete is still liquid, carefully place the foundation plate on top, immersing the anchor bolts in the mix: shake the plate to ensure that all air escapes from underneath and no bubbles form. Take care to observe the following warnings (fig. 9):
- the side of the plate bearing the image of the pinion must be facing the gate (see fig. 4);
  - the ducting tube for routing the electric cables must pass through the relative hole in the plate;
  - observe the distances specified in fig. 4 to correctly position the plate with respect to the gate leaf and wall.
  - ensure that the plate is parallel to the gate and perfectly level (use a spirit level).



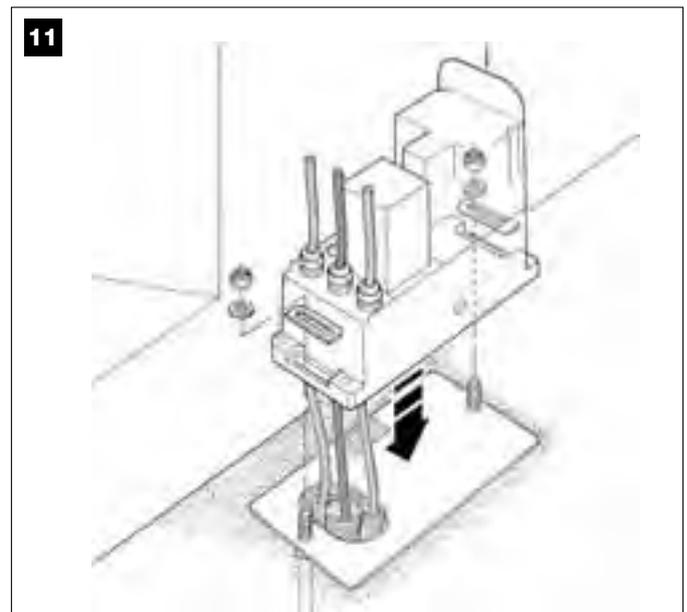
- 04.** When the concrete is solid (after a few days), loosen and remove the upper nuts of the plate, which are no longer required.

- 05.** Remove the gearmotor cover using a screwdriver to loosen the 4 lateral screws (fig. 10). **Note** – *Leave the gearmotor without the cover until the installation and programming phases have been completed*



**06. Fig. 11:**

- a) Pass the electric cables through the relative holes and cable clamps.
- b) Gently place the gearmotor on the protruding section of the anchor bolts so that they are inserted in the lateral holes of the gearmotor. Lock the assembly with the serrated washer and locknut. **Note** – *Do not tighten the nuts fully down, as the gearmotor must subsequently be moved forwards and backwards during rack assembly.*



**07. Assemble and secure the rack:**

To facilitate this operation, the rack assembly should be put together separately, including brackets, to then be mounted onto the gate leaf.

Assemble the rack:

- a) - establish the total length of the rack, which should be the same length as the gate leaf. Then calculate the number of parts required (sections of 50 cm) and if necessary cut one section to reach the total required length.
- b) - using a rubber mallet, join the two sections of the rack and insert a fixing bracket in the joining point. Then secure the bracket by means of a screw (fig. 12).
  - To improve fixture of the rack to the gate leaf, fix a bracket also at the centre of each section.
- c) - assemble the other parts of the rack (fig. 13) proceeding as described in point “b”. Lastly, fit a fixing bracket on each end of the rack: this must be positioned between the 6th and 8th tooth of the rack, starting from the end.

Fixing the rack to the gate leaf:

- d) - close the gate leaf completely.

e) - position one end of the rack above the gearmotor pinion, taking care to align the first fixing bracket with the centre of the pinion (fig. 14).

f) - using a spirit level, level the first section of the rack in the pinion area and temporarily secure to the gate leaf by means of adhesive tape.

Then repeat the same operations on the next section and so on through the entire length of the rack, taking care to position each section horizontally and perfectly aligned with the end placed on the pinion.

g) - Tighten the fixing brackets fully down on the gate leaf as follows (fig. 15): **first secure the two brackets in the vicinity of the gearmotor by means of screws and washers (with the gate completely closed). Then move the gate to bring the next bracket in alignment with the pinion and secure it to the leaf.**

Repeat the same operation for the next bracket and so on until all brackets on the rack are secured.

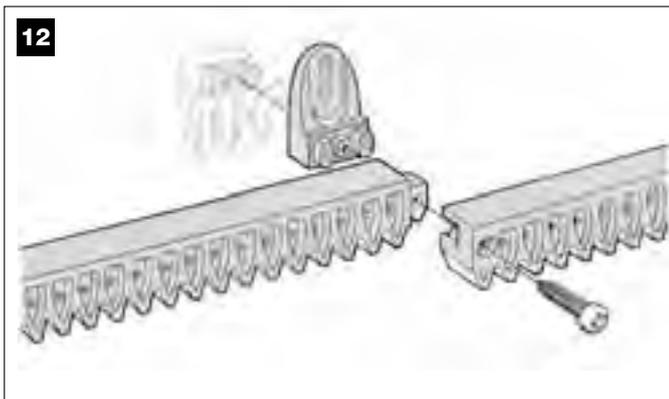
**Note** – The screws required to fix the rack on the gate leaf are not included in the pack as their type depends on the material and thickness of the leaf on which they are inserted.

h) - before securing the last section of the rack, completely open the gate and check that the bracket on the end is aligned with the centre of the pinion. If this is not so, move the bracket to this position and, if necessary, use a hacksaw to cut off the excess section of the rack, leaving a free section of approx. 5 cm. **IMPORTANT** - the rack must not protrude from the gate leaf.

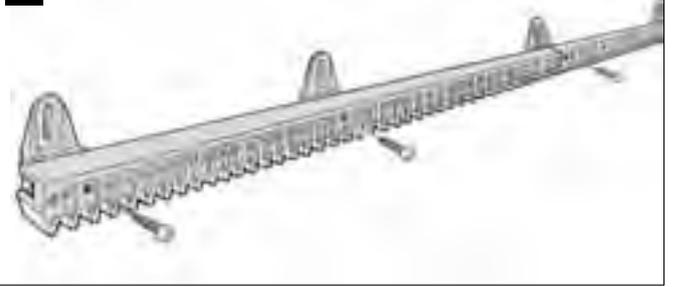
**Caution** – At the end of this work, check that the rack is perfectly level; the slots on the brackets enable corrections of small differences in alignment during fixture.

08. Then secure the gearmotor onto the foundation plate, tightening the two locknuts fully down: *the pinion must be perfectly aligned with the rack; if necessary slide the gearmotor forwards or backwards to adjust.*
09. Release the gearmotor by means of the special release key (see chapter “**Manually releasing or locking the gearmotor**” in the “Operation manual”) **and move the gate leaf to mid-travel.**
10. Make a number of complete manual gate *opening* and *closing* manoeuvres to enable self-adjustment of the mechanical limit switches. **Important** – During this manoeuvre, ensure that the rack slides in alignment with the pinion.
11. Then **move the gate leaf to mid-travel** and lock the gearmotor by means of the special key (see chapter “**Manually releasing or locking the gearmotor**” in the “Operation manual”).

**Note** – The 4 stud bolts supplied in the pack must be used exclusively to adjust the gearmotor height, when deciding to assembly the rack before the gearmotor (fig. 16).

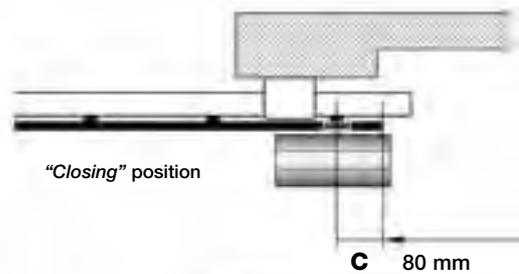


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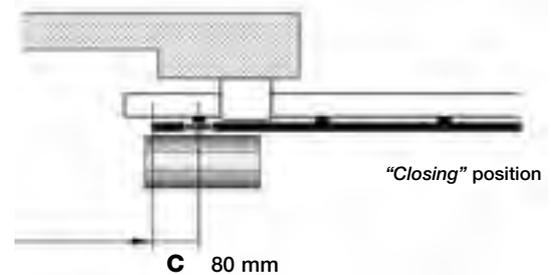


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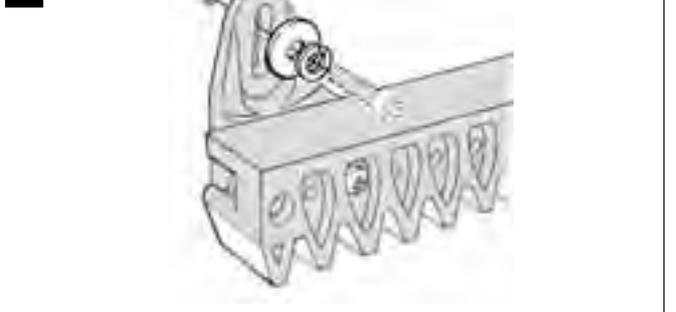
#### Right-hand positioning of the gearmotor



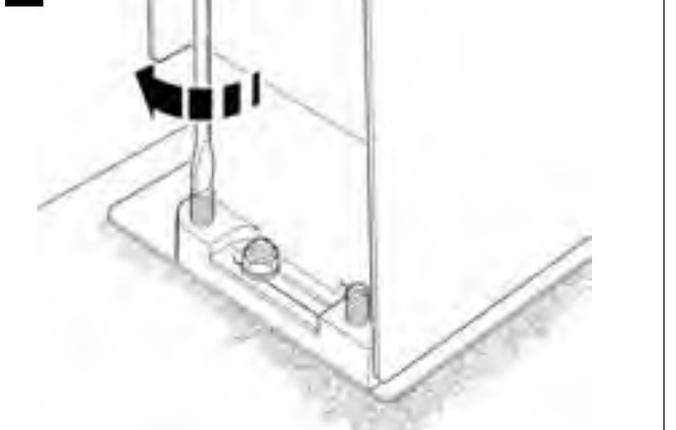
#### Left-hand positioning of the gearmotor



