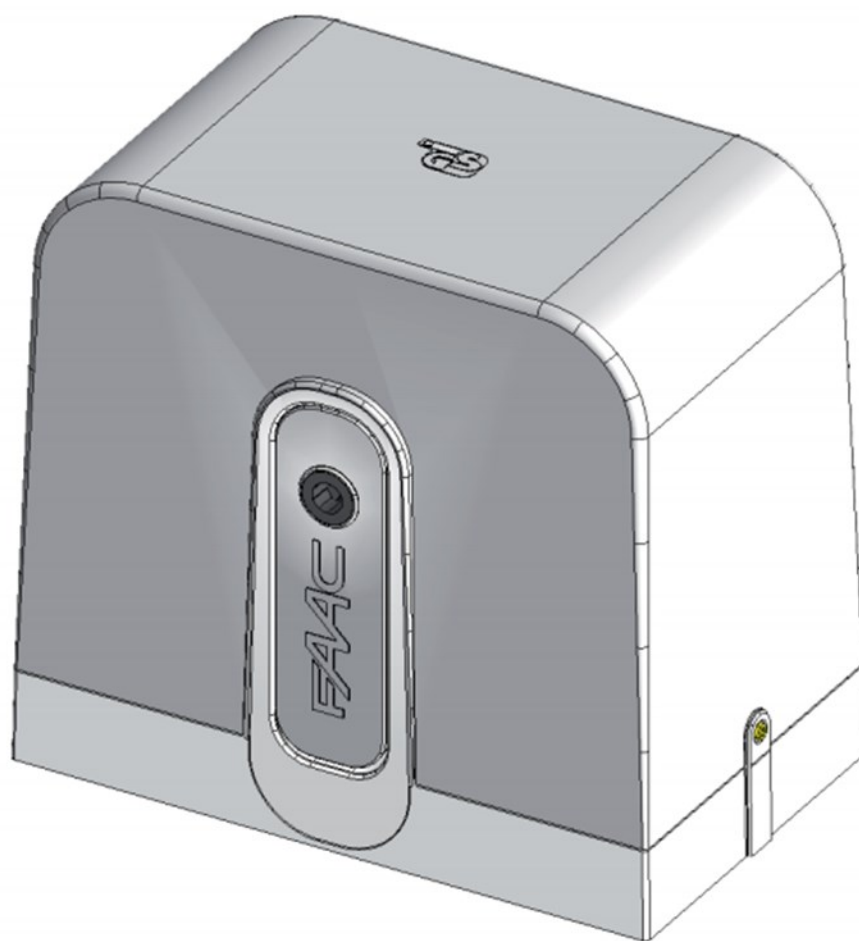


# C720 - C721

E-SL 1800



*Estate* SWING

**FAAC**

**Manufacturer:** FAAC S.p.A.  
**Address:** Via Calari, 10 - 40069 Zola Predosa BOLOGNA - ITALY  
**Declares that:** Operator mod. C720 - C721

is built to be integrated into a machine or to be assembled with other machinery to create a machine under the provisions of Directive 98/37/EC;

conforms to the essential safety requirements of the following EEC directives:

2006/95/EC Low Voltage Directive  
 2004/108/EC Electromagnetic Compatibility Directive

and also declares that it is prohibited to put into service the machinery until the machine in which it will be integrated or of which it will become a component has been identified and declared as conforming to the conditions of Directive 2006/42/EEC and subsequent amendments.

Bologna, 01-12-2010

The Managing Director  
 A. Marcellan



## WARNINGS FOR THE INSTALLER

### GENERAL SAFETY OBLIGATIONS

**1) ATTENTION! To ensure the safety of people, it is important that you read all the following instructions. Incorrect installation or incorrect use of the product could cause serious harm to people.**

2) Carefully read the instructions before beginning to install the product.

3) Do not leave packing materials (plastic, polystyrene, etc.) within reach of children as such materials are potential sources of danger.

4) Store these instructions for future reference.

5) This product was designed and built strictly for the use indicated in this documentation. Any other use, not expressly indicated here, could compromise the good condition/operation of the product and/or be a source of danger.

6) FAAC declines all liability caused by improper use or use other than that for which the automated system was intended.

7) Do not install the equipment in an explosive atmosphere: the presence of inflammable gas or fumes is a serious danger to safety.

8) The mechanical parts must conform to the provisions of Standards EN 12604 and EN 12605.

For non-EU countries, to obtain an adequate level of safety, the Standards mentioned above must be observed, in addition to national legal regulations.

9) FAAC is not responsible for failure to observe Good Technique in the construction of the closing elements to be motorized, or for any deformation that may occur during use.

10) The installation must conform to Standards EN 12453 and EN 12445.

For non-EU countries, to obtain an adequate level of safety, the Standards mentioned above must be observed, in addition to national legal regulations.

11) Before attempting any job on the system, cut out electrical power. 12) The mains power supply of the automated system must be fitted with an all-pole switch with contact opening distance of 1/8 in. or greater. Use of a 6A thermal breaker with all-pole circuit break is recommended.

13) Make sure that a differential switch with threshold of 0.03 A is fitted upstream of the system.

14) Make sure that the earthing system is perfectly constructed and connect metal parts of the closure to it.

15) The automated system is supplied with an intrinsic anti-crushing safety device consisting of a torque control. Nevertheless, its tripping threshold must be checked as specified in the Standards indicated at point 10.

16) The safety devices (EN 12978 standard) protect any danger areas against mechanical movement Risks, such as crushing, dragging, and shearing.

17) Use of at least one indicator-light (e.g. FAACLIGHT ) is recommended for every system, as well as a warning sign adequately secured to the frame structure, in addition to the devices mentioned at point "16".

18) FAAC declines all liability as concerns safety and efficient operation of the automated system, if system components not produced by FAAC are used.

19) For maintenance, strictly use original parts by FAAC.

20) Do not in any way modify the components of the automated system.

21) The installer shall supply all information concerning manual operation of the system in case of an emergency and shall hand over to the user the warnings handbook supplied with the product.

22) Do not allow children or adults to stay near the product while it is operating.

23) Keep remote controls or other pulse generators away from children, to prevent the automated system from being activated involuntarily.

24) Transit is permitted only when the automated system is idle.

25) The user must not attempt any kind of repair or direct action whatever and contact qualified personnel only.

26) Check at least every 6 months the efficiency of the system, particularly the efficiency of the safety devices (including, where foreseen, the operator thrust force) and of the release devices.

**27) Anything not expressly specified in these instructions is not permitted.**

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We thank you for choosing our products. We are certain that they will fully meet your needs with respect to the performance that have been designed for.

These products have been designed and built to control vehicle access. AVOID ANY DIFFERENT USE.

**!** Read this manual provided with the product carefully because it provides important information on safety, installation, use and maintenance.

**1 GENERAL REMARKS**

These instructions apply to the following models:

**C720 - C721 / E-SL 1800**

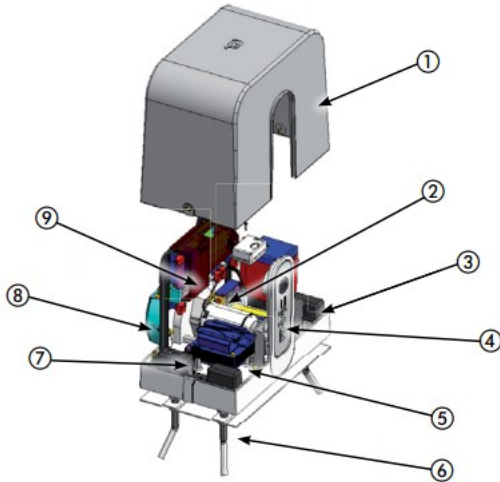
The above-mentioned models are electromechanical operators designed for sliding gates with different features and technical specifications.

A practical and functional mechanical lock that acts directly on the motor ensures the gate is locked when the operator is not working and, therefore, no electric lock needs to be installed.

A convenient manual release device allows the gate to be maneuvered in the event of a power cut, if emergency batteries are not installed or if the operator is not in service.

**!** These operators, in addition to having different features and technical specifications, also differ as to the following components: motor (larger in the C721), transformer (larger in the C721), pinion (different materials), release lever (different colors). These assembly instructions apply to both models, unless otherwise specified.

**2 Description and Technical Specifications**



- 1. Cover casing
- 2. Motor lock
- 3. Link cover
- 4. Motor release handle
- 5. Transformer
- 6. Foundation plate
- 7. Cable passage holes
- 8. Pinion and pinion cover
- 9. Electronic board

Model	C720 / E-SL 1800	C721
Power Supply	120V—50 Hz	230V—50 Hz
Max. Absorbed power (W)	170	290
Thrust pinion (N)	320	530
Max. Torque (Nm)	18	30
Type of pinion	Z28 module 4	Z28 module 4
Gate max. recommended length (m)	15	15
Max. leaf weight (Kg)	400	800
Gate speed (m/min)	Min 8 / Max 18	Min 8 / Max 18
Limit switch type	Magnetic	Magnetic
Clutch	Electronic	Electronic
Operating Temperature (°C)	-20 + 55	-20 + 55
Gearmotor weight (kg)	6	10
Protection class	IP44	IP44
Gearmotor dimensions	See Fig. 02	See Fig. 02
Use frequency	Residential	Residential

Dimensions in inches.

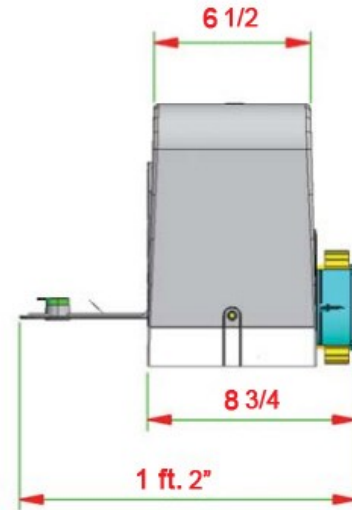


Fig. 2

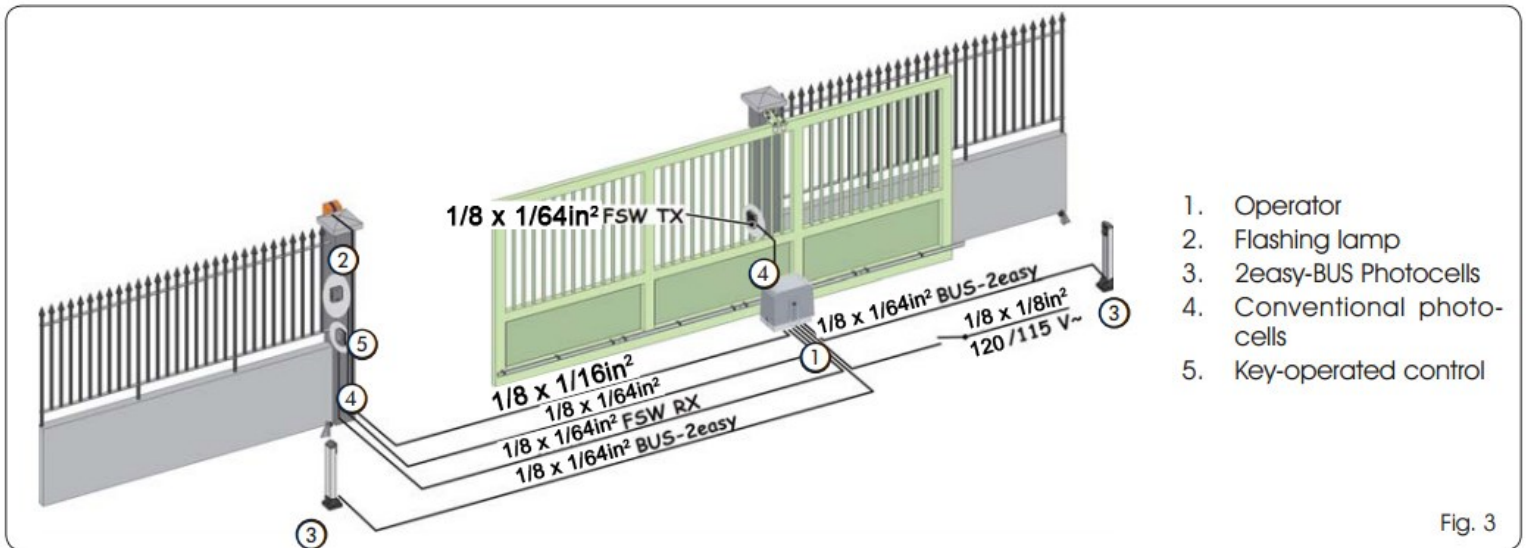


Fig. 3

The dimensions and electrical preparations (standard system) are the same for operator C720 / E-SL 1800 and for operator C721.