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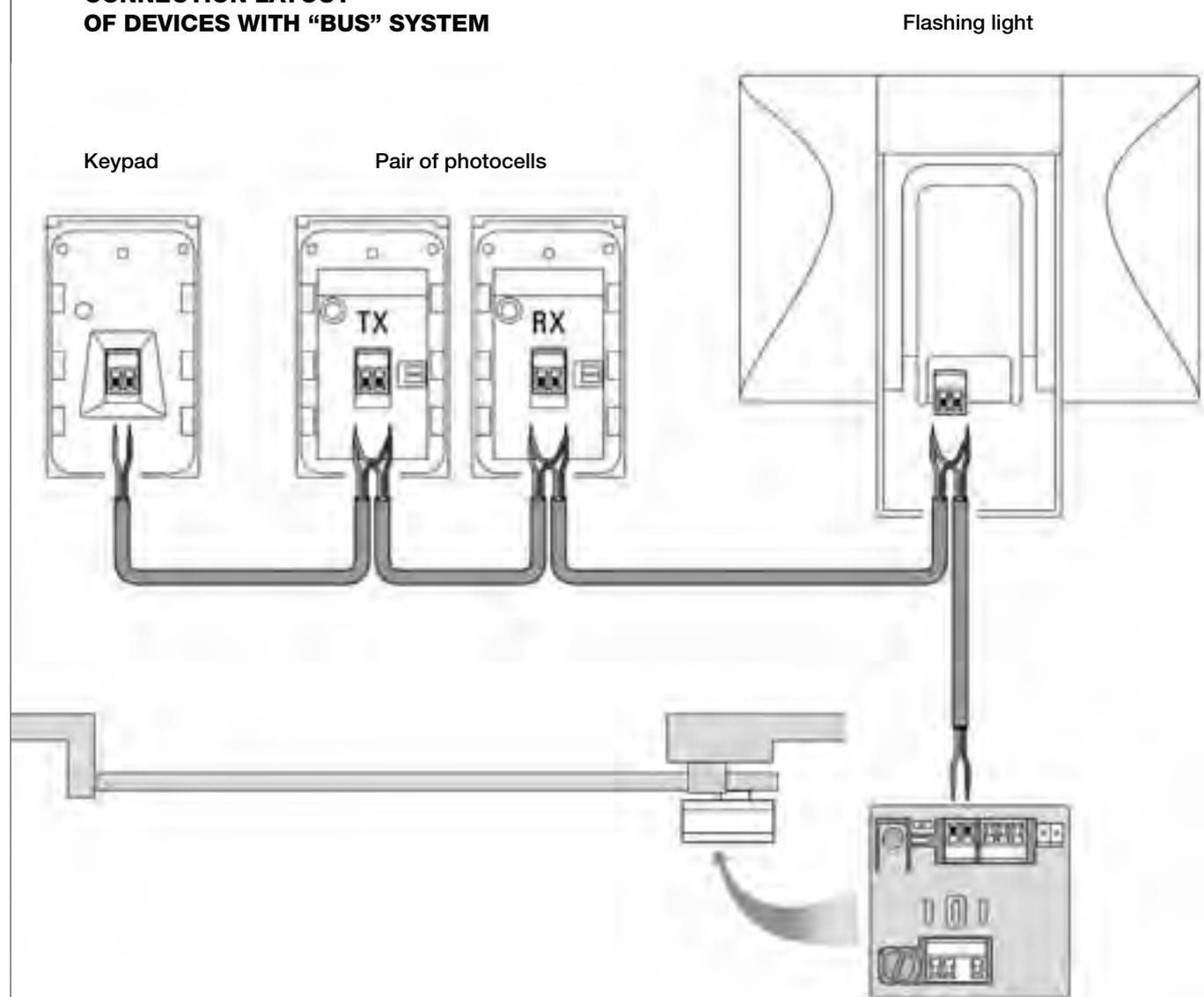
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**STEP 6****INSTALLATION AND CONNECTIONS OF SYSTEM DEVICES**

Install and connect the system devices with reference to the STEPS below and the example in **fig. 17**.

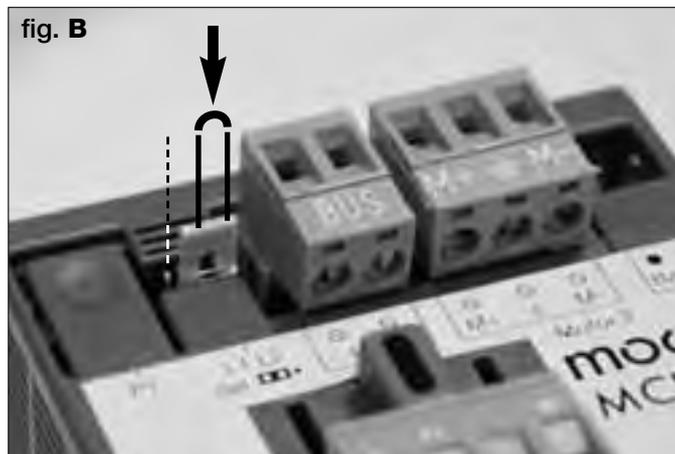
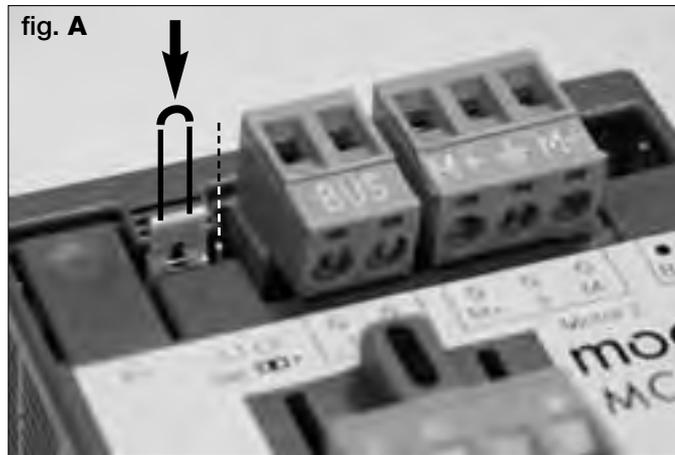
**CAUTION!** – Incorrect connections can cause faults or hazards; therefore ensure that the specified connections are strictly observed.

**17****CONNECTION LAYOUT  
OF DEVICES WITH “BUS” SYSTEM**

## 6.1 – SELECTION OF THE GEARMOTOR POSITION WITH RESPECT TO THE GATE, ON THE CONTROL UNIT

The gearmotor is factory set to be installed on the right-hand side of the gate: this setting is made by the position of the electric jumper “Sel” on the control unit as shown in **fig. A**.

Otherwise, if installing the gearmotor on the left-hand leaf, move the electric jumper “Sel” to the position shown in **fig. B**.



## 6.2 – INSTALLING AND CONNECTING FLASHING LIGHT mod. MF

This flashing device indicates execution of each manoeuvre. It is also connected to the diagnostics system of the control unit and in the event of malfunctions signals the type of problem by means of a pre-set sequence of flashes (see paragraph “What to do if...”).

To install and connect the flashing light proceed as follows:

### 01. Fig. 17:

Extract one of the two transparent covers, turning it anti-clockwise and set aside.



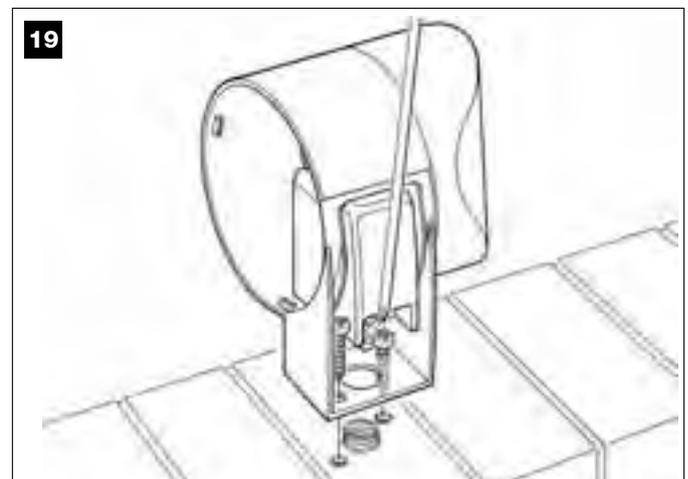
### 02. Fig. 18:

Use two fingers and at the same time press the two tabs at the bottom and use the other hand to remove the external cap of the flashing light.

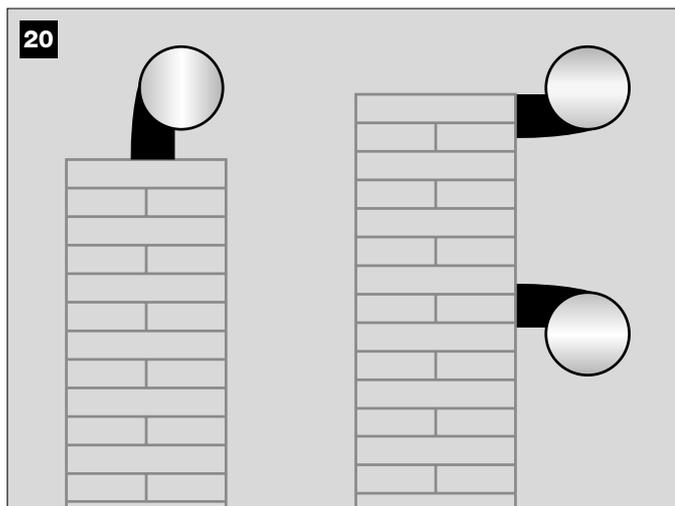


### 03. Fig. 19:

Drill the marked sections on the base of the flashing light for fixture of the screws and routing of the cables.

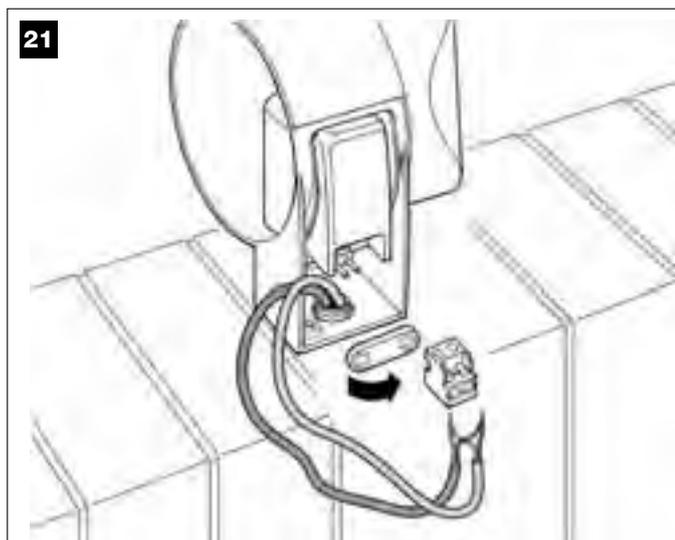


- 04. Fig. 20:**  
**CAUTION!** - Do not mount the product in positions other than those specified.

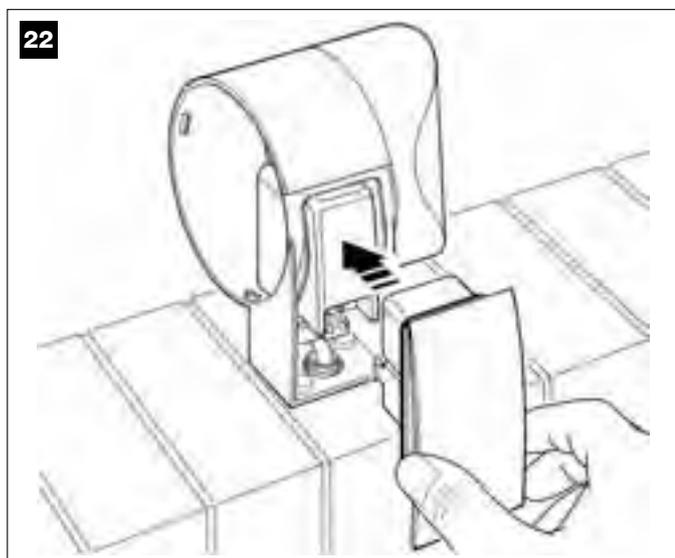


- 05.** Fix the body of the flashing light to the wall with the relative screws, routing the cables through the prepared hole.

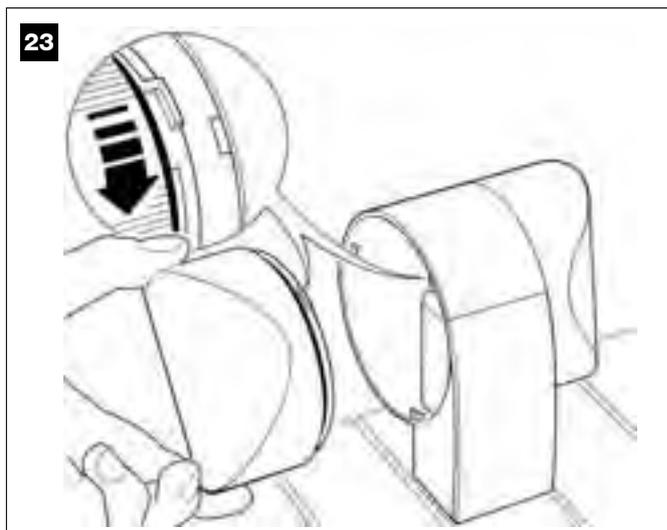
- 06. Fig. 21:**  
 a) Connect the wires of the two cables and secure on the terminal board  
 b) Lock the cable by means of the relative cable clamp.