**5 INSTALLATION OF AUTOMATED SYSTEM**

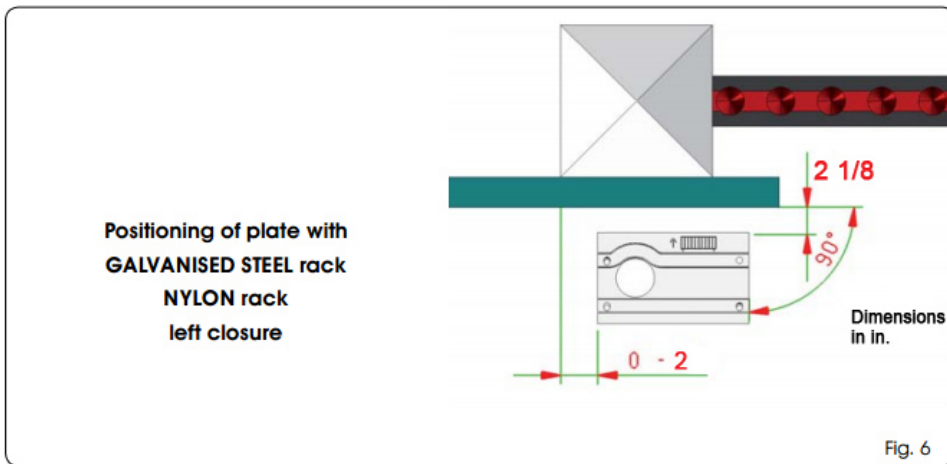
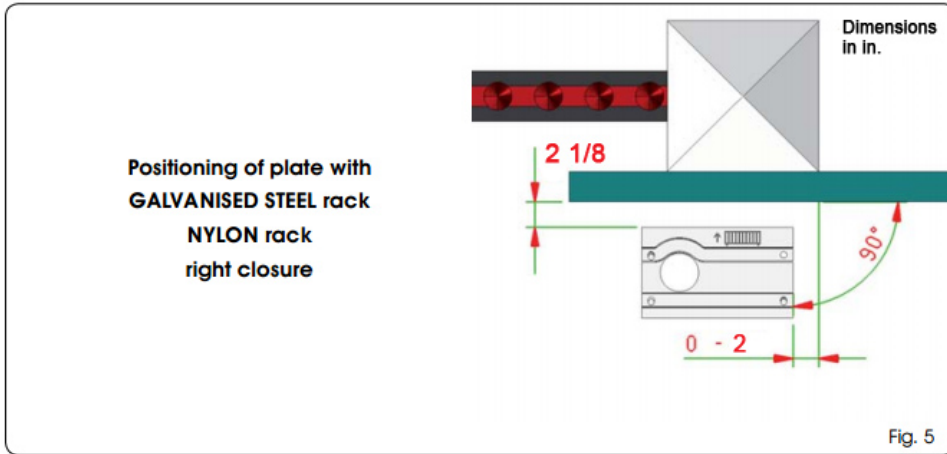
**5.1 PRELIMINARY CHECKS**

To ensure safety and an efficiently operating automated system, make sure the following conditions are observed:

- The gate structure must be suitable for automation. The following are necessary in particular: wheel diameter must be in proportion to the weight of the gate to be automated, an upper guide must be provided, plus mechanical limit switches to prevent the gate derailing.
- The gate slide track must be linear and horizontal.
- Manual movement of the gate must be easy throughout its travel.
- The soil must permit sufficient stability for the foundation plinth.
- There must be no pipes or electric cables in the plinth excavation area.
- If the gearmotor is exposed to passing vehicles, install, if possible, adequate means of protection against accidental impact.
- Check if an efficient earthing is available for connection to the gearmotor.
- If the elements checked do not meet the above requirements, arrange to ensure their compliance

**5.2 MASONRY FOR FOUNDATION PLATE**

1. Assemble the foundation plate as shown in Fig. 4.
2. The foundation plate must be located as shown in Fig. 5 (right closing) or Fig. 6 (left closing) to ensure the rack and pinion mesh correctly.



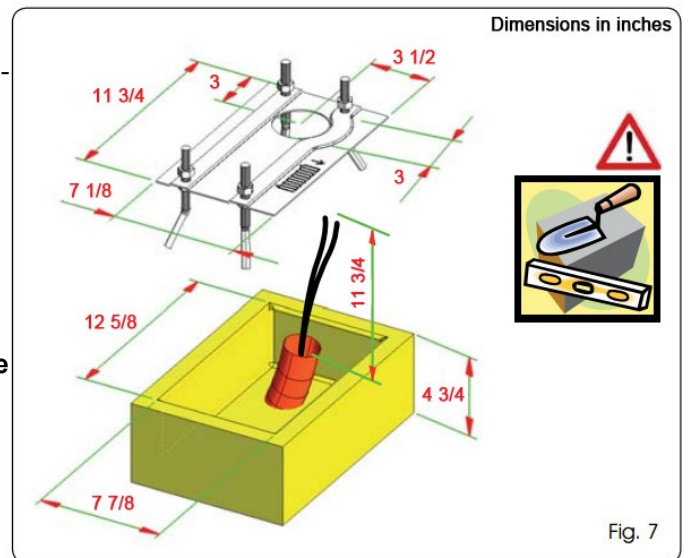
3. Prepare a foundation plinth as shown in Fig. 7 and wall in the foundation plate, supplying one or more sheaths for routing electric cables through the hole in the foundation plate.

**Using a spirit level, check if the plate is perfectly level.**

Wait for the cement to set.

4. Lay the electric cables for connection to the accessories and power supply as shown in Fig. 3.

**To facilitate the connections in the control unit, pull out the leads by at least 30 cm from the hole on the plate.**

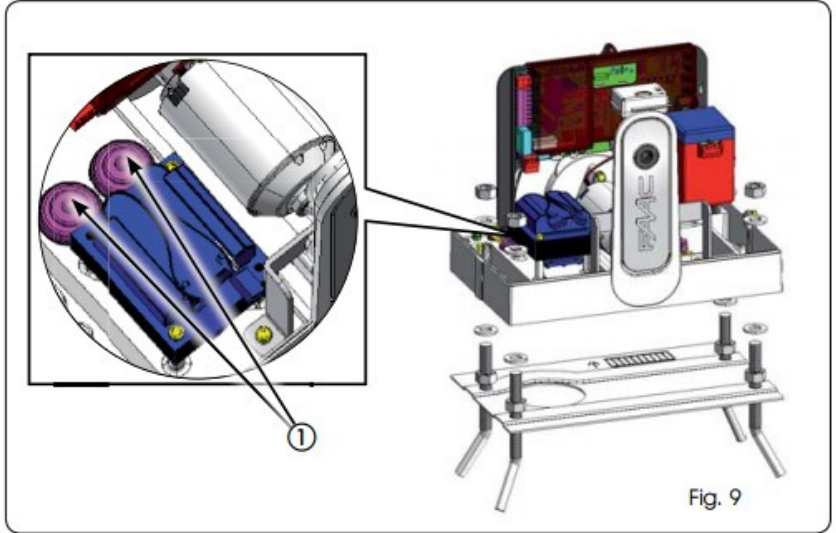
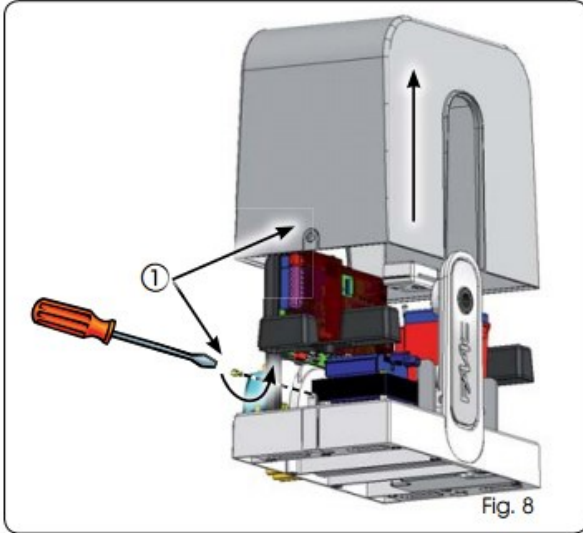




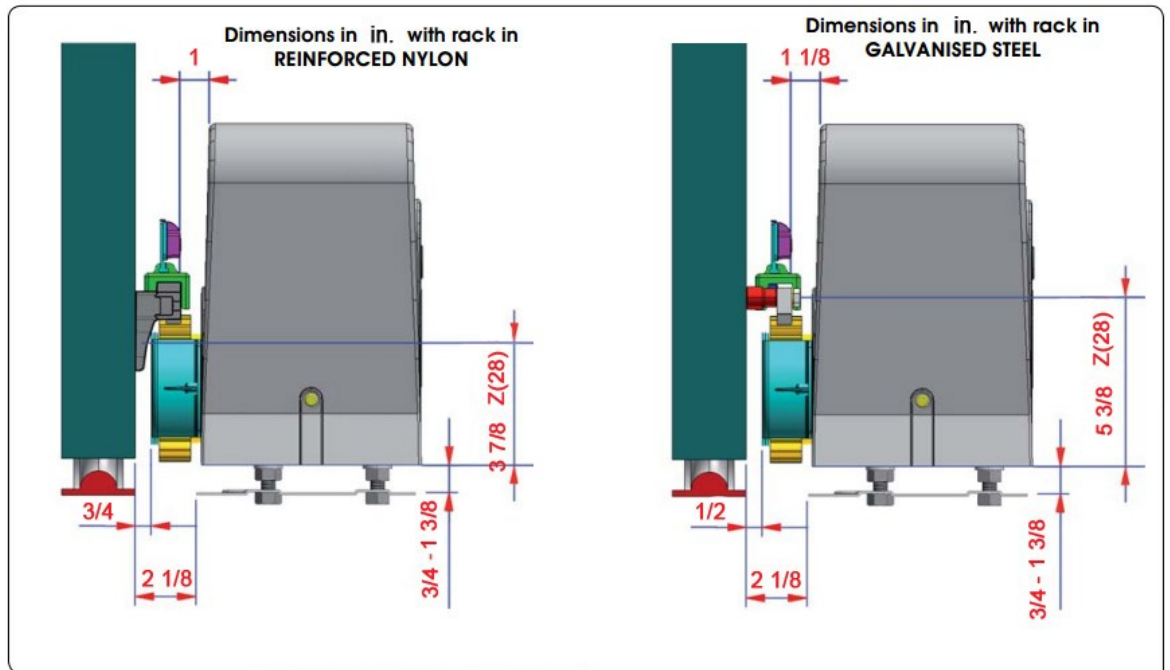
**5.3 MECHANICAL INSTALLATION**

1. Remove the cover casing by loosening the two suitable side bolts and lifting it (Fig. 8).
2. Position the operator on the foundation plate using the nuts and washers provided as shown in Fig. 9. During this operation, pass the cables through openings in the motor casing (see Fig. 9 re. 1).

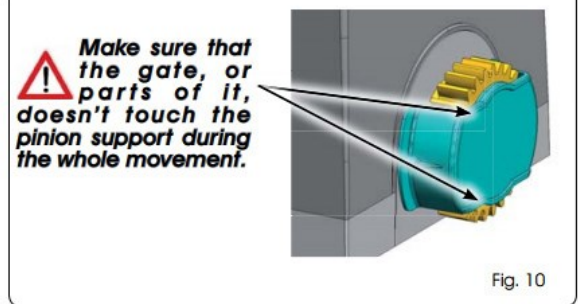
**Fig. 8 and Fig. 9 refer to operator C720 /E-SL1800**



3. Adjust the height of the gearmotor and the distance from the gate with reference to the dimensions in Fig. 10.  
**Operation required for correct fastening of the rack and to keep open the option of new adjustments.**



4. Secure the gearmotor to the plate by tightening the fastening nuts.
5. Prepare the gearmotor for manual operating mode as described in paragraph 8.



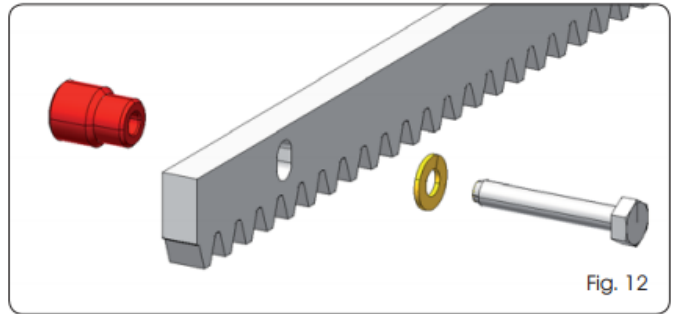
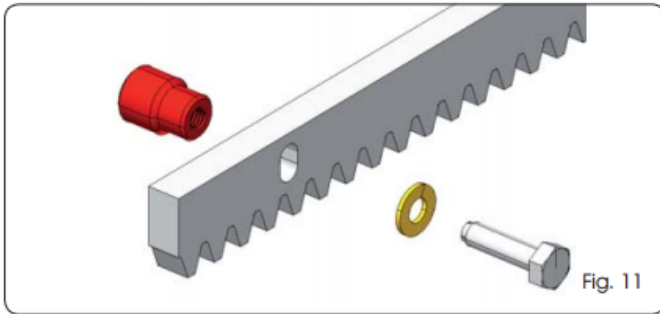
**5.4 INSTALLING THE RACK**

**5.4.1 STEEL RACK TO WELD (Fig.11)**

1. Place the three threaded pawls on the rack element, positioning them at the top of the slot. In this way, the slot play will enable any adjustments to be made.
2. Manually take the leaf into its closing position.
3. Lay the first piece of rack level on the pinion and weld the threaded pawl on the gate as shown in Fig. 14.
4. Move the gate manually, checking if the rack is resting on the pinion, and weld the second and third pawls.
5. Bring another rack element near to the previous one, using a piece of rack (as shown in Fig. 15), to synchronize the teeth of the two elements.
6. Move the gate manually and weld the three threaded pawls, thus proceeding until the gate is fully covered.

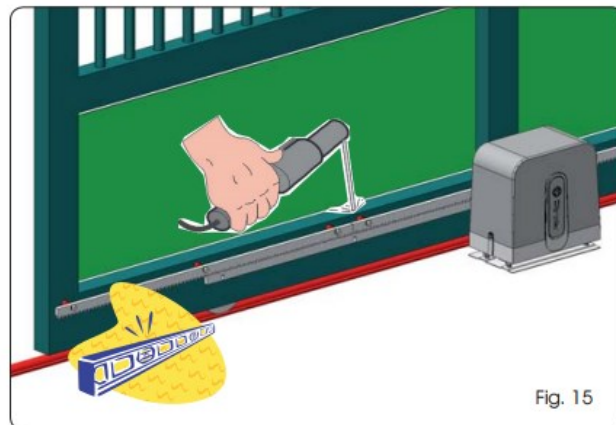
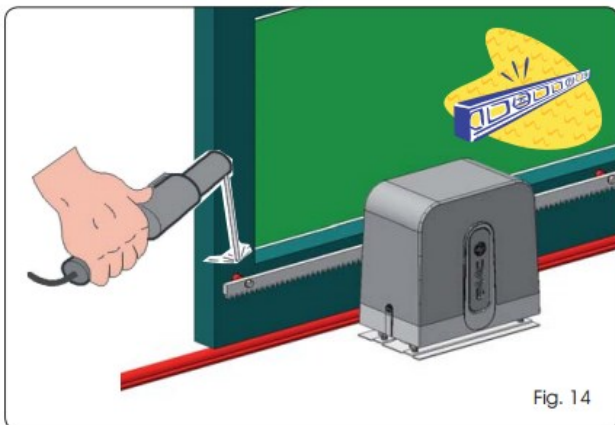
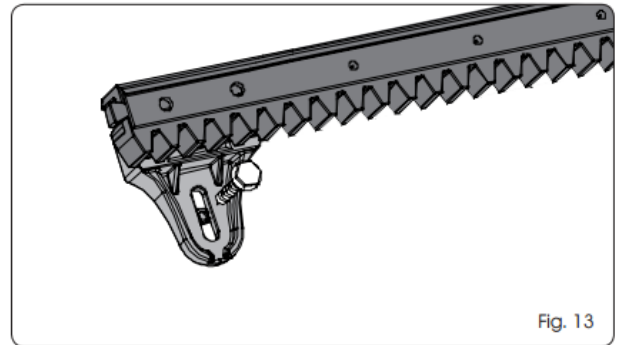
**5.4.2 STEEL RACK TO SCREW (Fig. 12)**

1. Manually take the leaf into its closing position.
2. Lay the first piece of rack level on the pinion and place the spacer between the rack and the gate, positioning it at the top of the slot. In this way, the slot play will enable any adjustments to be made.
3. Mark the drilling point on the gate. Drill a 1/4 in. hole and apply thread with a 3/8 in. male tap. Screw the bolt.
4. Move the gate manually, checking if the rack is resting on the pinion, and repeat the operations at point 3.
5. Bring another rack element near to the previous one, using a piece of rack (as shown in figure 15) to synchronize the teeth of the two elements.
6. Move the gate manually and carry out the securing operations as or the first element, thus proceeding until the gate is fully covered.



**5.4.3 NYLON RACK TO SCREW (Fig. 13)**

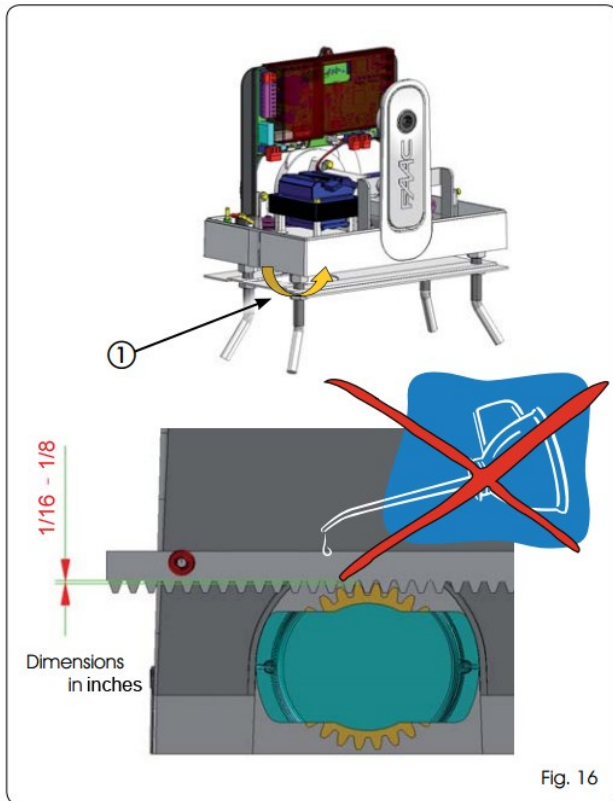
1. Manually take the leaf into its closing position.
2. Lay the first piece of the rack level on the pinion and mark the drilling point on the gate; drill 1/4 in. and screw in the self-tapping screw provided with its reinforcing plate.
3. Move the gate manually, checking if the rack is resting on the pinion, and repeat the operations at point 2.
4. Couple another rack element and fit to the previous element.
5. Move the gate manually and carry out the securing operations as for the first element, thus proceeding until the gate is fully covered.





**Important notes on rack installation:**

- Make sure that, during the gate travel, all the rack elements do not exit the pinion.
- Do not, on any account, weld the rack elements either to the spacers or to each other.
- When the rack has been installed, to ensure it meshes correctly with the pinion, we advise you to lower the gearmotor position by about 1/16 - 1/8 in. by adjusting the nuts (Fig.16 re. 1).
- Do not use grease or other lubricants between rack and pinion (Fig. 16)
- Manually check if the gate regularly reaches the mechanical limit switches and make sure there is no friction during gate travel.



**6 OPERATIONAL START-UP**

**6.1 ELECTRONIC BOARD CONNECTION**

**Before attempting any work on the control board (connections, programming, maintenance), always turn off power.**



- Observe points 10, 11, 12, 13, 14 of the **GENERAL SAFETY OBLIGATIONS.**
- Follow the instructions in Fig. 3 to arrange the cables in the ducts and make the electrical connections with the selected accessories.
- Always separate power cables from control and safety cables (push-button, receiver, photocells, etc.).
- Use separate sheaths in order to avoid any electrical interference.

**6.1.1 EARTHING**

Connect the earth cable as described in Fig.17.

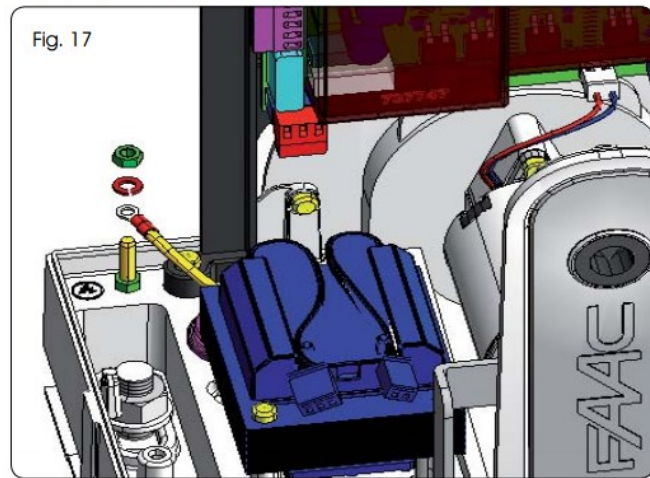
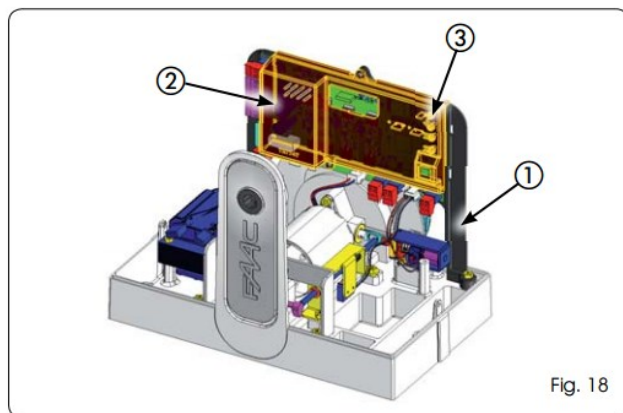


Fig. 17 refers to operator C720 /E-SL 1800

**6.1.2 ELECTRONIC EQUIPMENT**

The electronic control equipment in the gearmotors is fastened to a mount (Fig. 18 re. 1) with a clear cover (Fig. 18 re. 2). The board programming buttons are positioned on the cover (Fig.18 re. 3) and this makes it possible to program the board without having to remove the cover.

**To connect and program the control unit correctly, observe the specific instructions.**



**6.2 POSITIONING OF LIMIT SWITCHES**

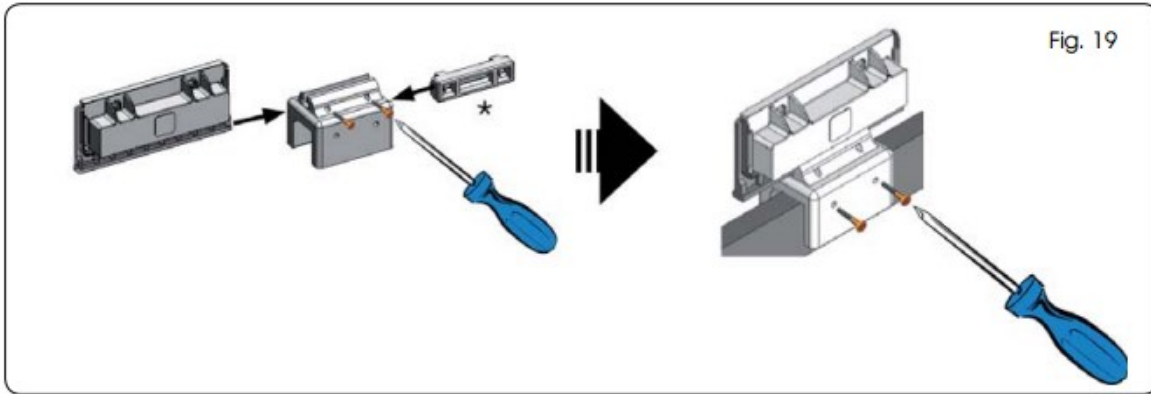
To ensure correct positioning of the limit switch magnets, the control unit must be installed and correctly connected with all control and safety accessories .

The operator is equipped with a magnetic limit switch sensor built directly into the electronic control board.

The gate is stopped, during opening or closure, at the moment when the polarized magnet secured to the upper part of the rack activates the sensor.

Assemble both magnets as shown in Fig. 19.

Prepare the operator for manual operating mode as described in chapter 8 and power the system.



To position the limit switch on the rack, refer to the electronic equipment instructions.

To avoid damage to the operator and/or interruptions in the operation of the automated system, approximately 1 5/8 in. must be left from the mechanical limit switches.

**7 TESTING THE AUTOMATED SYSTEM**

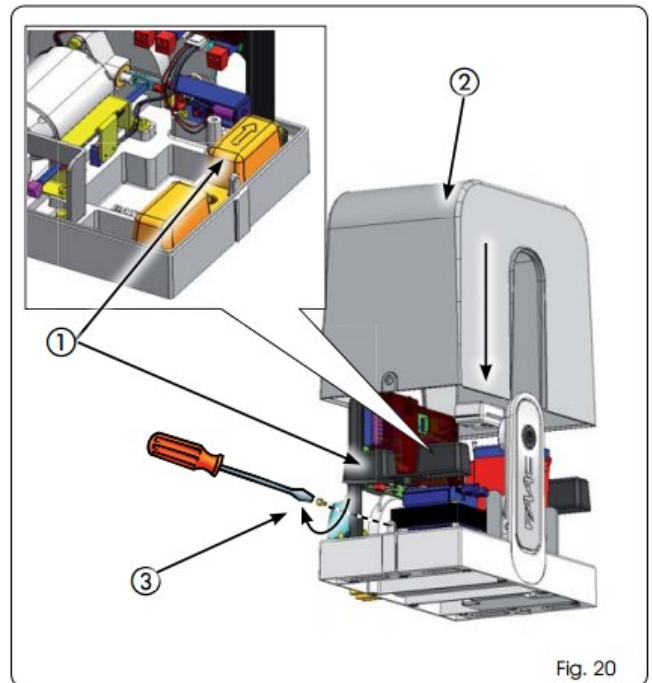
- Once the operator has been installed, carry out a thorough operational check of all accessories and connected safety devices.
- Press-fit the plastic covers of the operator fastening bolts, ensuring that the arrow is facing the gate (Fig. 20 re. 1), insert the cover casing (Fig. 20 re. 2) and fasten it by the two suitable side bolts (Fig. 20 re. 3).
- Give the Customer the "User Guide" and explain the correct operation and use of the gearmotor, highlighting potential high-risk areas of the automated system.

**8 OPERATOR RELEASE/LOCK**

During the release/lock manoeuvre, take care to prevent an involuntary pulse from operating the gate.

Proceed as follows to release the gearmotor:

1. Turn the release clockwise as shown in Fig. 21 re. 1. The release lever will move slightly away from the operator body (Fig. 21 re. 2)
2. Fully lower the release lever to the mechanical stop Fig. 21 re. 3.
3. Carry out the opening or closing manoeuvre manually.



Proceed as follows to lock the gearmotor:

1. Fully raise the release lever to the mechanical stop, Fig. 22 re. 1.
2. Turn the release anticlockwise as shown in Fig. 22 re. 2.