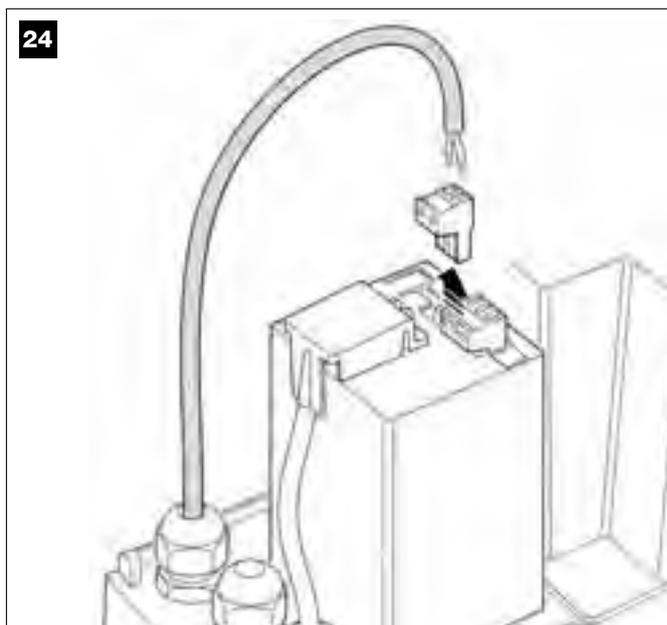
- 07. Fig. 22:**  
 Insert the cap of the flashing unit in its seat until the tabs click in place.



- 08. Fig. 23:**  
 Refit the transparent cover in its seat and turn clockwise, taking care that the serrated section engages with those on the flashing light body.



- 09. Fig. 24:**  
 a) On the gearmotor control unit, remove the BUS connection terminal board from its seat to enable loosening of the 2 terminal screws.  
 b) Proceed with connection of the cable wires, observing the symbols on the terminal board and refit the latter in its seat.  
 c) Then tighten the cable clamp to secure the cable to the gearmotor.



### 6.3 – INSTALLING AND CONNECTING PHOTOCELLS mod. MP

A pair of photocells comprises a transmitting element (TX) and a receiving element (RX). The photocells TX and RX are marked by a label inside the cover.

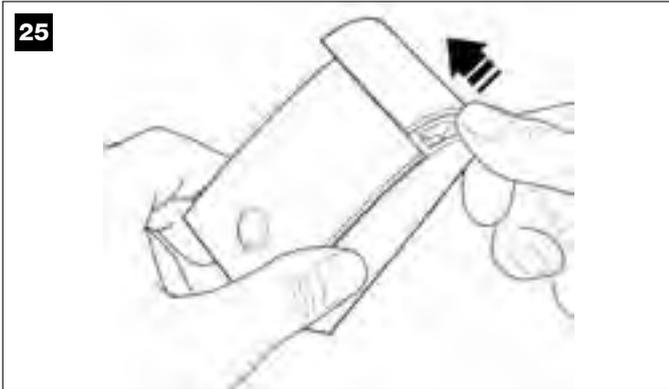
Each photocell must be positioned on each side of transit and be facing each other.

The system can be equipped with up to 6 pairs of photocells for safety (enabling detection of obstacles present on the trajectory line between the photocells) and a pair of photocells used to command an Opening manoeuvre only (to install additional photocells, refer to section "**Selecting operating modes of photocell pairs**").

To install and connect a pair of photocells proceed as follows:

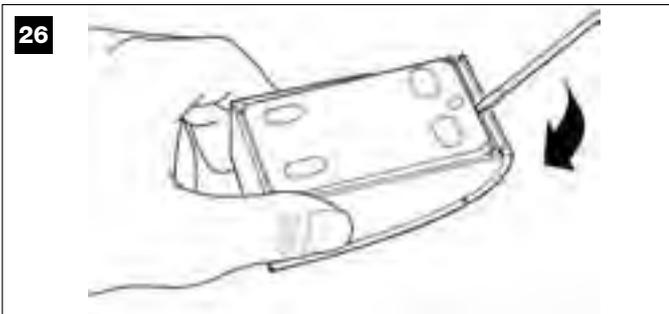
#### 01. Fig. 25:

Remove the screw cover cap by pushing down one side as shown in the figure.



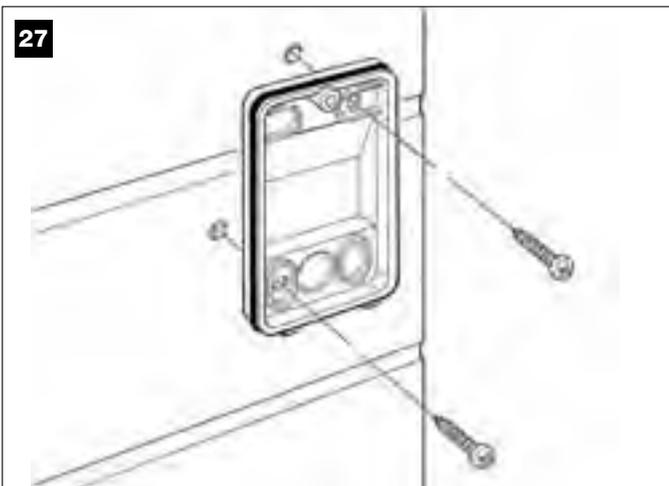
#### 02. Fig. 26:

Using a screwdriver, open and detach the base of the photocell.



#### 03. Fig. 27:

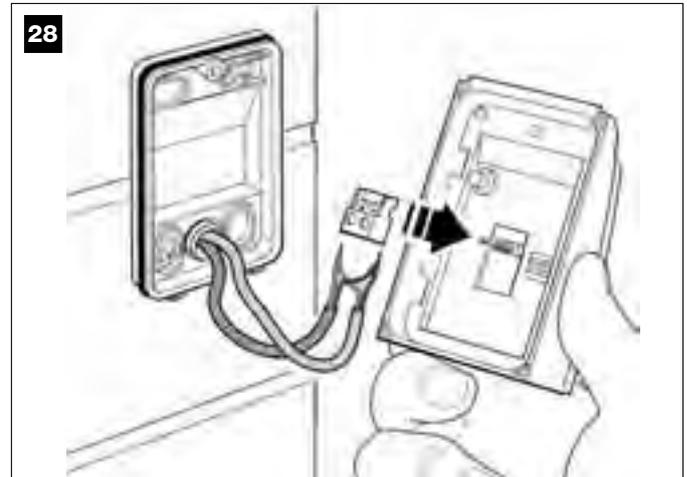
- Drill a hole on the pre-cut section on the base for routing the connection cables.
- Fix the photocell base to the wall with the relative screws, routing the cables through the prepared hole.



#### 04. Fig. 28:

- Connect the wires of the two cables and secure on the terminal board.
- Insert the terminal board in the male connector at the rear of the photocell.

**IMPORTANT!** – Before closing the photocell, the photocell operating mode must be selected by means of the relative jumper (refer to section "**Selecting operating modes of photocell pairs**").



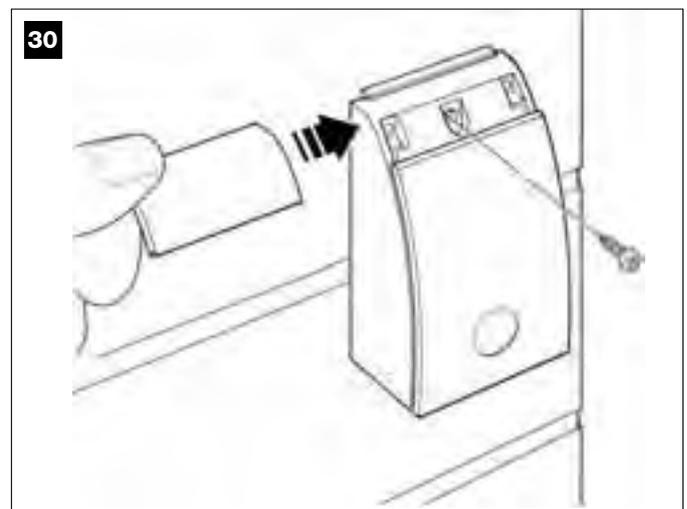
#### 05. Fig. 29:

Refit the cover, ensuring that the serrated section engages with that of the photocell base.



#### 06. Fig. 30:

Fix the photocell cover to the base by means of the screw supplied. Lastly refit the screw cover cap as shown in the figure.



## SELECTING THE PHOTOCELL PAIR OPERATING MODE

Additional pairs of photocells can be installed at any time on a system for sliding gates.

Up to a maximum of 6 pairs of photocells with safety functions can be added (as shown in the example **A-B-C-D-E-F** in **fig. 31**) and 1 pair with a control function (as shown in the example **G** in **fig. 31**) which performs an *Opening* manoeuvre only.

For the correct location of these pairs of photocells, refer to **fig. 31**.

In order for the control unit to recognise each pair of photocells and the specifically assigned function, the devices must be assigned with addresses by the insertion of one or two electric jumpers (**Table 2**) or no jumper at all (**Table 2**). In this way when the control unit receives the input from the photocells it will activate the motor for the corresponding manoeuvre.

The address assignment procedure is performed both on the TX and RX photocell as follows:

### For photocells "A-B-C-D-E-F"

Take care to observe the following warnings:

- **the electric jumpers must be positioned on the two elements making up the pair of photocells (TX and RX) in the same position;**
- **the same configuration used on one pair of photocells must NOT be used on other photocells.**

To program these pairs of photocells (if fitted on the system) proceed as follows:

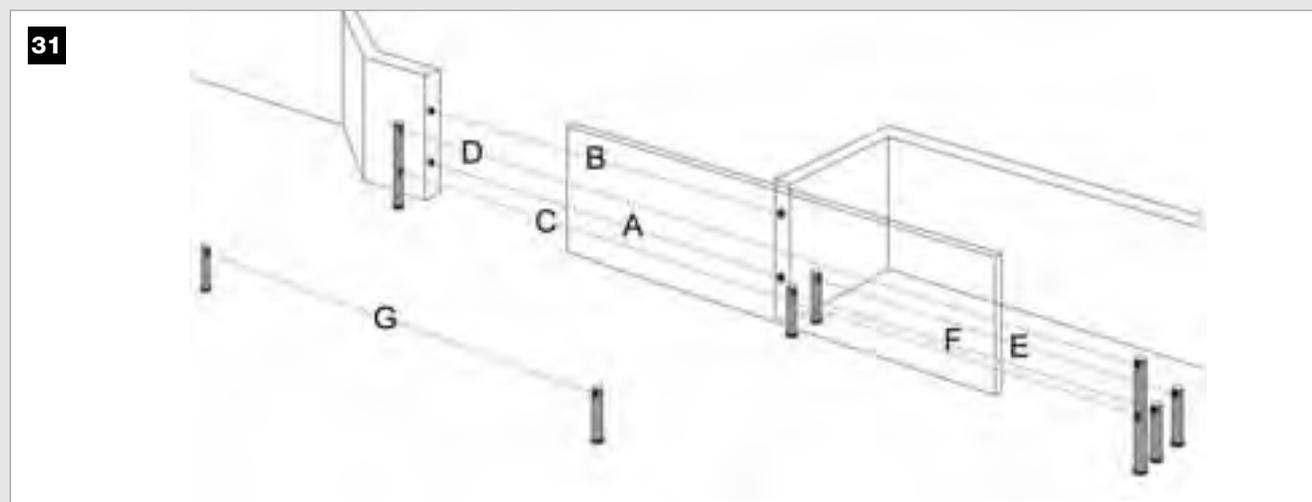
01. Open the cover of the photocell.
02. In **fig. 31** locate the position in which the specific photocells are installed.
03. In **Table 2** select the required configuration and insert electric jumpers in the two photocells.