**To maintain the operator intact, avoid pulsing the gate to operate before resetting the lock system.**

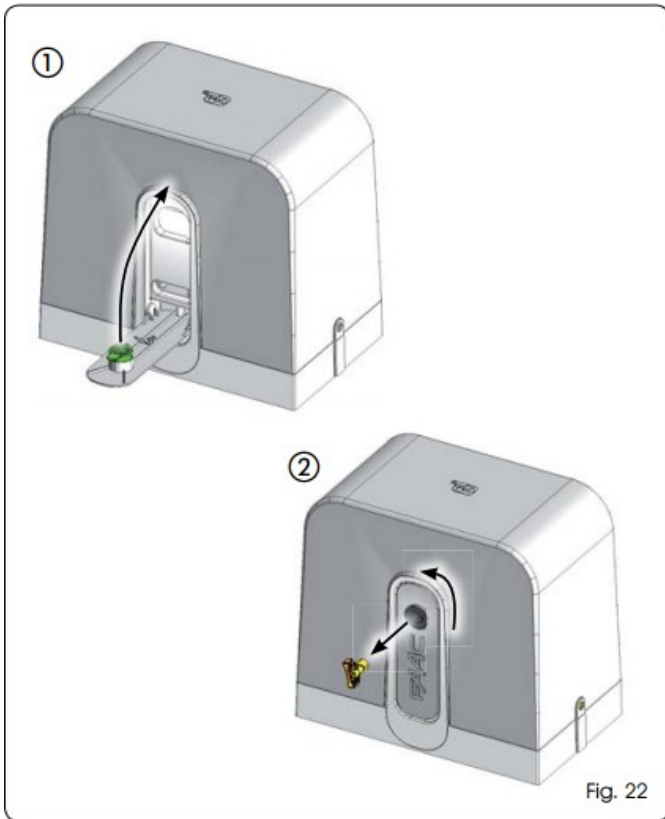


Fig. 22

Lowering the release lever, both the motor lock, which is retracted (Fig. 23 re. 1), and the safety micro switch forcing the automation to STOP (Fig. 23 re. 2) are operated.

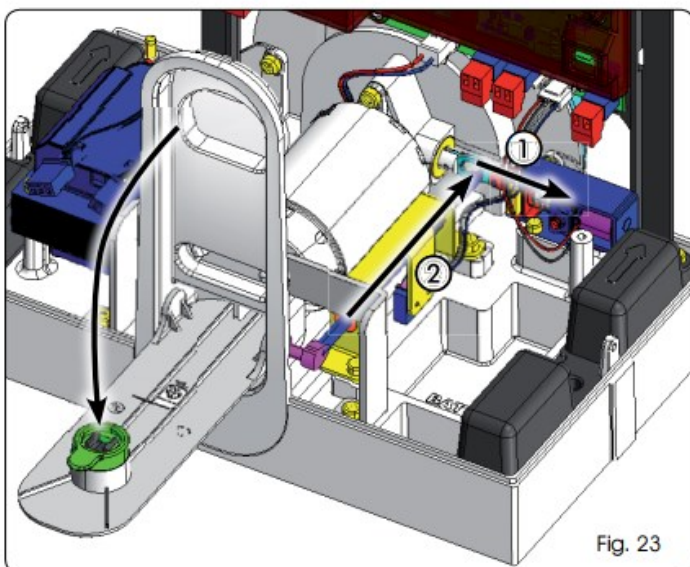


Fig. 23

## 9 MAINTENANCE

It is advisable to check the efficiency of the system at least every 6 months, particularly the efficiency of the safety devices (including the motor thrust force, which must comply with current standards) and of the release devices.

## 10 REPAIR

Contact an authorized Repair Centre for repairs.

## 11 ACCESSORIES

### 11.1 BATTERY KIT

Install the battery kit as shown in Fig. 24, inserting it in its seat and securing with screw re. 1. Connect it to the appropriate connector on the board (see relevant instructions).

Refer to the specific instructions for all information on the battery kit.

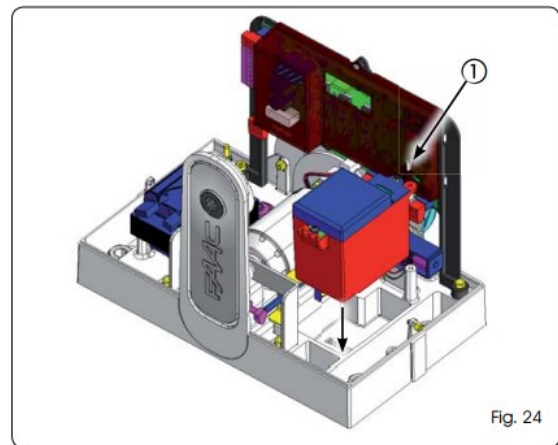


Fig. 24

### 11.2 RADIO MODULE

Install the radio module as shown in Fig. 25.

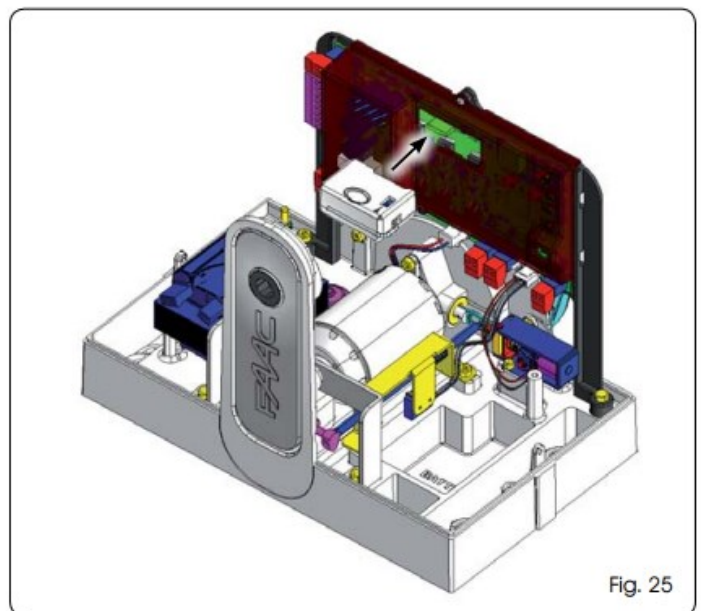


Fig. 25





**Read the instructions carefully before using the product and keep for any future needs.**

#### GENERAL SAFETY REGULATIONS

The C720 / 1800 and C721 automated systems, if correctly installed and used, guarantee a high level of safety.

Obeying some simple rules can also prevent accidental problems:

Do not allow children or adults to stay near the automated system, particularly avoid it while it is operating.

Keep radiocontrols or other pulse generators away from children, to prevent the automated system from being activated involuntarily.

Do not allow children to play with the automated system.

Do not forcibly restrain the gate's movement.

Prevent branches or shrubs from interfering with gate movement.

Keep the illuminated signalling systems efficient and very visible.

Do not attempt to operate the gate by hand until it has been released.

In the event of malfunction, release the gate to allow access and wait for qualified technical personnel to repair it.

Once manual operating mode has been set, turn off the power supply to the system before restoring normal operation.

Do not in any way modify the components of the automated system.

The user must not attempt any kind of repair or direct action whatever and contact qualified personnel only.

Ensure the efficiency of the automated device, the safety devices and the earth connection are checked at least every six months by qualified personnel.

#### DESCRIPTION

The C720 / 1800 and C721 automated systems are ideal for controlling vehicle access areas with average transit frequency.

The C720 / 1800 and C721 automated systems for sliding gates are electromechanical operators that transmit the motion to the sliding leaf using a rack and pinion.

The operation of the sliding gate is managed by an electronic control device housed inside the operator or in a watertight outdoor container.

When the device receives an opening command via a radiocontrol or any other suitable device with the gate closed, it operates the motor until the gate reaches its open position.

If automatic operation has been selected, the gate re-closes by itself after the selected pause time.

If semi-automatic operating mode has been selected, a second pulse must be sent to re-close the gate.

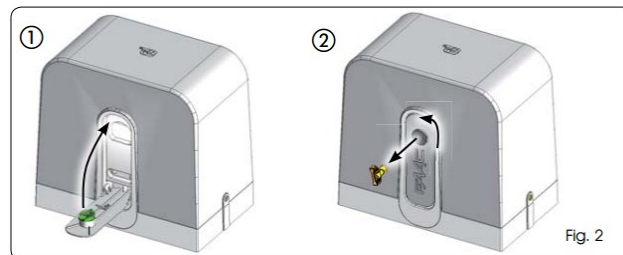
An opening pulse issued during the re-closing stage always causes a reversal of motion.

A stop pulse (if applicable) always stops motion.

The warning light indicates the current gate movement.

For the detailed behaviour of the sliding gate during the various operating modes, consult the installing technician.

The automated systems contain obstacle detection and/or safety devices (photocells, edges) that prevent the gate closing when an obstacle is located in the scanned area.



The system ensures the gate is mechanically locked when the motor is not operating and no lock therefore needs to be installed.

Manual opening is therefore only possible if the appropriate release system is operated.

The gearmotor is equipped with a device with electronic anticrushing system that offers the necessary safety if the gate should strike an obstacle during its motion by causing it to reverse direction immediately.

A handy manual release makes it possible to move the gate in the event of a power cut (if no back-up batteries are installed) or malfunction.

#### MANUAL OPERATION

During the release/lock manoeuvre, take care to prevent an involuntary pulse from operating the gate.

Proceed as follows to release the gearmotor:

Turn the release clockwise as shown in Fig. 1 re. 1. The release lever will move slightly away from the operator body (Fig. 1 re. 2)

Fully lower the release lever to the mechanical stop Fig. 1 re. 3.

Carry out the opening or closing manoeuvre manually.

#### RESTORING NORMAL OPERATION

Proceed as follows to lock the gearmotor:

Fully raise the release lever to the mechanical stop, Fig. 2 re. 1.

Turn the release anticlockwise as shown in Fig. 2 re. 2.

To maintain the operator intact, avoid pulsing the gate to operate before resetting the release system.

#### MAINTENANCE

It is advisable to check the efficiency of the system at least every 6 months, particularly the efficiency of the safety devices (including the motor thrust force, which must comply with current standards) and of the release devices.

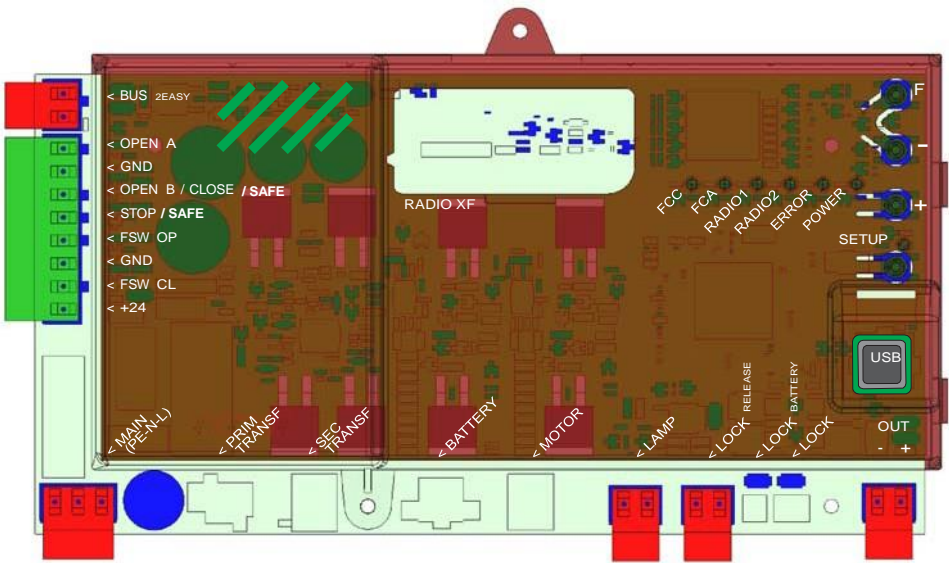
#### REPAIRS

Contact an authorized Repair Centre for repairs.

#### AVAILABLE ACCESSORIES

Refer to the catalogue for the available accessories.

# E720



*Estate* SWING

FAAC



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### EC DECLARATION OF CONFORMITY

**Manufacturer:** FAAC S.p.A.  
**Address:** Via Calari, 10 - 40069 Zola Predosa BOLOGNA - ITALY  
**Declares that:** Electronic device E720

- conforms to the essential safety requirements of the following EEC directives

2006/95/EC Low Voltage Directive  
 2004/108/EC Electromagnetic Compatibility Directive



Additional note:  
 This product has undergone testing in a typical standard configuration (all products built by FAAC S.p.A.)

Bologna, 01-05-2010

The Managing Director  
 A. Marcellan



### WARNINGS

- Attention! To ensure the safety of people, it is important that you read all the following instructions.
- Incorrect installation or incorrect use of the product could cause serious harm to people.
- Carefully read the instructions before beginning to install the product and keep for future reference.
- The symbol  highlights notes that are important for personal safety and the protection of the automated system.
- The symbol  calls your attention to notes on product specifications or operation.


# E720

## 1 WARNINGS

 Before attempting any work on the electronic device (connections, maintenance), always turn off power.

 Install, upstream of the system, a differential thermal breaker with adequate tripping threshold.

 Connect the earth lead to the appropriate terminal.

 Always separate power cables from control and safety cables (push-button, receiver, photocells, etc.). To avoid any electric noise, use separate sheaths or a shielded cable (with earthed shield).



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## 2 LAYOUT AND COMPONENTS

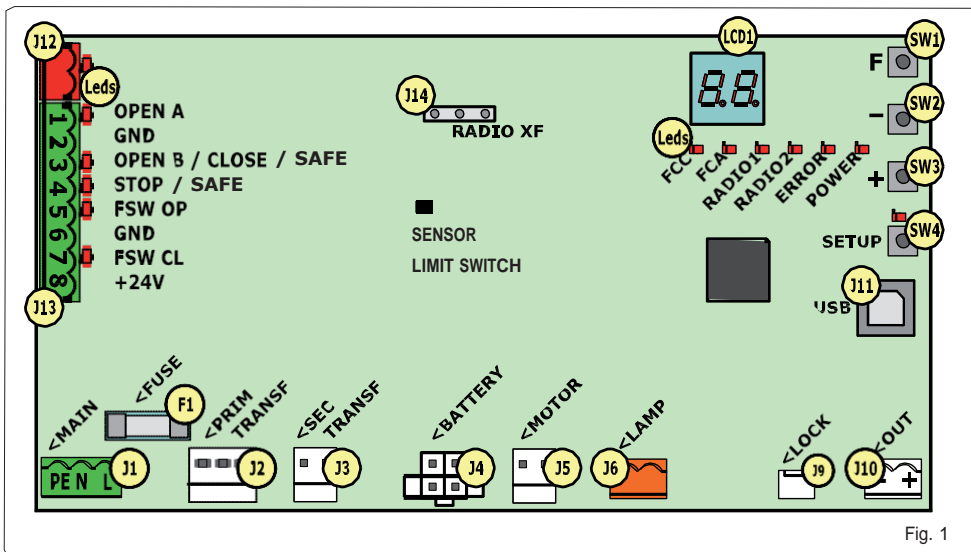


Fig. 1

### 2.1 COMPONENT DESCRIPTION


LCD	SIGNALLING AND PROGRAMMING DISPLAY
SW1	PROGRAMMING PUSH-BUTTON "F".
SW2	PROGRAMMING PUSH-BUTTON "-".
SW3	PROGRAMMING PUSH-BUTTON "+".
SW4	"SETUP" PUSH-BUTTON
Leds	INPUTS STATUS CONTROL LED
J1	MAIN POWER SUPPLY CONNECTOR
J2	TRANSFORMER PRIMARY WINDING CONNECTOR
J3	TRANSFORMER SECONDARY WINDING CONNECTOR
J4	EMERGENCY BATTERY CONNECTOR (ACCESSORY)
J5	MOTOR CONNECTOR
J6	FLASHER OUTPUT CONNECTOR
J9	MOTOR LOCK AND MOTOR RELEASE CONTACT CONNECTOR
J10	OUT OUTPUT CONNECTOR
J11	USB CONNECTOR FOR PC CONNECTION
J12	BUS-2EASY DEVICE CONNECTION CONNECTOR
J13	INPUT CONNECTOR IN CONNECTOR BLOCK
J14	RADIO RECEIVER MODULE CONNECTOR FOR OMNIDEC
LCD1	SIGNALLING AND PROGRAMMING DISPLAY
F1	PROTECTION FUSE

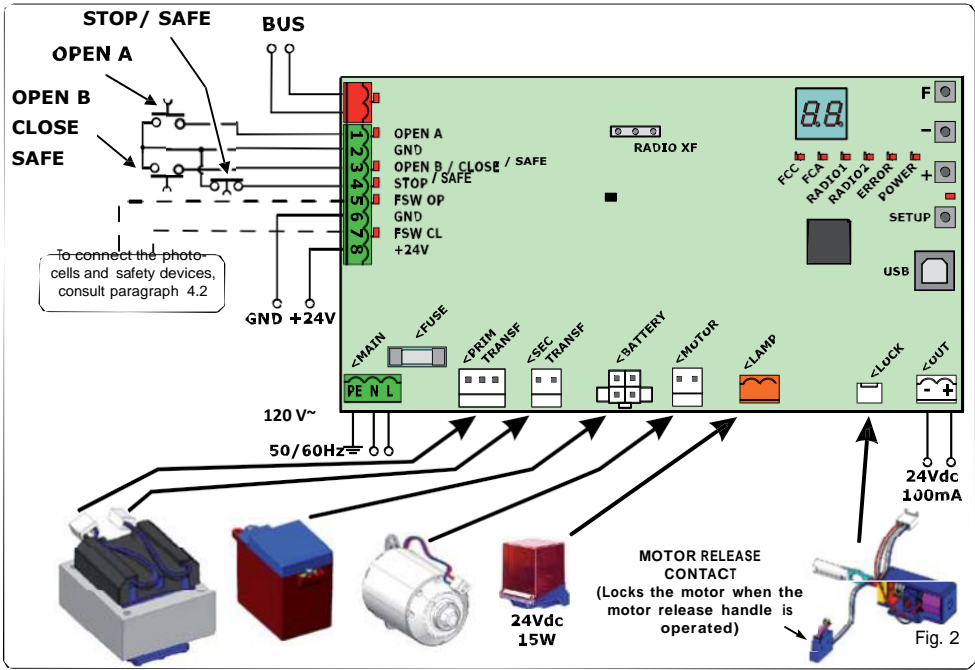
### 2.2 DESCRIPTION OF TERMINAL BLOCK J13

INPUT	No	DESCRIPTION
1	OPEN A	Device with <b>N.O.</b> contact that causes total opening of the gate
2-6	GND	Accessory power supply negative
3	OPEN B / CLOSE / SAFE	Device with <b>N.O.</b> contact that causes partial opening of the gate or reclosing of the gate according to the selected function logic
4	STOP / SAFE	Device with <b>N.C.</b> contact that halts the gate
5	FSW OP	Device with <b>N.C</b> contact that reverses the motion during gate opening
7	FSW CL	Device with <b>N.C</b> contact that reverses the motion during gate closing
8	+24 V	Accessory power supply positive

### 3 TECHNICAL SPECIFICATIONS

<b>Power supply</b>	120 V~ 50 Hz
<b>Power consumption from mains stand-by</b>	10 W
<b>Motor max. load</b>	6 A
<b>Accessory power supply</b>	24 Vdc
<b>Accessory max. current</b>	24 Vdc max. 500 mA BUS-2EASY max. 500 mA
<b>Environmental temperature</b>	(-20 - +55) °C
<b>Flasher load</b>	24 Vdc - 15 W
<b>Output load</b>	24 Vdc - 100 mA (1)
<b>Protection fuses</b>	F1 = T1A - 250V
<b>Function logics</b>	Semiautomatic, Semiautomatic "step", Automatic, Automatic "step", Automatic with timer function, Automatic Safety devices, Automatic Safety devices "step", Automatic with reverse on pause, Semiautomatic "b", Mixed logic "bC", Dead-man.
<b>Work time</b>	Programmable (from 0 to 10 min.)
<b>Pause time OPEN A / OPEN B</b>	Programmable (from 0 to 10 min.)
<b>Motor power</b>	Adjustable over 50 levels
<b>Opening-closing motor speed</b>	Adjustable over 10 levels
<b>Connector Inputs/Outputs</b>	Power supply, Battery, Motor, Module XF433/868, Motor lock electric release batteries, Motor Lock, USB
<b>Inputs/Outputs in terminal block</b>	BUS-2EASY, OPEN A, OPEN B/CLOSE/SAFE, STOP/SAFE, GND, Opening and closing photocells, +24 V, Mains power supply, Flasher, Electric release motor lock, OUT
<b>Programming</b>	1 <sup>st</sup> and 2 <sup>nd</sup> level with 3 keys (+, -, F) and display.

 (1) **The output load must be considered as already included in the max. current available for the accessories**



- A: Photocells that operate during CLOSING
- B: Photocells that operate during OPENING
- C: Photocells that operate during OPENING and CLOSING

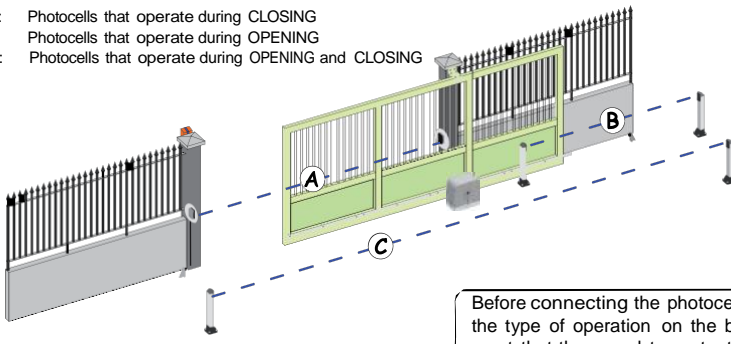


Fig. 3

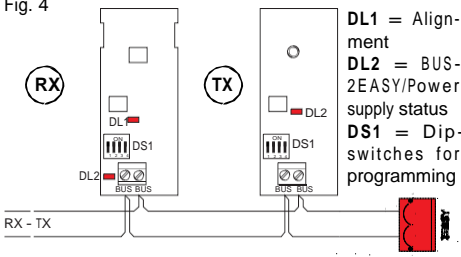
Before connecting the photocells, it is advisable to select the type of operation on the basis of the area of movement that they need to protect:

**Safety devices during closing:** operate only during the automated system closing movement and are therefore suitable for protecting the closing area from the risk of impact.

**Safety devices during opening:** operate only during the automated system opening movement and are therefore suitable for protecting the opening area from the risk of impact.

**Safety devices during opening/closing:** operate during both the automated system opening and closing movements and are therefore suitable for protecting the entire movement area from the risk of impact.

Fig. 4



**4.1 BUS-2EASY PHOTOCELLS**

This board is equipped with a BUS-2EASY circuit that can be used to easily connect a high number of auxiliary BUS-2EASY devices to the safety device (e.g. up to 16 pairs of photocells), appropriately programmed, using only two cables without polarity. Before connecting the photocells, it is advisable to select the type of operation (Fig. 3) on the basis of the area of movement the cells must protect and to position the dip switches on both the transmitter and receiver (see Fig. 4) as in Tab. 1.

**4.1.1 ADDRESSING BUS-2EASY PHOTOCELLS**

**It is important to give both the transmitter and the receiver the same address.**

**Ensure that there are not two or more photocell pairs with the same address.**

**If no BUS-2EASY accessory is used, leave the BUS-2EASY connector (J12 - fig. 1) free.**

**Tab. 1 - Addressing BUS-2EASY photocells**

Dip1	Dip2	Dip3	Dip4	Re.	Type
OFF	OFF	OFF	OFF	B	OPENING Max. 6 pairs
OFF	OFF	OFF	ON		
OFF	OFF	ON	OFF		
OFF	OFF	ON	ON		
OFF	ON	ON	OFF		
OFF	ON	ON	ON		
ON	OFF	OFF	OFF	A	CLOSING Max. 7 pairs
ON	OFF	OFF	ON		
ON	OFF	ON	OFF		
ON	OFF	ON	ON		
ON	ON	OFF	OFF		
ON	ON	ON	OFF		
OFF	ON	OFF	OFF	C	OPENING and CLOSING Max. 2 pairs
OFF	ON	OFF	ON		
ON	ON	ON	ON	/	OPEN PULSE

**4.1.2 STORING BUS-2EASY ACCESSORIES**

It is possible to add BUS-2EASY photocells to the system at any time, simply by following the procedure below:

1. Install and programme the accessories with the required address (see par. 4.1.1).
2. Cut off power to the board.
3. Connect both cables of the BUS-2EASY accessories to the red terminal block J12 (polarity irrelevant).
4. Power the board.
5. Quickly press the SETUP push-button (SW4) once to register the accessories. Check the operation of the installed BUS-2EASY devices.
6. The board has stored the BUS-2EASY accessories.

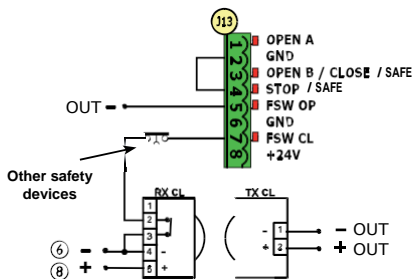
Follow the instructions in the following table to check that the BUS-2EASY connection status is efficient.

**Tab. 2 - Description of BUS-2EASY led**

<b>Fixed ON</b>	Normal activity (led on even without photocells). No registered photocell engaged.
<b>Slow flasher</b>	At least one registered photocell engaged or not aligned.
<b>Off (flash every 2.5 secs)</b>	BUS-2EASY line short-circuited.
<b>Off</b>	BUS-2EASY line deactivated.

**4.2 TRADITIONAL PHOTOCELLS**

Connection of 1 pair of closing photocells with FAIL-SAFE safety device **activated**  
Set in second level of programming  
**01 = 01**



Connection of 1 pair of closing photocells with FAIL-SAFE and STOP safety device **deactivated**

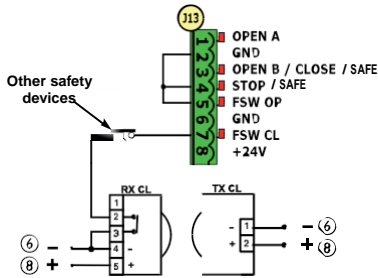


Fig. 5

**If the FAIL-SAFE safety device is not used, connect the power supply of the transmitters to terminals 6 and 8 of J13.**

**If the FAIL-SAFE safety device is used, connect the power supply of the transmitters to OUT after setting it as appropriate (see 2nd level programming and Fig. 16).**

**If the FAIL-SAFE safety device is used, even the unused safety inputs must be connected via a shunt lead to the negative of OUT (see Fig. 16).**

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Connection of a pair of opening photocells

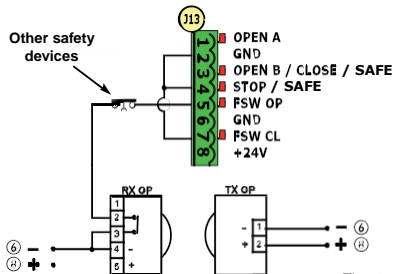


Fig. 6

Connection of a pair of closing photocells and a pair of opening/closing photocells

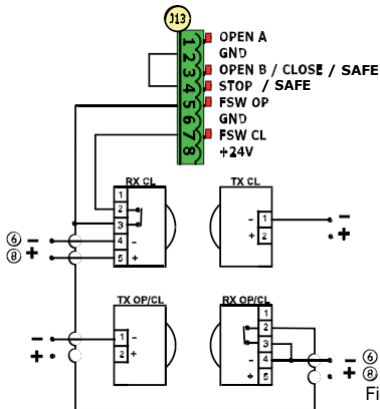


Fig. 9

Connection of a pair of closing photocells and a pair of opening photocells

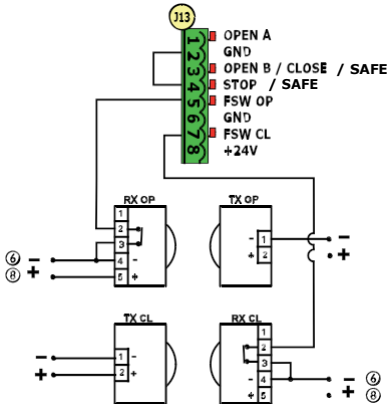


Fig. 7

Connection of a pair of closing photocells, a pair of opening photocells and a pair of opening/closing photocells