### For photocells "G"

Take care to observe the following warnings:

- These photocells have a different function from the other (controlling the automation), and therefore must be positioned at a specific distance to avoid possible interference.
- These photocells remain powered also when the automation is on standby and in the event of a power failure, if the buffer battery is fitted, this will reduce the standard lifetime (see **STEP 6.5**).

To program these pairs of photocells (if fitted on the system) no electric jumper must be inserted (see **Table 2**).



**TABLE 2**

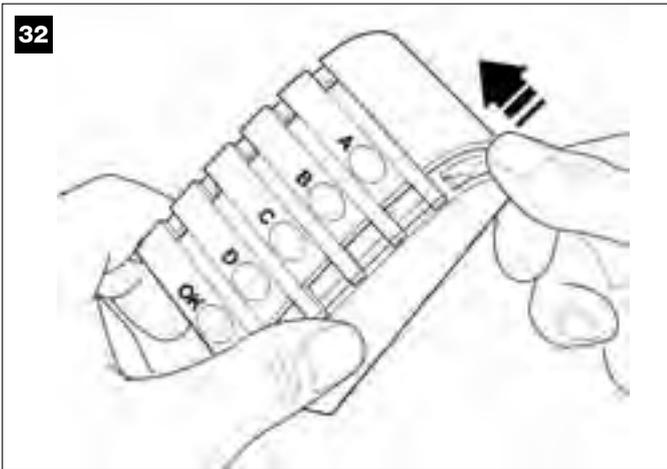
Pair of photocells	Electric jumpers	Pair of photocells	Electric jumpers
<b>A</b> Photocells h = 50 cm (these are activated when the gate is in the Closing phase)		<b>E</b> Photocells on right (these are activated when the gate is in the Opening phase)	
<b>B</b> Photocells h = 100 cm (these are activated when the gate is in the Closing phase)		<b>F</b> Photocells on left (these are activated when the gate is in the Opening phase)	
<b>C</b> Photocells h = 50 cm (these are activated when the gate is in the Opening or Closing phase)		<b>G</b> Gate opening only command	
<b>D</b> Photocells h = 100 cm (these are activated when the gate is in the Opening or Closing phase)			

## 6.4 – INSTALLING AND CONNECTING KEYPAD mod. MK

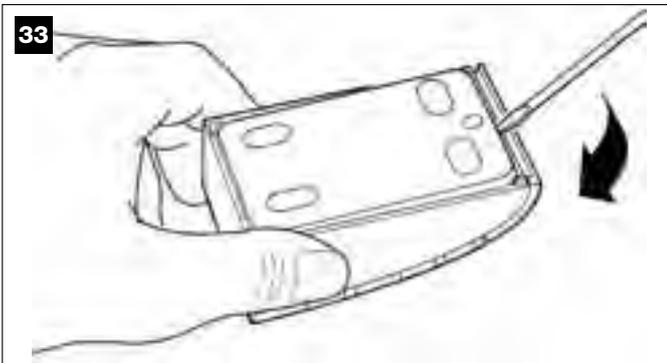
The control keypad is a wall-mounted device used for control of the automation via a Bus connection. Up to 4 keypads can be connected in a single system and the device can be programmed to operate in two modes: Traditional mode (each key performs a specifically assigned function- *factory set*) and safety mode (to activate a manoeuvre, a secret key sequence must be entered, as set by the user). The keypad is backlit for poorly lit conditions.

To install and connect the keypad proceed as follows:

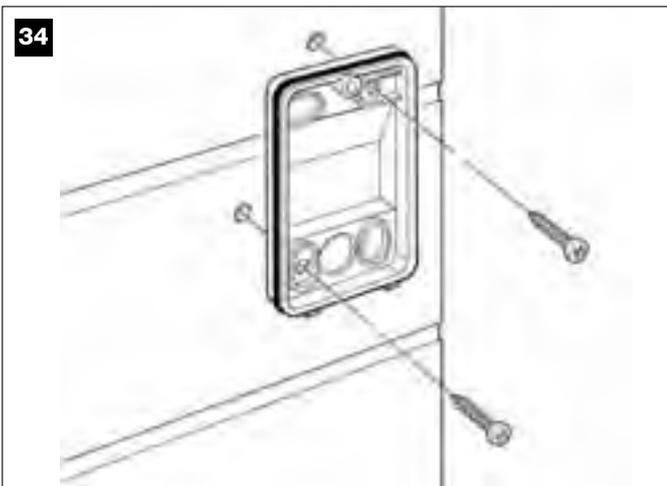
- 01. Fig. 32:**  
Remove the keypad cover by pushing down one side as shown in the figure.



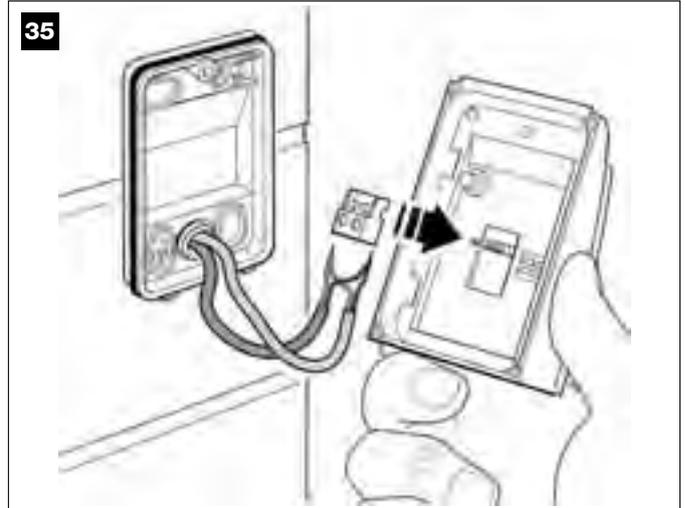
- 02. Fig. 33:**  
Using a screwdriver, open and detach the base of the keypad.



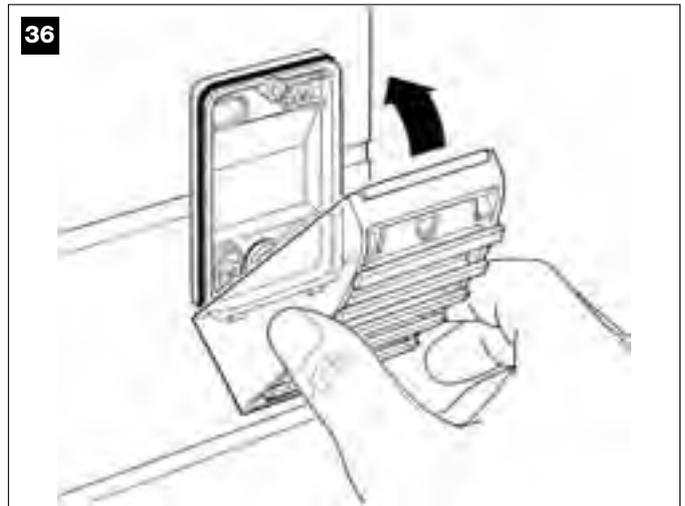
- 03. Fig. 34:**  
a) Drill a hole on the pre-cut section on the base for routing the connection cables.  
b) Fix the keypad base to the wall with the relative screws, routing the cables through the prepared hole.



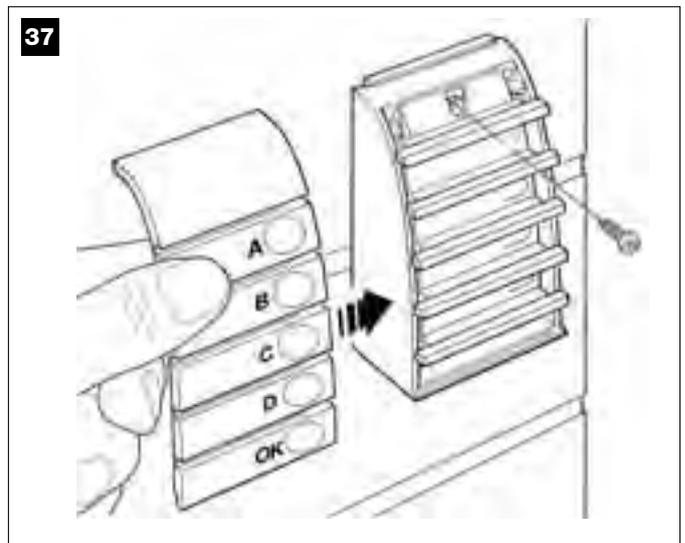
- 04. Fig. 35:**  
a) Connect the cable wires to the respective terminals.  
b) Insert the cable connector in the male connector at the rear of the keypad.



- 05. Fig. 36:**  
Refit the cover, ensuring that the serrated section engages with that of the keypad base.



- 06. Fig. 37:**  
Fix the keypad cover to the base by means of the screw supplied. Lastly refit the screw cover cap as shown in the figure.



**Note** – To program the keypads in the system, refer to STEP 9.3.

## 6.5 – INSTALLING BUFFER BATTERY mod. MB

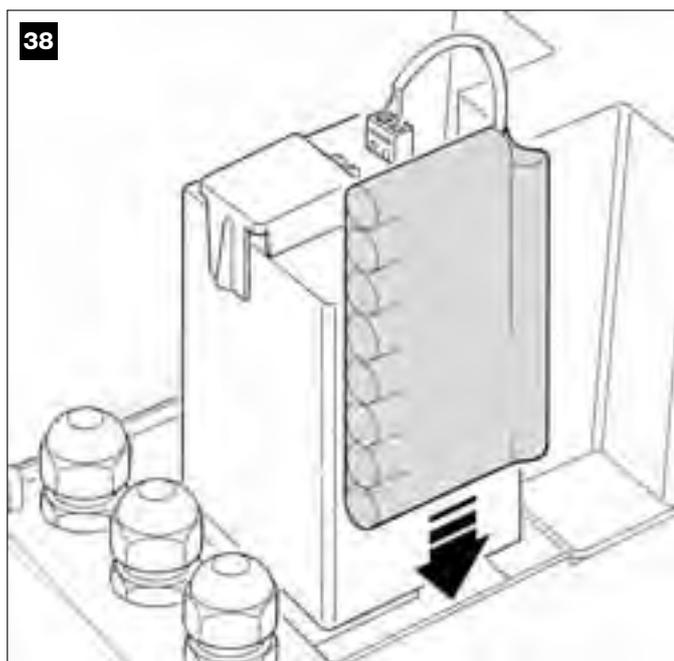
**CAUTION! – For safety reasons, the buffer battery must only be installed after completing installation and programming, and after checking correct operation of the system.**

The buffer batteries are self-charging with a voltage of 12V and power of 2100mAh. These are particularly useful in the event of a sudden power failure. The gearmotor with control unit enables installation of 1 battery. Depending on the type and weight of the gate, when charged, the battery guarantees an autonomy of approx. 6 - 7 consecutive movement cycles (1 cycle = *opening - closing*).