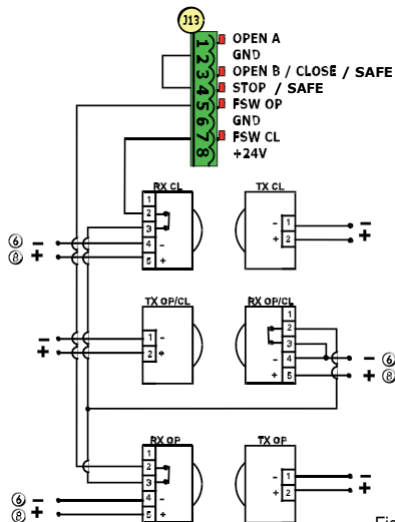


Fig. 10

Connection of two pairs of closing photocells

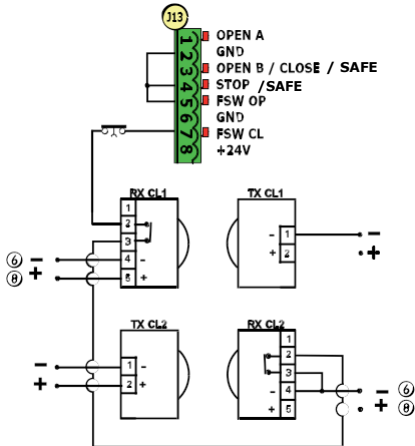


Fig. 8

Connection of no safety and stop device

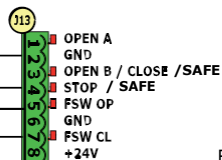


Fig. 11


## 5 PROGRAMMING


It is necessary to access PROGRAMMING mode in order to program automated system operation.


Programming is divided in two parts: 1<sup>st</sup> LEVEL and 2<sup>nd</sup> LEVEL.


 **The status of the automated system is**

**normally shown on the display. When push-button F is pressed or when F and + are pressed simultaneously, this gives access to 1<sup>st</sup> or 2<sup>nd</sup> level programming.**

 **To restore the default settings, simply re-load the desired default in the first passage of the 1<sup>st</sup> level programming.**

 **The change of the programming parameters becomes effective, while final storage will not take place until programming mode has been exited and the input status is again displayed. If power supply to the device is cut before going back to the input status display, all the changes made will be lost.**


 **It is possible to return to the input status display and store all the parameters modified to that moment from any point of the 1<sup>st</sup> and 2<sup>nd</sup> level programming by pressing keys F and - simultaneously.**

 **When the board is turned on, the software version of the board as two figures separated by a decimal point appears on the LCD1 display.**




### 5.1 1<sup>st</sup> LEVEL PROGRAMMING

To access 1<sup>st</sup> level programming, press push-button F.

- If you press key F again (and hold it down), the display shows the name of the function.
- If you release the key, the display shows the value of the function that can be modified with keys + and -.
- If you press F again (and hold it down), the display shows the name of the next function, etc.
- When you reach the last function, press push-button F to exit the program and store the parameters. The display shows again the status of the automated system.

1 <sup>st</sup> LEVEL PROGRAMMING 		
Display	Function	Default ↑
dF	<p><b>DEFAULT:</b></p> <p>↑ Configures the parameters with DEFAULT values.</p> <p>CU If push-button F is released, the value CU appears, this means that the standard modified configuration has been selected by means of push-buttons and display. If you wish to maintain this programming, press push-button F again, otherwise press + and select default ↑.</p>	↑
LO	<p><b>FUNCTION LOGICS:</b></p> <p>F Semiautomatic.</p> <p>EP Semiautomatic "Step".</p> <p>A Automatic.</p> <p>A1 Automatic1.</p> <p>AP Automatic "Step".</p> <p>At Automatic with timer function.</p> <p>S Automatic "Safety devices".</p> <p>SP Automatic Safety Devices "Step".</p> <p>SA Automatic with reverse during pause.</p> <p>b Semiautomatic "b".</p> <p>bC Mixed (AP pulse/ CH dead-man).</p> <p>C Dead-man.</p>	E
PA	<p><b>PAUSE TIME A:</b></p> <p>Pause time with a TOTAL opening command. This has effect only if the automatic logic was selected. Adjustable from 0 to 59 secs. in one-second steps.</p> <p>Subsequently, display changes to minutes and tens of seconds (separated by a point) and time is adjusted in 10-second steps, up to the maximum value of 9.5 minutes.</p> <p>E.g. if the display shows 2.5, pause time is 2 min. and 50 secs.</p>	20
Pb	<p><b>PAUSE TIME B:</b></p> <p>Pause time with a PARTIAL opening command. This has effect only if the automatic logic was selected. Adjustable from 0 to 59 secs. in one-second steps.</p> <p>Subsequently, display changes to minutes and tens of seconds (separated by a point) and time is adjusted in 10-second steps, up to the maximum value of 9.5 minutes.</p> <p>E.g. if the display shows 2.5, pause time is 2 min. and 50 secs.</p>	20


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Display	Function	Default <sup>1</sup>
<b>FO</b>	<p><b>MOTOR POWER:</b> Adjusts the motor power level</p> <p>01 = minimum power 50 = maximum power</p> <p> <b>When the power value has been changed, it is advisable to perform a new SETUP (see par. 7.3)</b></p>	<b>50</b>
<b>So</b>	<p><b>OPENING SPEED:</b> Adjusts the motor opening speed to 10 levels</p> <p>01 = minimum speed 10 = maximum speed</p> <p> <b>When the speed value has been changed, it is advisable to perform a new SETUP (see par. 7.3)</b></p>	<b>08</b>
<b>Sc</b>	<p><b>CLOSING SPEED:</b> Adjusts the motor closing speed to 10 levels.</p> <p>01 = minimum speed 10 = maximum speed</p> <p> <b>When the speed value has been changed, it is advisable to perform a new SETUP (see par. 7.3)</b></p>	<b>08</b>
<b>ro</b>	<p><b>SLOWING DURING OPENING</b> Adjusts the slowing space as a percentage of the total gate travel. Adjustable from 5 (with speed &lt;5), 10 (with speed between 5 and 8), 15 (with speed &gt;8) to 99 % in 1% steps.</p> <p>5-10-15 = minimum slowing 99 = maximum slowing</p>	<b>20</b>
<b>rc</b>	<p><b>SLOWING DURING CLOSING:</b> Adjusts the slowing space as a percentage of the total gate travel. Adjustable from 5 (with speed &lt;5), 10 (with speed between 5 and 8), 15 (with speed &gt;8) to 99 % in 1% steps.</p> <p>5-10-15 = minimum slowing 99 = maximum slowing</p>	<b>20</b>
<b>Sr</b>	<p><b>SPEED DURING SLOWING:</b> Adjusts gate speed during slowing.</p> <p>0 = LOW speed 1 = HIGH speed</p>	<b>0</b>
<b>St</b>	<p><b>STATUS OF AUTOMATED SYSTEM:</b> Exit from programming, data storage, and return to gate status display.</p> <p>00 = CLOSED 01 = OPEN 02 = Stop then "OPEN" 03 = Stop then "CLOSE" 04 = In "PAUSE" 05 = During opening stage 06 = During closing stage</p> <p>07 = FAIL SAFE in progress 08 = BUS-2EASY device check in progress 09 = Preflashing then "OPEN" 10 = Preflashing then "CLOSE" 11 = OPEN in Partial Opening 12 = in PAUSE Partial Opening</p>	

**5.2 2<sup>nd</sup> LEVEL PROGRAMMING**




To access 2ND LEVEL PROGRAMMING, press push-button F and hold down while pressing push-button +:

- if you also release push-button F, the display shows the value of the function that can be modified with keys + and -.
- if you press key F (and hold down), the display shows the name of the next function. If you release it, the value that can be modified with keys + and - is displayed.
- when you reach the last function, press F to exit programming, and the display resumes showing the automated system status.

2 <sup>nd</sup> LEVEL PROGRAMMING 		
Display	Function	Default <sup>↑</sup>
bo	<p><b>MAXIMUM TAKE-OFF POWER:</b> The motor works at maximum power (ignoring the selected power level) during the movement take-off.</p> <p>Y = active no = excluded</p>	no
PF	<p><b>PREFLASHING:</b> Allows 5 types of preflashing to be selected, with a duration equal to 3 secs.</p> <p>no = no preflashing. OC = preflashing before each movement. CL = preflashing before a closing movement. OP = preflashing before an opening movement. PA = preflashing only at end of pause.</p>	no
tP	<p><b>PREFLASHING TIME (visible only if preflashing is selected in the previous menu):</b> Adjusts preflashing time from 1 to 10 sec. in 1 second steps.</p> <p>01 = minimum preflashing 10 = maximum preflashing</p>	03
Ph	<p><b>CLOSING PHOTOCELLS:</b> Activate the function if you want the closing photocells to lock movement and reverse it on disengagement. Normally, operation of the closing photocells immediately puts the gate into reverse when this function is off.</p> <p>Y = reversal on disengagement no = immediate reversal to opening</p>	no
oP	<p><b>OPENING PHOTOCELLS:</b> Activate the function if you want the opening photocells to lock movement and reverse it during closing. Normally, with this function off, operation of the opening photocells determines the resumption of movement on their disengagement.</p> <p>no = immediate reversal to closing no = resumption of motion on disengagement</p>	no
Ad	<p><b>ADMAP FUNCTION</b> Permits activation of operation in accordance with French standard NFP 25/362.</p> <p>Y = active no = excluded</p>	no
EC	<p><b>ENCODER:</b> The "virtual" encoder on the board operates as an anti-crushing device and manages the slowing and partial opening start points. If the gate strikes an obstacle during the opening or closing stage, the "virtual" encoder causes reversal of the motion. The second obstacle detected in the same direction causes the motor to stop. An alarm is signalled in both cases (see section on alarms). It is necessary to adjust the sensitivity of the "virtual" encoder by varying the time that the board waits for before controlling reversal of motion from a minimum of 0 sec to a maximum of 10 sec in one-second steps.</p> <p>00 = maximum sensitivity 10 = minimum sensitivity</p>	02

Display	Function	Default <sup>1</sup>
PO	<p><b>PARTIAL OPENING:</b> It is possible to adjust the width of the partial leaf opening as a percentage of the total gate travel. Adjustable from 0 to 99% in 1% steps.</p> <p>00 = no partial opening 01 = minimum partial opening 99 = maximum partial opening</p>	50
t	<p><b>TIME-OUT</b> It is advisable to set a value higher than the time taken by the gate to open or close fully. Adjustable from 0 to 59 sec. in 1 second steps. Subsequently, display changes to minutes and tens of seconds (separated by a point) and time is adjusted in 10-second steps, up to the maximum value of 9.5 minutes. E.g.: if the display shows 2.5, pause time is 2 min. and 50 secs.</p>	2.0
01	<p><b>OUT 1:</b> Allows output OUT (open collector N.O.) to be activated in one of the following functions: 00 = Always active 01 = FAIL-SAFE 02 = WARNING LIGHT (off when closed, on during opening and open/pause, flashing during closing) 03 = COURTESY LIGHT (see next function) 04 = ALARM, BATTERY operation 05 = gate OPEN or PAUSED 06 = gate CLOSED 07 = gate in MOTION 08 = gate OPENING 09 = gate CLOSING 10 = ACTIVE safety 11 = timed output that can be activated by second radio channel (see next function) 12 = output that can be activated by second radio channel (step function)</p>	00
t1	<p><b>TIMING OF OUT 1 (only if option 03 or 11 is selected at the previous step):</b> Can be used to adjust timing of output OUT if a timed function was selected (e.g. 03 or 11) from 1 to 99 minutes in 1 minute steps.</p>	02
Ob	<p><b>OPEN B / CLOSE / EDGE SAFETY DEVICE:</b> It is possible to select the use of OPEN B input as partial opening, CLOSE command or EDGE SAFETY DEVICE.</p> <p>00 = OPEN B 01 = CLOSE 02 = EDGE SAFETY DEVICE</p> <p> <b>If you select a function logic that involves the use of the CLOSE command (logic b, bC, C) this function will be preset to 01 and it will not be possible to change it.</b></p>	00
SP	<p><b>STOP / EDGE SAFETY DEVICE</b> It is possible to select the use of STOP input as STOP or EDGE SAFETY DEVICE.</p> <p>00 = STOP 01 = EDGE SAFETY DEVICE</p>	00
Lc	<p><b>MOTOR LOCK:</b> It is possible to select the use of the motor lock during battery operation:</p> <p>Y = the motor lock continues to operate regularly even during battery operation no = when the system switches to battery operation, the motor lock remains open.</p>	Y



Display	Function	Default ↑														
<b>AS</b>	<p><b>SERVICE REQUEST - CYCLE COUNTER (combined with the two successive functions):</b></p> <p><b>Y</b> = when the set number of cycles is reached with successive functions <b>nc</b> and <b>nd</b>, the system carries out an 8 sec. preflashing sequence (in addition to the sequence already set using the <b>PF</b> function) before each movement.</p> <p><b>no</b> = successive functions <b>nc</b> and <b>nd</b> indicate how many cycles the system has performed up to the maximum possible display of 99.990.</p> <p> <b>If the number of cycles is higher than 99.990, the two successive functions nc and nd will show 99 and 99 respectively.</b></p> <p>This function may be useful for setting programmed maintenance operations or for checking work cycles performed.</p>	<b>no</b>														
<b>nc</b>	<p><b>CYCLE PROGRAMMING (THOUSANDS):</b></p> <p>If <b>AS = Y</b> the display indicates the number of thousands of cycles after which service is required (may be set from <b>0</b> to <b>99</b>).</p> <p>If <b>AS = no</b> the display indicates the number of thousands of cycles performed. The value displayed is updated with the sequence of cycles, interacting with the value of <b>nd</b>.</p> <p> <b>If AS = no press keys + and - for 5 sec. to zero the cycle counter.</b></p>	<b>00</b>														
<b>nd</b>	<p><b>CYCLE PROGRAMMING (TENS):</b></p> <p>If <b>AS = Y</b> the display indicates the number of tens of cycles after which service is required (may be set from <b>0</b> to <b>99</b>).</p> <p>If <b>AS = no</b> the display indicates the number of tens of cycles performed. The value displayed is updated with the sequence of cycles, interacting with the value of <b>nc</b>.</p> <p> <b>Example: if the system has performed 11.218, it will display nc = 11 and nd = 21</b></p>	<b>00</b>														
<b>St</b>	<p><b>STATUS OF AUTOMATED SYSTEM:</b></p> <p>Exit from programming, data storage, and return to gate status display.</p> <table border="0"> <tr> <td><b>00</b> = CLOSED</td> <td><b>07</b> = FAIL SAFE in progress</td> </tr> <tr> <td><b>01</b> = OPEN</td> <td><b>08</b> = BUS-2EASY device check in progress</td> </tr> <tr> <td><b>02</b> = Stop then "OPEN"</td> <td><b>09</b> = Preflashing then "OPEN"</td> </tr> <tr> <td><b>03</b> = Stop then "CLOSE"</td> <td><b>10</b> = Preflashing then "CLOSE"</td> </tr> <tr> <td><b>04</b> = In "PAUSE"</td> <td><b>11</b> = OPEN in Partial Opening</td> </tr> <tr> <td><b>05</b> = During opening stage</td> <td><b>12</b> = in PAUSE Partial Opening</td> </tr> <tr> <td><b>06</b> = During closing stage</td> <td></td> </tr> </table>	<b>00</b> = CLOSED	<b>07</b> = FAIL SAFE in progress	<b>01</b> = OPEN	<b>08</b> = BUS-2EASY device check in progress	<b>02</b> = Stop then "OPEN"	<b>09</b> = Preflashing then "OPEN"	<b>03</b> = Stop then "CLOSE"	<b>10</b> = Preflashing then "CLOSE"	<b>04</b> = In "PAUSE"	<b>11</b> = OPEN in Partial Opening	<b>05</b> = During opening stage	<b>12</b> = in PAUSE Partial Opening	<b>06</b> = During closing stage		
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<b>05</b> = During opening stage	<b>12</b> = in PAUSE Partial Opening															
<b>06</b> = During closing stage																

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## 6 STORING RADIO CODE

The electronic device is equipped with an integrated dual channel decoding system (DS, SLH, LC/RC) known as OMNIDEC. This system can use an additional receiving module (Fig. 5 re. G) and radiocontrols

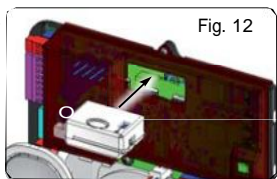





Fig. 12

of the same frequency to store both total opening (OPEN A) and partial opening (OPEN B) of the automated system.

 **The 3 types of radio coding (DS, SLH, LC/RC) can co-exist at the same time on the two channels. It is possible to enter up to 256 radio codes subdivided between OPEN A and OPEN B.**

 **To use the different coding systems on the same channel, finish the learning process for each system and then repeat the procedure for another.**


### 6.1 STORING DS RADIOCONTROLS

 **It is possible to store a maximum of 256 codes divided between OPEN A and OPEN B/CLOSE.**


- On the DS radiocontrol, select the required ON - OFF combination of the 12 dip-switches.
- Press and hold down push-button + (SW3) or - (SW2) and then press the SETUP push-button (SW4), to store total opening (OPEN A) or partial opening (OPEN B/CLOSE) respectively. The corresponding led will begin to flash slowly for 5 secs.
- Release both push-buttons.
- Within this 5 second period, press the required push-button on the radiocontrol.
- The corresponding led will come on with a fixed light for 1 second and then go off to indicate the setting has been stored.
- To add other codes other than the one you have recently stored, repeat the procedure from point 1.

- To use radiocontrols with the same code, copy the ON - OFF combination to the other radiocontrols without the need to change anything on the control board.

### 6.2 STORING SLH RADIOCONTROLS


 **It is possible to store a maximum of 256 codes divided between OPEN A and OPEN B/CLOSE.**

- On the SLH radiocontrol, press and hold down P1 and P2 simultaneously.
- The radiocontrol led will begin to flash.
- Release both push-buttons.
- Press and hold down push-button + (SW3) or - (SW2) and then press the SETUP push-button (SW4), to store total opening (OPEN A) or partial opening (OPEN B/ CLOSE) respectively. The corresponding led will begin to flash slowly for 5 secs.
- Release both push-buttons.
- Within this 5 sec. period while the radiocontrol led is still flashing, press and hold down the required push-button on the radiocontrol (the radiocontrol led will come on with a fixed light).
- The corresponding led will come on with a fixed light for 2 seconds and then go off to indicate the setting has been stored.
- Release the radiocontrol push-button.
- Press the stored radiocontrol push-button twice in quick succession.

 **The automated system will carry out an opening control. Ensure the automated device is free of any obstacle by people or things.**


To enable other radiocontrols with the same system code, transfer the system code of the stored radiocontrol push-button to the corresponding push-button of the radiocontrols to be added, following the procedure below:

- On the stored radiocontrol, press and hold down P1 and P2 simultaneously.
- The radiocontrol led will begin to flash.
- Release both push-buttons.
- Press the stored push-button and hold down (the radiocontrol led will come on with a fixed light).
- Bring the radiocontrols closer to one another, press and hold down the corresponding push-button of the radiocontrol to be added, releasing only once the led on the radiocontrol has issued a double flash to indicate that it has been stored.
- Press the stored radiocontrol push-button twice in quick succession.

 **The automated system will carry out an opening control. Ensure the automated device is free of any obstacle by people or things.**

### 6.3 STORING LC/RC RADIOCONTROLS

**(ONLY FOR SOME MARKETS)**

 **It is possible to store a maximum of 256 codes divided between OPEN A and OPEN B/CLOSE.**

 **Use the LC/RC remote controls only with a 433 MHz receiving module.**

- Press and hold down push-button + (SW3) or - (SW2) and then press the SETUP push-button (SW4), to store total opening (OPEN A) or partial opening (OPEN B/ CLOSE) respectively. The corresponding led will begin to flash slowly for 5 secs.
- Release the push-button.
- Within this 5 second period, press the required push-button on the LC/RC remote control.
- The led will come on with a fixed light for 1 second, indicating that the unit has been stored, and then resume flashing for an additional 5 seconds during which time another radiocontrol may be stored.
- Once the 5 seconds are up, the led will go off to indicate that the procedure is complete.

#### 6.3.1 STORING LC/RC RADIOCONTROLS REMOTELY


With LC/RC radiocontrols, other radiocontrols may be stored in remote mode, i.e. without operating directly on the board, using a previously stored radiocontrol.

- Obtain a radiocontrol already stored on one of its 2 channels (OPEN A or OPEN B/CLOSE).
- Press and hold down push-buttons P1 and P2 simultaneously until both leds flash slowly for 5 secs.
- Within 5 seconds, push the previously stored radiocontrol push-button to activate the learning stage on the selected channel.
- The led on the board corresponding to the channel being stored flashes for 5 seconds, within which time the code of another radiocontrol must be sent.
- The led will come on with a fixed light for 1 second, indicating that the unit has been stored, and then resume flashing for an additional 5 seconds during which time other radiocontrols may be stored and then it will go off.

#### 6.4 RADIOCONTROLS DELETION PROCEDURE

To delete ALL the codes of the radiocontrols entered, simply press down together the two push-buttons + (SW3) and - (SW2), then press the SETUP push-button (SW4) for 1 second, and hold the first two push-buttons pressed for 10 secs.

- The 2 leds RADIO1 and RADIO2 will flash quickly for 10 secs.
- The 2 leds will come on with a fixed light for 2 seconds and then go off (deletion carried out).
- Release both push-buttons.

 **This operation is NOT reversible. All the codes of the radiocontrols stored as OPEN A and as OPEN B/CLOSE will be deleted.**

**7 OPERATIONAL START-UP**

**7.1 CHECKING THE LEDS**

After making all the connections and powering the board, check the status of the leds against the status of the inputs in the following table (in Fig. 6, the condition where the automated system is closed in stand-by). These LEDs indicate the status of the board inputs and are of considerable importance to automated system movement:

Note that:  LED ON = contact closed  LED OFF = contact open

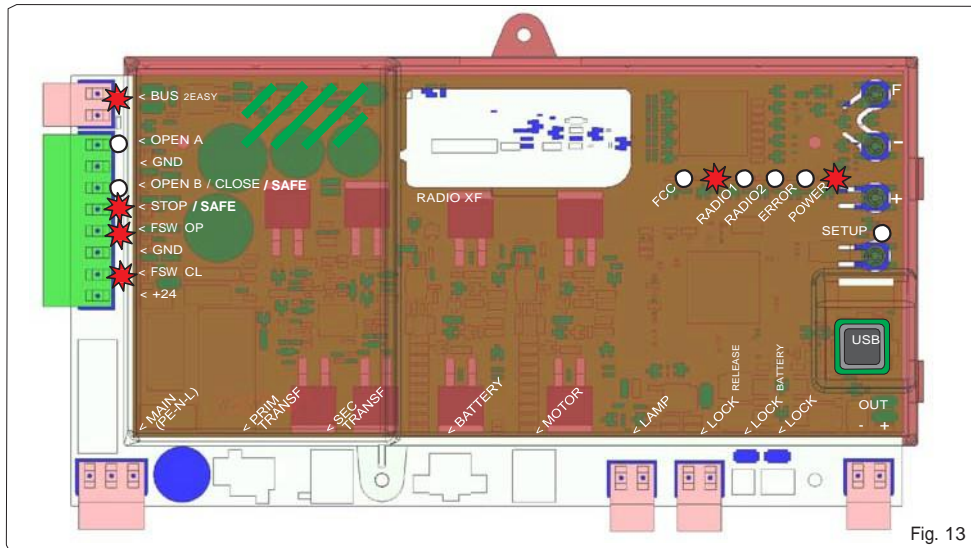






Fig. 13

 The inputs STOP, FSW CL, FSW OP are safety inputs with a N.C. (Normally Closed) contact and the corresponding leds must therefore be ON; where the automated system is in stand-by, they will go off when the connected device is engaged.





 The inputs OPEN A, OPEN B/CLOSE are inputs with a N.O. (Normally Open) contact and the corresponding leds must therefore be OFF; where the automated system is in stand-by, they will come on when the connected device is engaged.

 ERROR led flashing indicates alarm in progress (situation does not impair gate operation)

 ERROR led on with a fixed light indicates an error in progress (situation that locks operation until the cause of the error has been removed)

Leds FCA and FCC represent the N.C. contacts of the limit switch built into the board that open when engaged and turn off the associated led:

Tab. 3 - Description of POWER led

Automated system CLOSED	FCA 
	FCC  FCC engaged
Automated system OPEN	FCA  FCA engaged
	FCC 

<b>Fixed ON</b>	Mains-powered
<b>Flashing</b>	Battery-powered
<b>Off</b>	Board off

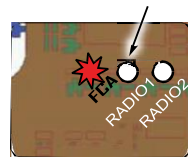
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**7.2 POSITIONING LIMIT SWITCHES**

**!** *To ensure correct positioning of the limit switch magnets, the control unit must be installed and correctly connected with all control and safety accessories.*

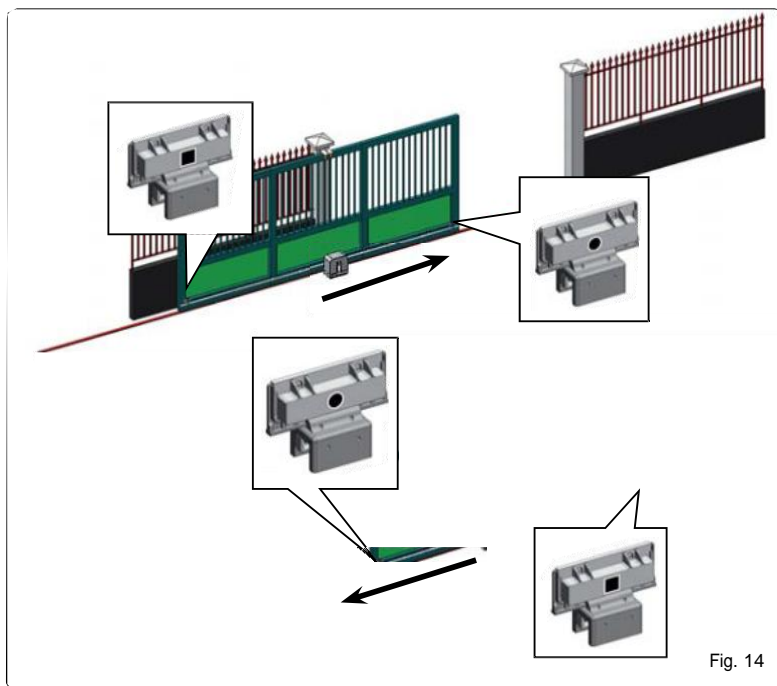
The operator is equipped with a magnetic limit switch sensor built directly into the electronic control board. The gate is stopped, during opening or closing, when the polarised magnet secured to the upper part of the rack activates the sensor.