To install the buffer battery proceed as follows:

### 01. Fig. 38:

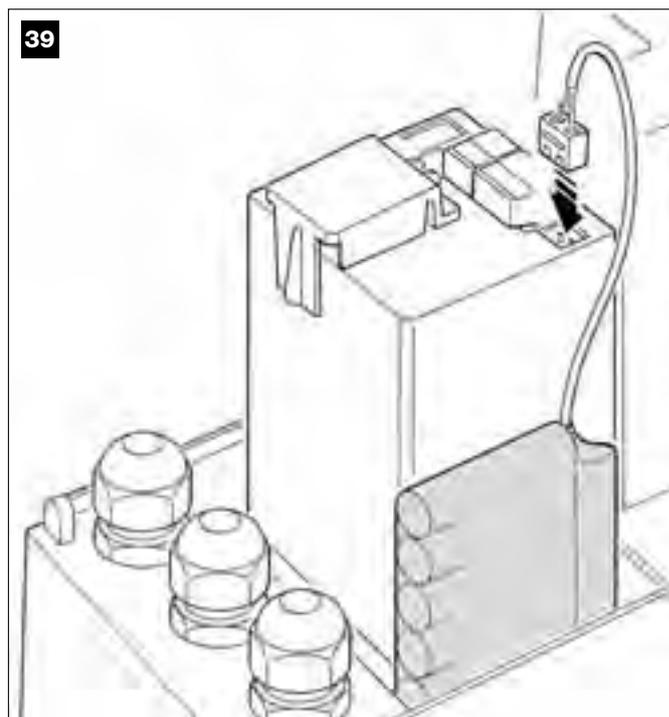
Inside the gearmotor, insert the battery in the space alongside the control unit.



**CAUTION! – The point below (02 – electrical connection of the buffer battery to the control unit ) must only be performed after completing all installation and programming phases, as the battery is an emergency power source.**

### 02. Fig. 39:

Insert the battery connector in the male connector on the control unit.



### WARNINGS

To guarantee optimal lifetime of the buffer battery, the following warnings should be observed:

- When the buffer battery is completely discharged, around 24 hours are required to completely recharge.
- The buffer battery is an emergency device: therefore in the event of a power failure, only moderate use is advisable. Excessive and continuous use can lead to overheating of the elements, which over time may reduce the normal lifetime of the battery.
- In the event of a power failure, never leave the automation powered exclusively by the buffer battery for periods longer than a day: The elements may overheat excessively and impair lifetime of the battery.

Therefore, if absent from the installation site of the automation for prolonged periods, it is recommended to detach the buffer battery terminal connected to the control unit.

- In the event of prolonged periods of disuse, the optional battery should be removed and stored in a dry location to avoid the risk of leaks of harmful substances.

### Battery disposal

**CAUTION!** – Even if discharged, the batteries can contain pollutant substances and therefore must NEVER be disposed of in common waste collection points. Dispose of according to separate waste collection methods as envisaged by current local standards.

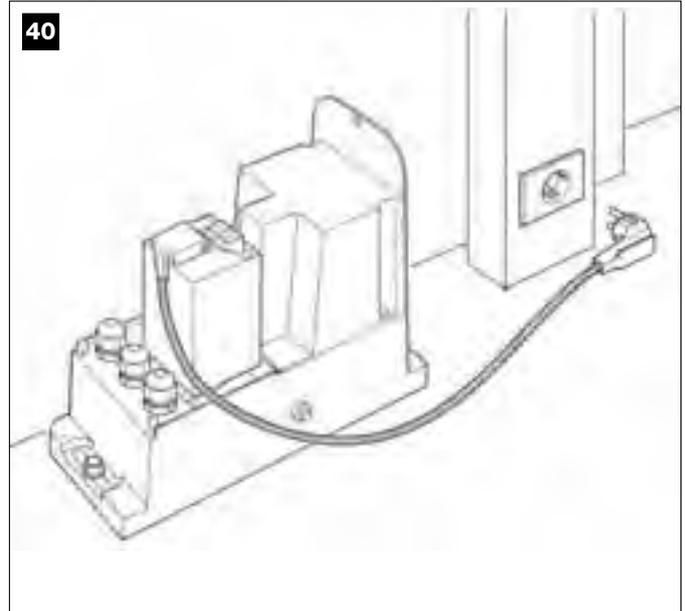
## POWER SUPPLY CONNECTION

## STEP 7

## WARNINGS!

- The PVC power supply cable supplied serves exclusively for automation operation and programming tests.
- **The final connection of the automation to the electrical mains and replacement of the cable supplied, must be performed by a qualified electrician, in compliance with local standards and the instructions in the section "Tasks reserved for qualified technicians".**
- **The replacement cable must be suitable for outdoors, such as type H07RN-F. The cable must also be protected against impact by means of an insulated protection duct.**

To perform the automation operation and programming tests, insert the power plug of the control unit (supplied) in a mains socket (fig. 40). If the socket is far from the automation, use a suitable extension lead.



## INITIAL START-UP AND ELECTRICAL CONNECTION CHECK

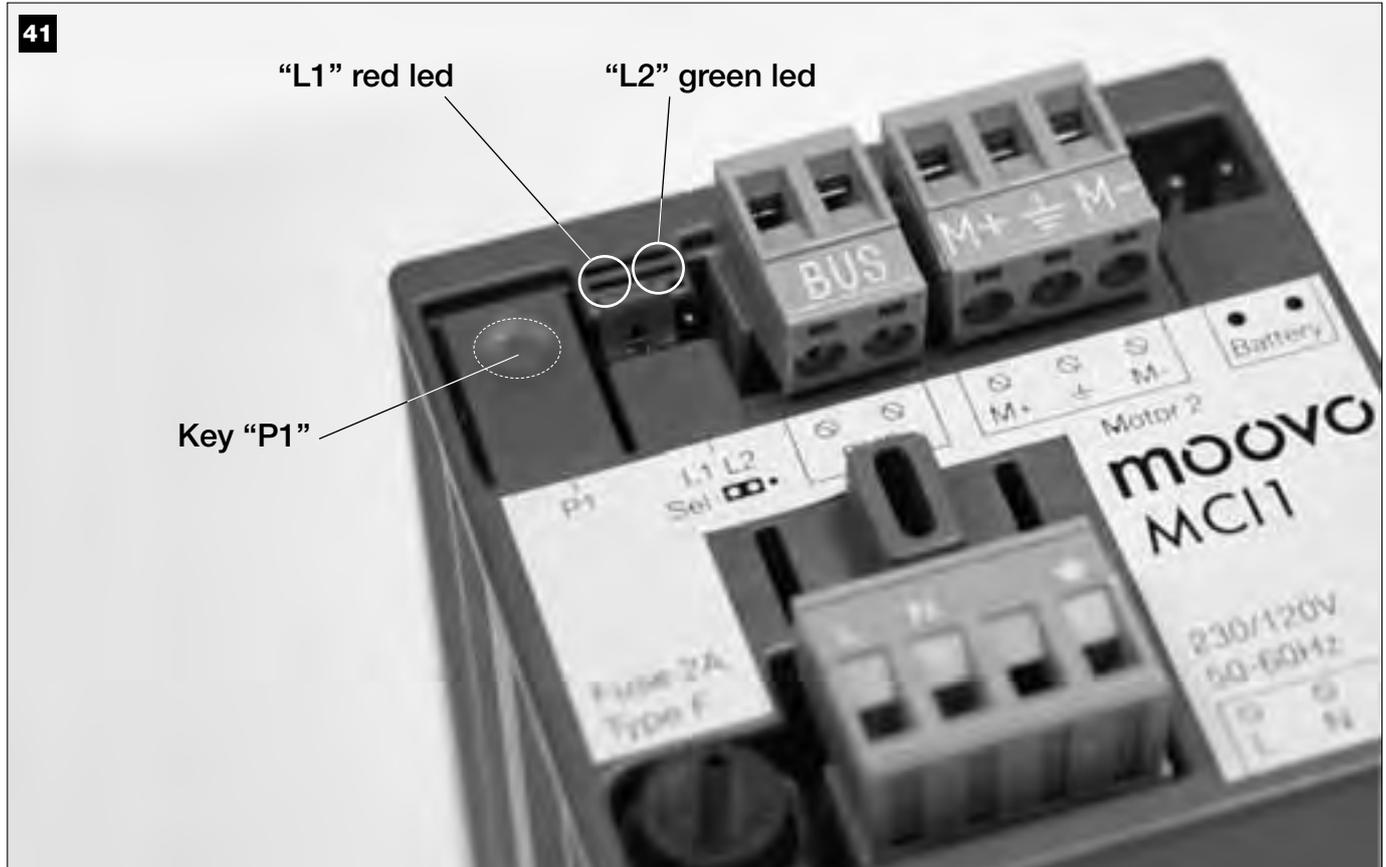
## STEP 8

**CAUTION!** – The following operations described in this manual will be performed on live electrical circuits and therefore manoeuvres may be hazardous! Therefore proceed with care.

After powering up the control unit (fig. 50), the red Led and green Led (fig. 41) emit a series of flashes.

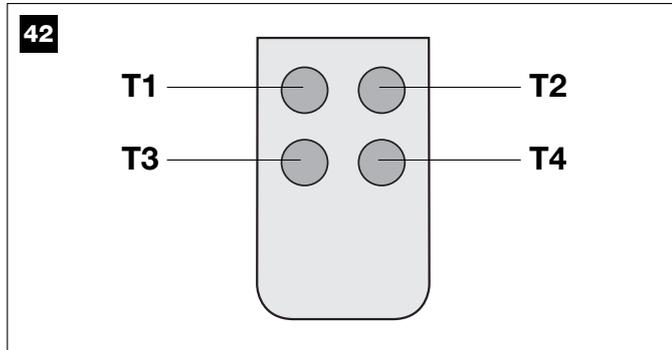
At the end of this phase, the red led starts flashing at regular intervals. This confirms correct operation of the control unit.

**CAUTION!** – If the red led does not flash as described above, disconnect the Control unit from the power supply and carefully check all connections (refer also to the paragraph "What to do if...").



**WARNINGS for programming:**

- Always **read** the procedure **first** and **then perform** the operations **in the correct sequence**.
- In this manual the transmitter keys are identified by means of numbers. To check the correspondence of **numbers** and the transmitter **keys** see **fig. 42**.



**STEP 9**

**9.1 – MEMORISING THE DEVICES CONNECTED BY MEANS OF “BUS” CABLE AND THE LEAF “CLOSING” AND “OPENING” LIMIT POSITIONS**

After ensuring correct operation of the control unit, it must be programmed as described in the sequence below:

**Note** – During this procedure, the user can exit the process at any time (without saving the operations performed) by pressing “P1” **once** on the control unit (fig. 41). In particular, from point 07 onwards, the user can also exit the procedure by activation of a safety device (photocell or other...).

**01. (on the gate)**

Release the gearmotor by means of the special release key (see chapter “**MANUALLY releasing or locking the gearmotor**” in the section TECHNICAL DOCUMENTATION) and manually move the gate leaf to mid-travel. Then lock the gearmotor again.

**02. (on the control unit)**

Press and hold the key “P1” for at least **5 seconds**; the green and red Leds illuminate. Then release the key when the green led turns off (the red led remains lit through to the end of the procedure) and proceed as follows:

**03. (on safety Photocells)**

**Note** – The time available for this check is unlimited.

Check correct operation of these types of photocells, ensuring that the relative Led **flashes slowly**. Otherwise if it is lit or off, correct alignment between the photocells attempting to obtain a flashing frequency that is slow as possible (the slower the flashing speed, the better the photocell alignment).

- **slow flashing light** = correct photocell alignment;
- **light permanently lit** = incorrect alignment (revise photocell alignment);
- **light off** = photocells installed incorrectly (check “Bus” connection of photocells).

**04. (on control Photocells)**

Activate this type of photocell (if fitted on the system), interrupting the beam **once only**. Successful learning is confirmed by the flashing light (1 flash) and the keypad (1 beep), if fitted on the system.

**05. (on the keypads)**

Activate the keypads (if fitted on the system) by pressing any **key on each one** as required.

Successful learning is confirmed by 2 beeps at short intervals, emitted by the keypad and 1 flash of the flashing light, if fitted on the system.

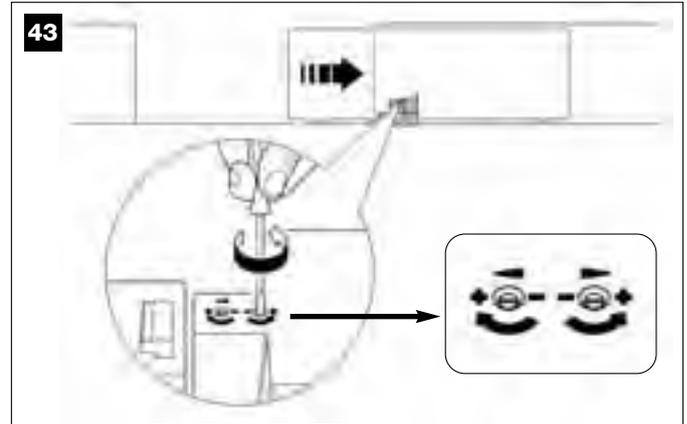
**06. (on the control unit)**

Press and hold the key “P1” for at least 5 seconds; the green led illuminates and release the key when the green Led turns off.

**07. (on the gate)**

At this point the gate leaf moves independently to reach the Opening limit position.

**Note** – If fine adjustments to the travel limit position are required, use the adjustment screw inside the gearmotor as follows (fig. 43): Locate the screw with the arrow corresponding to the direction in which the leaf is moved, and adjust until the leaf reaches the required limit position.



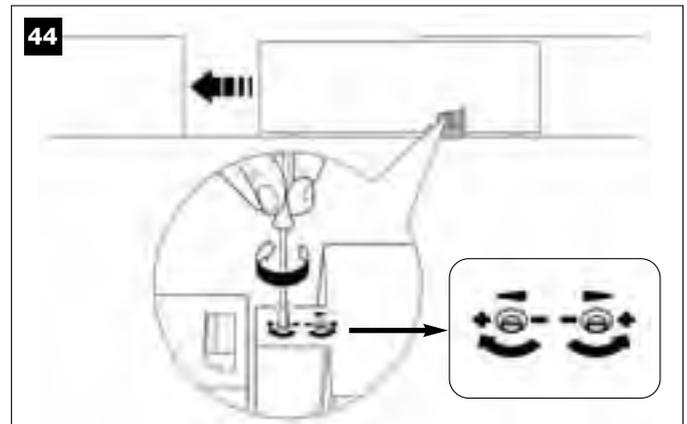
**08. (on the control unit)**

Press and hold the key “P1” for at least 5 seconds; the green led illuminates and release the key when the green Led turns off.

**09. (on the gate)**

At this point the gate leaf moves independently to reach the **Closing** limit position.

**Note** – If fine adjustments to the travel limit position are required, use the adjustment screw inside the gearmotor as follows (fig. 44): Locate the screw with the arrow corresponding to the direction in which the leaf is moved, and adjust until the leaf reaches the required limit position.



**10. (on the control unit)**

Press and hold the key “P1” for at least **5 seconds**; the green led illuminates and release the key when the green Led turns off.

At this point the control unit independently starts 2 manoeuvres also indicated by the flashing light:

- 1 - Leaf opening.
- 2 - Leaf closure.

At the end of the last manoeuvre, the red led turns off (= procedure completed) and then resumes flashing at regular intervals.

If the results of these checks do not conform with specifications, stop the procedure immediately by pressing **P1** on the control unit **once**. Then repeat the entire procedure 9.1 and check correct operation of the photocells, or modify settings of the “**Leaf sensitivity to obstacles**” as described in Chapter 10 “Automation operation adjustment” and if necessary check electrical connections.

### Memorising other devices connected by Bus cable at a later date

If in future the user decides to install and memorise other devices connected to the control unit by means of the Bus, **and procedure 9.1 has been completed previously**, the new devices can be memorised using the same procedure, starting from point 01 through to point 06. On completion, press **P1** once on the control unit to complete the memorisation process.

## 9.2 – MEMORISATION OF TRANSMITTER mod. MT4

**CAUTION!** – Always read the procedure first and then perform the operations in the correct sequence without allowing more than 10 seconds to pass between releasing one key and pressing the next.

To enable control of the automation with the transmitter, the keys must be memorised in the control unit memory. Memorisation enables the association of each key with the required command, selecting from the following:

**1 = Step-Step:** Corresponds to the sequence ... *Open - Stop - Close - Stop...* The first command activates *Opening*; the next, with the leaf moving, activates *Stop*; the third activates *Closure*; the fourth with the leaf moving activates *Stop* and so on...

**2 = Step-Open:** Corresponds to the sequence ... *Open - Stop - Close - Open...* The first command activates *Opening*; the next, with the leaf moving, activates *Stop*; the third activates *Closure*; the fourth with the door moving activates *Open* and so on...

**3 = Partial open:** Corresponding to total *opening* of the leaf. This command is only activated if the leaf is in the lower position (1 m) with respect to the *Partial Open* position; otherwise a Step-step command is activated.

**4 = Apartment block open:** This command is used for apartment blocks and envisages programming of all apartment block transmitters with a single "apartment block opening" key. This command operates as follows:

- if the command is sent when the gate is completely closed, the *Opening* manoeuvre is started.
- if the command is sent while an *Opening* manoeuvre is in progress, the manoeuvre continues;
- if the command is sent while a *Closing* manoeuvre is in progress, the manoeuvre is interrupted and an *Opening* manoeuvre is started;
- if the command is sent when the gate is completely open, the *Closing* manoeuvre is started. **Note – Automatic closure of the gate is also possible, by programming a pause time as required (see chapter 10).**

A single procedure memorises **a single key** of the transmitter on this control unit. The control unit memory can memorise up to 150 keys. For each key to be memorised, repeat the following procedure.

- 01.** Select which transmitter key is to be memorised (for example: *Key T3*).
- 02.** Decide on the command (from those listed below) to be associated with the selected key (for example: *Command "2"*).
- 03.** Press "**P1**" (on the Control unit) the same number of times as the selected command number (in the example "**2**", i.e. twice) and check that the green led emits the same number of quick flashes (repeated at regular intervals).
- 04.** (within 10 seconds) Press and hold the transmitter key to be memorised for at least 5 seconds (in the example, key T3).

If the memorisation procedure is successful, the green led emits 3 long flashes (= memorisation OK). **Note – Before the 10 second interval elapses, the key of a NEW transmitter with the same command can be memorised (useful, for example, when several transmitters need to be memorised on the same control unit).**

Otherwise wait until the green led turns off (= procedure completed) and for the red led to resume flashing at regular intervals.

## 9.3 – PROGRAMMING KEYPAD mod. MK

The control keypad can be programmed for two alternative operating modes:

- **TRADITIONAL mode** (without the use of a personal password)
- **SAFETY mode** (with use of a personal password)

After memorisation (see *STEP 9.1*) the keypad is set to "Traditional mode" (factory setting) but this may be modified as described below.

### "Traditional" operating mode"

In this mode the keys are independent and each commands a specific action. The commands are:

- Key "**A**" = **Step-step** command
- Key "**B**" = **"Partial open"** command
- Key "**C**" = **Open** Command
- Key "**D**" = **Close** command
- Key "**OK**" = **Stop** Command

### "Safety" operating mode"

In this mode the keypad is enabled on entry of a password set by the user (from 1 to 10 letters) followed by the key **OK**. This combination of keys only sends the specific command that the user set during the mode programming phase.

**Note – If the Step-Step command is programmed, after the command is sent the user has 10 seconds in which to send a subsequent command, by simply pressing "OK". This eliminates the need to repeat password entry.**

### "SAFETY" MODE PROGRAMMING

- 01.** Press And hold keys "**A**" and "**B**" simultaneously for a few seconds, until the keypad emits a sequence of beeps that indicate start-up of programming.
- 02.** Using the keys enter the "*PUK code*" (10-letter code printed on the badge supplied with the keypad); and then press "**OK**".
- 03.** Using the keys enter the personal password (from 1 to 10-letters); and then press "**OK**".  
The keypad emits a series of *beeps*.
- 04.** From the list below, select the command to be programmed and on the keypad press the key to be associated with the command followed by **OK**:

<b>Step-Step</b> command	= key <b>A</b>
<b>Partial open</b> command	= key <b>B</b>
<b>Open</b> command	= key <b>C</b>
<b>Close</b> command	= key <b>D</b>
<b>Stop</b> command	= key <b>OK</b>

The keypad emits a series of *beeps* to indicate completion of programming.

### Modifying the Personal Password

To modify you personal password, repeat the entire "Safety mode" procedure, changing the existing password at point 03.

### "TRADITIONAL" MODE PROGRAMMING

To program this mode, perform only points **01** and **02** of the "Safety mode programming" procedure, and then "**OK**" twice.

The control unit has a number of optional functions to enable the user to add specific functionalities to the automation, thus personalising the product according to special needs.

**10 – AUTOMATION OPERATION ADJUSTMENT**

To personalise operation of the automation, a number of functions can be enabled or disabled, also with the option for modifications to settings as required. The functions are:

- **AUTOMATIC LEAF CLOSURE.** When this function is enabled, at the end of the Opening manoeuvre command by the user, the control unit automatically closes the gate again after a set time interval.
- **LEAF MOVEMENT SPEED.** This function enables entry of the required speed of the automation implemented to move the gate leaf.
- **AUTOMATION SENSITIVITY TO OBSTACLES.** During a manoeuvre, if an obstacle accidentally stops gate leaf movement (a strong gust of wind, a vehicle, person etc.) this function promptly detects the increase in motor stress to contract the obstacle and activates immediate total inversion of movement. If "automatic leaf closure" is set, the control unit re-attempts the movement a second time and on the third time, after a brief inversion, it stops the manoeuvre permanently.
- **DECELERATION MODES.** This function enables selection of the deceleration start point during gate leaf travel both in the Closing and Opening phases.  
**Note – This parameter is essential for guaranteeing a low impact force in the event of impact with an obstacle in the final phase of a manoeuvre.**

The values of these functions can be set according to personal requirements using the following procedure with a transmitter that has at least one key already memorised on the control unit.

**Note – During this procedure, each time a key is pressed the flashing light emits one flash.**

- 01.** Press and hold the keys "T1" and "T2" simultaneously on the transmitter for at least **5 seconds**, after which release. The two leds (green and red) on the Control unit flash to indicate entry to function programming mode (*the leds continue to flash throughout the procedure*).
- 02.** Press and hold a transmitter key (already memorised on that of the control unit) for at least **1 second** (*the green Led emits one flash*).
- 03.** Then select one of the four functions available and on the transmitter press the key associated with the function for at least 1 second (*the green Led emits one flash*):
  - **Automatic leaf closure** = (press key "T1")
  - **Leaf movement speed** = (press key "T2")
  - **Leaf sensitivity to obstacles** = (press key "T3")
  - **Leaf deceleration points** = (press key "T4")
- 04.** Lastly, refer to **Table 3**, select the required value in correspondence with the selected function and on the transmitter press the key associated with the selected value for at least **1 second** (*the green and red Leds emit one confirmation flash*).

**TABLE 3**

**AUTOMATIC LEAF CLOSURE**

- No closure → (press key "T1")
- Closure after 15 seconds → (press key "T2")
- Closure after 30 seconds → (press key "T3")
- Closure after 60 seconds → (press key "T4")

**LEAF MOVEMENT SPEED**

- Low → (press key "T1")
- Medium low → (press key "T2")
- Medium high → (press key "T3")
- High → (press key "T4")

**AUTOMATION SENSITIVITY TO OBSTACLES**

- High(\*) → (press key "T1")
- Medium high → (press key "T2")
- Medium low → (press key "T3")
- Low(\*) → (press key "T4")

**DECELERATION MODES**

- 20 cm in Opening / 20 cm in Closing  
**low impact speed** → (press key "T1")
- 20 cm in Opening / 70 cm in Closing  
**low impact speed** → (press key "T2")
- 70 cm in Opening / 70 cm in Closing  
**low impact speed** → (press key "T3")
- 70 cm in Opening / 70 cm in Closing  
**very low impact speed** → (press key "T4")

**Notes to Table 3:**

- The Table states the values available for each of the 4 special functions and the corresponding key to be pressed on the transmitter for selection of the specific value.
- The factory settings are highlighted in grey.
- (\*) – The "High" parameter means that the gate can detect obstacles that generate a low force, such as a strong gust of wind.
  - The "Low" parameter means that the gate can detect obstacles that generate a high force, such as a stationary car.
- In the event of a power failure, on restoral of power the first manoeuvre command will be executed at low speed, regardless of the type of speed set.

**11 – MEMORISING A NEW TRANSMITTER WITH PROCEDURE IN THE VICINITY OF THE CONTROL UNIT [with a transmitter already memorised]**

A NEW transmitter can be memorised in the control unit memory without acting directly on key P1 of the control unit, but by simply working within its reception range. To use this procedure, an OLD transmitter, previously memorised and operative, is required. This enables memorisation of the same function of a specific key on the OLD transmitter on any key of the NEW transmitter.

**Warnings:**

- The procedure must be performed within the reception range of the receiver (maximum 10-20 m from receiver).
- The procedure memorises a single key of the new transmitter. To memorise other keys, repeat the same procedure

- 01.** On the NEW transmitter, press and hold the key to be memorised for at least **5 seconds** and then release.
- 02.** On the OLD transmitter, slowly press the control key to be memorised on the other transmitter **3 times**.
- 03.** On the NEW transmitter, press the same key pressed in point 01 **once**.

## 12 – DELETING DATA FROM THE CONTROL UNIT MEMORY

Data in the control unit memory can be deleted partially or totally as required. To do this, the following procedures can be used, as required:

- Deletion of a command on a transmitter already memorised
- Deletion of other data memorised on the control unit

### **Deleting a command on a transmitter already memorised**

The following procedure enables deletion of a single command assigned to a transmitter key from the control unit memory.

**Note** – During the procedure, the red and green leds remain permanently lit.

01. Press and hold the key “P1” on the Control unit for at least **10 seconds**: the **green** Led illuminates first, then the **red** led illuminates after 5 seconds and then both, to indicate that the Control unit has entered memory deletion mode (**WARNING! do not release the key P1!**).
02. Without releasing key P1 press the transmitter key to be deleted: if the control unit recognises this operation, the **green** led emits a short flash, after which the **P1** key and transmitter key can be released.

### **Deleting other data memorised on the control unit**

The following procedure enables deletion of various types of **memorised** data from the control unit memory, as specified in **Table 4**.

**Note** – During the procedure, the red and green leds remain permanently lit.

01. Press and hold the key “P1” on the Control unit for at least **10 seconds**: the **green** Led illuminates first, then the **red** led illuminates after 5 seconds and then both, to indicate that the Control unit has entered memory deletion mode. Then release the key.
02. With reference to **Table 4**, select the data to be deleted and press **P1** the same number of times as the number of presses specified in brackets (*the green led emits one flash each time the P1 key is pressed*).
03. 5 seconds after the key “P1” is pressed for the last time, if deletion is successful, both leds (red and green) flash quickly (= *memory deleted*).

**Note** – Before deletion, there is a margin time of 5 seconds, in which the user has the option to change decision and exit the procedure without deleting data by pressing key P1 five times.

**IMPORTANT!** – After deletion of the “Memory of Closing and Opening limit positions” and “TOTAL Memory”, the procedure **9.1** – “memorising the devices connected by means of “bus” cable and the leaf “Closing” and “Opening” limit positions.”

**TABLE 4**

- Memory of Optional Function values (= **1 press**)
- Memory of “**Closing**” and “**Opening**” limit positions (= **2 presses**)
- Memory of Transmitters (= **3 presses**)
- TOTAL memory (= **4 presses**) *Note – deletes the first three memories in one process*

## 13 – AUTOMATION TESTING AND COMMISSIONING

After completing all programming phases, including adjustments, the automation must undergo the testing and commissioning procedures as specified in the section “**Tasks reserved for qualified technicians**”.

## 14 – INSTALLING AND CONNECTING A BUFFER BATTERY

After completing the testing and commissioning phases, it is possible to install and connect a buffer battery mod. MB, if envisaged in the system. For this operation refer to **STEP 6.5**.

## WHAT TO DO IF... (Troubleshooting guide)

During normal operation, the control unit constantly monitors the automation processes and is designed to indicate any faults that arise, by means of a pre-set sequence of flashes emitted by the flashing light and red led "L1" on the control unit (the diagnostics flashes always refer to the last action performed by the automation). For an explanation of the number of flashes and associated cause, refer to **Table 5** below:

<b>TABLE 5</b>		
Flashes	Problem	Solution
2 flashes - <i>pause</i> - 2 flashes	During the <i>Opening</i> or <i>Closing</i> manoeuvre the door blocks or inverts the manoeuvre in progress.	This reaction is caused by the activation of a specific pair of photocells in the system, on detection of an obstacle. Therefore remove the obstacle on the trajectory of these photocells.
3 flashes - <i>pause</i> - 3 flashes	<ul style="list-style-type: none"> <li>During the <i>Opening</i> or <i>Closing</i> manoeuvre the door blocks suddenly and the control unit activates a <u>total</u> inversion of the manoeuvre in progress to reach the limit switch.</li> </ul> <b>Note</b> – During this inversion, if the leaf detects a second obstacle, it inverts movement again, and if a third obstacle is detected the gate blocks movement without reaching the travel limit. <i>(The automation is factory-set not to exceed three attempts).</i>	The leaf is subject to increased friction due to a sudden obstruction (a strong gust of wind, vehicle, person etc.). If adjustment to sensitivity is required, refer to the Chapter " <b>Adjustments and other optional Functions</b> ".
4 flashes - <i>pause</i> - 4 flashes	During the <i>Opening</i> or <i>Closing</i> manoeuvre the gate leaf blocks suddenly and the control unit activates a <i>Stop</i> followed by a brief inversion of movement.	A safety device installed (other than photocells, such as sensitive edges) has detected a sudden obstacle. Therefore remove the obstacle.
5 flashes - <i>pause</i> - 5 flashes	The automation does not respond to commands.	There is a system configuration error. Ensure correct insertion of the jumper "Sel" on the control unit. Then repeat installation.
6 flashes - <i>pause</i> - 6 flashes	After a series of manoeuvres sent consecutively, the automation is blocked.	The maximum admissible number of consecutive manoeuvres has been exceeded, causing excessive overheating. Wait for a few minutes to enable the temperature to return below the maximum limit.
7 flashes - <i>pause</i> - 7 flashes	The automation does not respond to commands.	Error in internal electric circuits. Disconnect all power circuits, wait a few seconds and then reconnect. Retry a command; if the automation does not respond this may indicate a serious fault with the electrical board of the control unit or motor wiring. Check and make replacements as necessary.
8 flashes - <i>pause</i> - 8 flashes	The automation does not respond to commands.	Error in "Bus" internal electric circuits. Check operation of the connected devices one by one. These may be short circuited or malfunctioning.



## Tasks reserved for qualified technicians

**CAUTION!** – All operations in this section must be performed exclusively by skilled and qualified personnel, in observance of the instructions in the manual, and current local legislation and safety standards in the place of installation.

### CONNECTING THE AUTOMATION TO THE ELECTRICAL MAINS WITH A CABLE OTHER THAN THE VERSION SUPPLIED

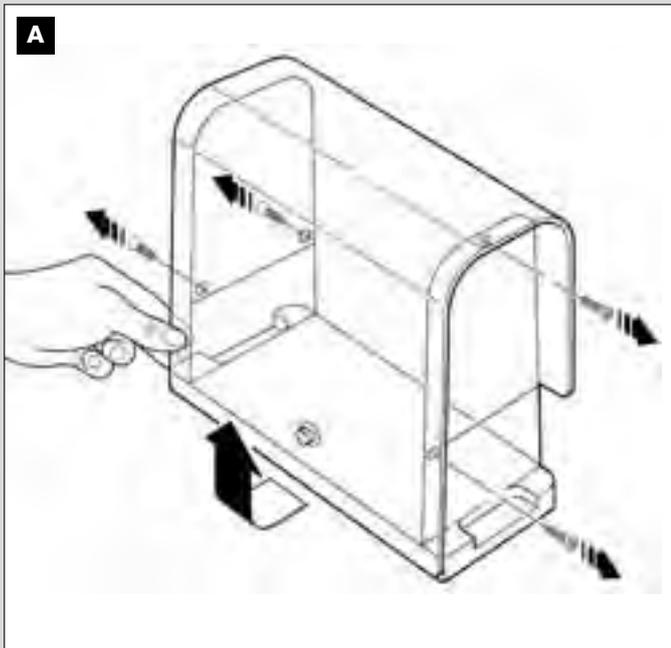
**CAUTION!** – Incorrect connections can cause faults or hazards; therefore ensure that the specified connections in this paragraph are strictly observed.

In the case of this product, the cable supplied may need to be replaced with a protected electric line suited to the installation.

In this case, use a power cable with the dimensions 3 x 1,5 mm<sup>2</sup>, and maximum length of 30 m. For greater lengths, use a cable with a larger section: For example, 3 x 2,5 mm<sup>2</sup>, ensuring safety earthing in the vicinity of the automation. Then proceed as follows.

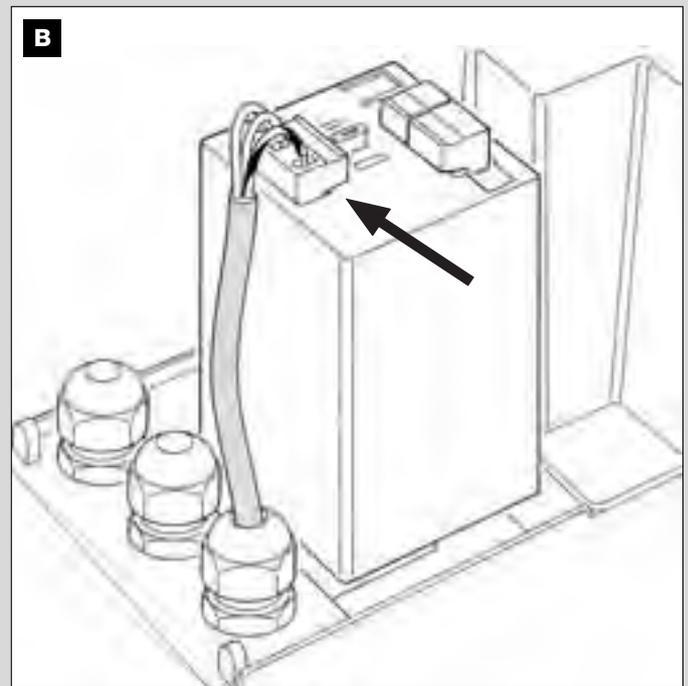
#### To connect the new cable to the Control unit:

**01. Fig. A** - Remove the gearmotor cover using a screwdriver to loosen the 4 lateral screws.



**02. Fig. B** - Loosen the power cable clamp, loosen the screw of the terminal board cover using a Phillips screwdriver and remove the existing cable. Then fix the new cable to the terminal board, observing the relative symbols. **Note** – the terminal board can be removed from its seat to facilitate wiring.

- **Brown** wire, to connect to “Phase”;
- **Blue** wire, to connect to “Neutral”;
- **Yellow-green** wire, to connect to “Earth”.



**03.** Then refit the terminal board cover and close the gearmotor with its cover.

#### To connect the new cable to the electrical mains:

**CAUTION!** – When making this connection, the electrical mains power line must be equipped with short-circuit protection device (between the automation and the mains).

The electrical mains line must also be equipped with a power disconnect device (with overvoltage category III, i.e. minimum gap between contacts of 3.5 mm) or an equivalent system such as socket with removable plug.

This device, when necessary, guarantees fast and safe disconnection of the power supply and therefore must be placed in a location visible from the automation. If the power disconnect device is not in the vicinity of the automation and not visible from the latter, it must be fitted with a lockout facility to prevent inadvertent or unauthorised connection.

**Note** – The disconnect devices are not supplied with the product.

## AUTOMATION TESTING AND COMMISSIONING

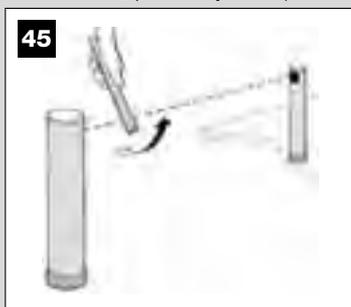
These are the most important phases of automation set-up to ensure maximum system safety.

The testing procedure described can also be performed as a periodic check of automation devices.

Testing and commissioning of the automation must be performed by skilled and qualified personnel, who are responsible for the tests required to verify the solutions adopted according to the risks present, and for ensuring observance of all legal provisions, standards and regulations: and in particular all requirements of the standard EN 12445, which establishes the test methods for checking automations for gates.

### AUTOMATION TESTING

- 1 Ensure that all specifications in STEP 1 regarding safety have been strictly observed.
- 2 Using the transmitter, perform gate opening and closing tests and ensure that the leaf movement corresponds to specifications.  
Test several times to assess smooth operation of the gate and check for any defects in assembly or adjustment and any possible points of friction.
- 3 Check operation of all system safety devices one at a time (photocells, sensitive edges, etc.). **Photocells:** Activate a single pair of photocells during a manoeuvre (see **Table 2** to identify which manoeuvre to perform) and check that the control unit stops the manoeuvre and activates a total inversion of the movement (the flashing light emits 2 flashes, twice). **Sensitive edges:** Activate the device during an *Opening* or *Closing* manoeuvre and check that the control unit stops the manoeuvre and activates a brief inversion of the movement (the flashing light emits 2 flashes, twice).
- 4 To check the photocells, and to ensure there is no interference with other devices, pass a cylinder (diameter 5 cm, length 30 cm) through the



optic axis joining the pair of photocells (**fig. 45**): pass the cylinder first close to the TX photocell, then close to the RX and lastly at the centre between the two. Ensure that in all cases the device engages, changing from the active status to alarm status and vice versa, and that the envisaged action is generated in the control unit (for example movement inversion in the *Closing* manoeuvre).

- 5 Measure the force as specified in the standard EN 12445. If the motor force control is used by the control unit as an auxiliary function for reduction of impact force, adjust the functions "Leaf movement speed" and "Leaf deceleration points" (Chapter 10) to identify the setting that obtains the best results. **CAUTION!** – If the gate weighs more than 200 kg, to ensure compliance with the parameters in the standard EN 12453, a flexible edge must be fitted at the end of the gate.
- 6 To check operation of the buffer battery, on completion of charging, test as follows: disconnect the power supply and after a few seconds check that the leds and flashing light emits a series of 5 flashes. If this does not occur, check that the battery connector is correctly inserted and invert if necessary.

### AUTOMATION COMMISSIONING

**Commissioning can only be performed after positive results of all test phases. Partial or "makeshift" commissioning is strictly prohibited.**

- 1 Prepare the automation technical documentation, which must contain the following documents: Overall layout drawing (see example in **fig. 5**), and electrical connection layout diagram (see example **fig. 17**) risk assessment and relative solutions adopted (see the website **www.moovo.com** for a guide to risk assessment for different types of gates), manufacturer's declaration of conformity for all devices used and the declaration of conformity compiled by the installer (see section TECHNICAL DOCUMENTATION).
- 2 Affix a dataplate on the door, specifying at least the following data: type of automation, name and address of manufacturer (responsible for commissioning), serial number, year of construction and CE mark.
- 3 Prepare and provide the owner with the declaration of conformity; the "**CE Declaration of conformity**" in the section TECHNICAL DOCUMENTATION must be compiled for this purpose.
- 4 Prepare and provide the owner with the form "**Operation manual**" in the section TECHNICAL DOCUMENTATION.
- 5 Prepare and provide the owner with the form "**Maintenance schedule**" in the section TECHNICAL DOCUMENTATION, containing all maintenance instructions for all devices in the automation.
- 6 Before commissioning the automation, ensure that the owner is adequately informed of all associated risks and hazards.

### PERIODIC MAINTENANCE OPERATIONS

This product does not generally require any special maintenance; nevertheless, regular check-ups are advisable to ensure the system is in good working order and that the safety devices installed work properly.

To carry out this maintenance correctly, please refer to the "**Maintenance Schedule**", which you will find in the "TECHNICAL DOCUMENTATION" section at the end of the manual.

### PRODUCT DISPOSAL

**This product is an integral part of the automation and therefore must be disposed together with the latter.**

As in installation, also at the end of product lifetime, the disassembly and scrapping operations must be performed by qualified personnel. This product comprises various types of materials: some may be recycled others must be disposed of. Seek information on the recycling and disposal systems envisaged by the local regulations in your area for this product category.

**Caution!** – some parts of the product may contain pollutant or hazardous substances which, if disposed of into the environment, may cause serious damage to the environment or physical health.

As indicated by the symbol alongside, disposal of this product in domestic waste is strictly prohibited. Separate the waste into categories for disposal, according to the methods envisaged by current legislation in your area, or return the product to the retailer when purchasing a new version.



**Caution!** - Local legislation may envisage serious fines in the event of abusive disposal of this product.

**GEARMOTOR LN432e**

DESCRIPTION	DATA	
Power supply	230 Vac - 50/60 Hz	
Maximum absorbed power	250 W	
Maximum torque	8,2 Nm	
Nominal torque	3,8 Nm	
Speed under no load	<i>low</i> 40 Rpm	<i>high</i> 70 Rpm
Nominal speed	35 Rpm	62 Rpm
Cycles/hour at nominal torque (20° C)	10	
Cycles/hour at nominal torque (50° C)	6	
Maximum cycle frequency in continuous mode	5	
Operating temperature	- 20 / + 50° C	
Dimensions (mm)	288 x 264 h x 174	
Weight	6 kg	
Maximum admissible leaf length	5 m	
Protection rating	IP 44	
Estimated durability (*)	from 80,000 to 150,000 manoeuvre cycles	

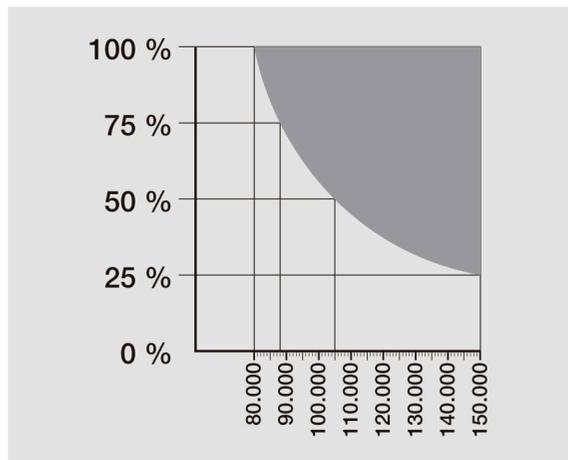
(\*) **Note** – The estimated durability of the product ranges from 80.000 to 150.000 manoeuvre cycles. To calculate the probable durability of your automation, proceed as follows:

a) – assess the conditions of use and force applied on your system, for example:

- the leaf weight and length;
- perfect leaf balancing;
- maintenance conditions of the leaf hinges;
- type of leaf: solid or with many openings;
- the presence of strong winds;
- frequency of automation use.

b) – from these values, obtain a value expressed as a percentage which, in general, defines the greatest or smallest degree of automation wear.

c) – on the graph alongside, locate the estimated percentage (at point “b”) and read the corresponding number of manoeuvre cycles.



**MF FLASHING LIGHT**

DESCRIPTION	DATA
Type	Flashing light for automations on gates and doors
Technology adopted	Luminous indicator with lamp controlled by Moovo control units with “Bus” system for automation
Lamp	12V 21W fitting BA15 (car type lamp)
Power supply	The device must be connected to the “Bus” terminal of the Moovo control units for automations
Ambient operating temperature	-20 ÷ 50°C
Use in acid, saline or potentially explosive atmospheres	No
Assembly	Vertical on surface or horizontal wall-mounted
Protection class	IP 44
Dimensions	135 x 120h x 110 mm
Weight	340 g

**MT4 TRANSMITTER**

DESCRIPTION	DATA
Type	Radio transmitters for control of automations on gates and doors
Technology adopted	AM OOK radio encoded modulation
Frequency	433.92 MHz ( $\pm$ 100 kHz)
Coding	Rolling code with 64 Bit code (18 billion, billion combinations)
Keys	4, each key can be used for different commands of the same control unit or different control units
Radiated power	1 dBm e.r.p.
Power supply	3V +20% -40% with 1 lithium battery type CR2032
Battery lifetime	3 years, estimated on the basis of 10 commands/day of the duration of 1s at 20°C (battery efficiency is reduced at low temperatures)
Ambient operating temperature	-20°C ÷ 50°C
Use in acid, saline or potentially explosive atmospheres	No
Protection class	IP 40 (use in the home or protected environments)
Dimensions	40 x 70h x 8 mm
Weight	25 g
Capacity	estimated at 200 m outdoors; 35 m if inside buildings (*)

(\*) All radio controls are subject to interference which may alter performance levels. Therefore in the event of interference, Nice cannot guarantee the effective capacity of their devices.

**MP PHOTOCELLS**

DESCRIPTION	DATA
Type	Presence detector for automations of automatic gates and doors (type D according to standard EN 12453) Comprising a pair of transmitters "TX" and receiver "RX"
Technology adopted	Direct TX-RX optical interpolation with modulated infrared beam
Detection capacity	Opaque objects placed on 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 7 m for maximum TX-RX offset $\pm$ 4° (the device can signal an obstacle also in the event di condizioni meteorologiche particolarmente avverse)
Power supply / Output	The device must be connected to the Moovo "Bus" terminal from which it is powered and sends the output signals
Absorbed power	450mW in operation; 40mW on stand by
Maximum cable length	Up to 20 m (observe warnings regarding the minimum section and type of cables)
Possibility of addressing	Up to 6 detectors with safety function and up to 4 with an opening control function. Automatic synchronisation prevents interference between the various detectors.
Ambient operating temperature	-20 ÷ 50°C
Use in acid, saline or potentially explosive atmospheres	No
Assembly	Vertical on surface or horizontal wall-mounted
Protection class	IP 44
Dimensions	50 x 85h x 35 mm
Weight (pair)	140 g

**MK KEYPAD**

DESCRIPTION	DATA
Type	5-key keypad, with possibility of activating the automation with or without entry of the code
Technology adopted	Possibility of entering an activation code of up to 10 digits (over 1 million possible combinations)
Power supply / Output	The device must be connected to the Moovo "Bus" networks from which it is powered and sends the output signals
Absorbed power	120mW in funzionamento; 45mW in stand by
Ambient operating temperature	-20 ÷ 50°C
Use in acid, saline or potentially explosive atmospheres	No
Assembly	Vertical wall-mounted
Protection class	IP 44
Dimensions	50 x 85h x 35 mm
Weight	80 g

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