1. Check that the operator is set for manual operating mode as described in the instructions for the operator.
2. Move the gate to **opening** position manually, leaving 1 5/8 in. from the limit switch mechanical stop (see Fig. 06).
3. Slide the magnet with the **CIRCLE** on the rack in the direction of the motor. As soon as the led for the FCA limit switch on the board goes off, secure with the appropriate screws.
4. Move the gate to **closing** position manually, leaving 1 5/8 in. from the limit switch mechanical stop.
5. Slide the magnet with the **SQUARE** on the rack in the direction of the motor. As soon as the led for the FCC limit switch on the board goes off, secure with the appropriate screws.
6. Check that the relevant limit switch led goes off correctly at the end of the opening and closing movement and make the necessary changes to the position of the limit switch magnet position if necessary.



**!** *To avoid damage to the operator and/or interruptions in the operation of the automated system, approximately 1 5/8 in. must be left from the mechanical limit switch stops.*


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**!**  
For correct operation of the operator, the magnet with the **CIRCLE** must be used as an **OPENING** limit switch and the magnet with the **SQUARE** must be used as a **CLOSING** limit switch.  
(SEE FIG. 07)

Fig. 14

**7.3 SETUP**

 **When the board is powered when no SETUP has ever been carried out, or if the board requires it, the code S0 will flash on the display together with the SETUP led to indicate that SETUP must be carried out.**

 **To ensure the effective outcome of the SETUP procedure, carefully check the correct polarity of the magnetic limit switches as described in the previous paragraph.**

Proceed as follows to carry out the SETUP:

1. **Move the gate leaf to mid-way through its travel (very important to the success of the SETUP) and check that both leds FCA and FCC are on. Otherwise, the board will indicate error 12 (see tab. 5)**
2. Press and hold the SETUP (SW4) push-button until the gate begins to move slowly and stops when it reaches the limit switch. If the limit switch reached is the closing switch (with the **SQUARE**) the device stores that point as the **closing** stop, conversely if the limit switch is the opening switch (with the **CIRCLE**) the device stores that point as the **opening** stop. During that stage, **S1** flashes on the display
3. The gate automatically begins to move slowly in the opposite direction and then stops when it reaches the limit switch. If the limit switch reached is the opening switch (with the **SQUARE**) the device stores that point as the **opening** stop, conversely if the limit switch is the closing switch (with the **SQUARE**) the device stores that point as the **closing** stop. During that stage, **S3** flashes on the display
4. According to the final limit switch reached, the device takes up a status of closed (**00**) or open (**01**). In the second case, issue an OPEN pulse to close the gate.

**8 TESTING THE AUTOMATED SYSTEM**


After installation and programming, check the system is operating correctly. Above all, check that the safety devices operate correctly and ensure that the current safety regulations are met.

**9 ALARM AND ERROR SIGNALS**

If **alarms** occur (conditions that do not impair the operation of the gate) or **errors** (conditions that lock the gate operation) the display shows a number relating to the current condition.

 **The ALARM or ERROR signals disappear at the next cycle only if the triggering cause is removed.**

**9.1 ALARMS**


 **When an ALARM occurs, the ERROR led begins to flash and a number relating to the current fault appears on the display when the + and - keys are pressed.**

Tab. 4 indicates all the alarms that may be shown on the display.

**Tab. 4 - Alarms**

<b>22</b>	Limited MOTOR current
<b>24</b>	LAMP output short-circuited
<b>27</b>	Obstacle detection (visible for 10 secs)
<b>30</b>	XF radio code memory-module full (visible for 10 secs)
<b>40</b>	Service request
<b>46</b>	Forced default programming reset

**9.2 ERRORS**

 **When an ERROR occurs, led DL20 comes on with a fixed light and a number relating to the current fault appears on the display when the + and - keys are pressed.**

Tab. 5 indicates all the errors that may be shown on the display.


**Tab. 5 - Errors**


<b>01</b>	Board faulty
<b>03</b>	Motor faulty
<b>06</b>	Motor lock locked closed (check the motor lock and replace if necessary)
<b>07</b>	Gate too heavy or too much friction (try to increase motor power)
<b>08</b>	BUS-2EASY device error (e.g. same address on two photocell pairs; check address)
<b>10</b>	Both limit switches with the same polarity
<b>12</b>	Limit switch engaged at the beginning of SETUP
<b>15</b>	Time-out finished

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**10 FUNCTION LOGICS**

 **The effects on the other active pulse inputs are shown in brackets**

 **The CLOSE can be activated at the OPEN B input from the 2<sup>nd</sup> programming level**

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LOGIC 'E'				PULSES			
STATUS OF AUTOMATED SYSTEM	OPEN A	OPEN B	CLOSE	STOP	FSW OP	FSW CL	FSW CLOP
CLOSED	opens the gate	opens the gate partially	no effect	no effect (OPEN inhibited)	no effect (OPEN inhibited)	no effect	no effect (OPEN inhibited)
DURING OPENING	locks operation (1)	locks operation	recloses the gate	locks operation	see 2nd level prog.	no effect	locks and opens on disengagement (OPEN locks - stores CLOSE)
OPEN	recloses the gate (1)	recloses the gate	recloses the gate	no effect (OPEN/CLOSE inhibited)	no effect	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)
DURING CLOSING	reopens the gate	reopens the gate	no effect	locks operation	no effect	reverses to opening (see 2nd level prog.)	locks and opens on disengagement (OPEN locks - stores CLOSE)
LOCKED	closes the gate	closes the gate	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect (OPEN inhibited)	no effect (CLOSE inhibited)	no effect (OPEN locks - stores CLOSE)

LOGIC 'EP'				PULSES			
STATUS OF AUTOMATED SYSTEM	OPEN A	OPEN B	CLOSE	STOP	FSW OP	FSW CL	FSW CLOP
CLOSED	opens the gate	opens the gate partially	no effect	no effect (OPEN inhibited)	no effect (OPEN inhibited)	no effect	no effect (OPEN inhibited)
DURING OPENING	locks operation (1)	locks operation	recloses the gate	locks operation	see 2nd level prog.	no effect	locks and opens on disengagement (OPEN locks - stores CLOSE)
OPEN	recloses the gate (1)	recloses the gate	recloses the gate	no effect (OPEN/CLOSE inhibited)	no effect	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)
DURING CLOSING	locks operation	locks operation	no effect	locks operation	no effect	reverses to opening (see 2nd level prog.)	locks and opens on disengagement (OPEN locks - stores CLOSE)
LOCKED	resumes motion in reverse direction. After STOP, always closes	resumes motion in reverse direction. After STOP, always closes	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect (OPEN inhibited)	no effect (CLOSE inhibited)	no effect (OPEN locks - stores CLOSE)

LOGIC 'M'				PULSES			
STATUS OF AUTOMATED SYSTEM	OPEN A	OPEN B	CLOSE	STOP	FSW OP	FSW CL	FSW CLOP
CLOSED	opens and recloses after the pause time	opens the gate partially and closes it after pause time B	no effect	no effect (OPEN inhibited)	no effect (OPEN inhibited)	no effect	no effect (OPEN inhibited)
DURING OPENING	no effect (1)	no effect	recloses the gate	locks operation	see 2nd level prog.	no effect	locks and opens on disengagement (stores CLOSE)
OPEN IN PAUSE	reloads pause time (1)	reloads pause time B	recloses the gate	locks operation	no effect	reloads pause time (CLOSE inhibited)	reloads pause time (CLOSE inhibited)
DURING CLOSING	reopens the gate	reopens the gate	no effect	locks operation	no effect	reverses to opening (see 2nd level prog.)	locks and opens on disengagement (stores CLOSE)
LOCKED	closes the gate	closes the gate	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect (OPEN inhibited)	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)

LOGIC 'A1'				PULSES			
STATUS OF AUTOMATED SYSTEM	OPEN A	OPEN B	CLOSE	STOP	FSW OP	FSW CL	FSW CLOP
CLOSED	opens and recloses after the pause time	opens the gate partially and closes it after pause time B	no effect	no effect (OPEN inhibited)	no effect (OPEN inhibited)	no effect	no effect (OPEN inhibited)
DURING OPENING	no effect (1)	no effect	recloses the gate	locks operation	see 2nd level prog.	continues to open and recloses immediately	locks and opens on disengagement (stores CLOSE)
OPEN IN PAUSE	reloads pause time (1)	reloads pause time B	recloses the gate	locks operation	no effect	locks and immediately closes on disengagement	reloads pause time (CLOSE inhibited)
DURING CLOSING	reopens the gate	reopens the gate	no effect	locks operation	no effect	reverses to opening (see 2nd level prog.)	locks and opens on disengagement (stores CLOSE)
LOCKED	closes the gate	closes the gate	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect (OPEN inhibited)	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)

(1) During the partial opening cycle, an OPEN A pulse causes total opening

LOGIC 'AP'		PULSES					
STATUS OF AUTOMATED SYSTEM	OPEN A	OPEN B	CLOSE	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens and recloses after the pause time	opens the gate partially and closes it after pause time B	no effect	no effect (OPEN inhibited)	no effect (OPEN inhibited)	no effect	no effect (OPEN inhibited)
DURING OPENING	locks operation (1)	locks operation	recloses the gate	locks operation	see 2nd level prog.	no effect	locks and opens on disengagement (OPEN locks - stores CLOSE)
OPEN IN PAUSE	locks operation (1)	locks operation	recloses the gate	locks operation	no effect	reloads pause time (CLOSE inhibited)	reloads pause time (CLOSE inhibited)
DURING CLOSING	reopens the gate	reopens the gate	no effect	locks operation	no effect	reverses to opening (see 2nd level prog.)	locks and opens on disengagement (OPEN locks - stores CLOSE)
LOCKED	closes the gate	closes the gate	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect (OPEN inhibited)	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)

LOGIC 'M' (2)		PULSES					
STATUS OF AUTOMATED SYSTEM	OPEN A	OPEN B	CLOSE	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens and recloses after the pause time	opens the gate partially and closes it after pause time B	no effect	no effect (OPEN inhibited)	no effect (OPEN inhibited)	no effect	no effect (OPEN inhibited)
DURING OPENING	no effect (1)	no effect	recloses the gate	locks operation	reverses to closing (1)	no effect	locks and opens on disengagement (stores CLOSE)
OPEN IN PAUSE	reloads pause time (1)	reloads pause time	recloses the gate	locks operation	no effect	reloads pause time (CLOSE inhibited)	reloads pause time (CLOSE inhibited)
DURING CLOSING	reopens the gate	reopens the gate	no effect	locks operation	no effect	reverses to opening (see 2nd level prog.)	locks and opens on disengagement (stores CLOSE)
LOCKED	closes the gate	closes the gate	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect (OPEN inhibited)	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)

LOGIC 'S'		PULSES					
STATUS OF AUTOMATED SYSTEM	OPEN A	OPEN B	CLOSE	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens and recloses after the pause time	opens the gate partially and closes it after pause time B	no effect	no effect (OPEN inhibited)	no effect (OPEN inhibited)	no effect	no effect (OPEN inhibited)
DURING OPENING	reverses to closing (1)	reverses to closing (1)	recloses the gate	locks operation	see 2nd level prog.	continues to open and recloses immediately	locks and opens on disengagement (stores CLOSE)
OPEN IN PAUSE	recloses the gate (1)	recloses the gate	recloses the gate	locks operation	no effect	locks and immediately closes on disengagement	locks and closes on disengagement
DURING CLOSING	reopens the gate	reopens the gate	no effect	locks operation	no effect	reverses to opening (see 2nd level programming) and closes immediately at the end	locks and on disengagement opens and at the end immediately closes
LOCKED	closes the gate	closes the gate	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect (OPEN inhibited)	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)

LOGIC 'SP'		PULSES					
STATUS OF AUTOMATED SYSTEM	OPEN A	OPEN B	CLOSE	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens and recloses after the pause time	opens the gate partially and closes it after pause time B	no effect	no effect (OPEN inhibited)	no effect (OPEN inhibited)	no effect	no effect (OPEN inhibited)
DURING OPENING	locks operation (1)	locks operation	recloses the gate	locks operation	see 2nd level prog.	continues to open and recloses immediately	locks and on disengagement opens and at the end immediately closes (OPEN locks - stores CLOSE)
OPEN IN PAUSE	recloses the gate (1)	recloses the gate	recloses the gate	locks operation	no effect	locks and immediately closes on disengagement	locks and immediately closes on disengagement
DURING CLOSING	locks operation	locks operation	no effect	locks operation	no effect	reverses to opening (see 2nd level prog.)	locks and opens on disengagement (stores CLOSE)
LOCKED	resumes motion in reverse direction. After STOP, always closes	resumes motion in reverse direction. After STOP, always closes	recloses the gate	no effect (OPEN/CLOSE inhibited)	no effect (OPEN inhibited)	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)

(1) During the partial opening cycle, an OPEN A pulse causes total opening

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LOGIC 'SA'		PULSES					
STATUS OF AUTOMATED SYSTEM	OPEN A	OPEN B	CLOSE	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens and recloses after the pause time	Opens the gate partially and closes it after pause time B	no effect	no effect (OPEN inhibited)	no effect (OPEN inhibited)	no effect	no effect (OPEN inhibited)
DURING OPENING	no effect (1)	no effect	recloses the gate	locks operation	see 2nd level prog.	no effect	locks and opens on disengagement (stores CLOSE)
OPEN IN PAUSE	recloses the gate (1)	recloses the gate	recloses the gate	locks operation	no effect	reloads pause time (CLOSE inhibited)	reloads pause time (CLOSE inhibited)
DURING CLOSING	reopens the gate	reopens the gate	no effect	locks operation	no effect	reverses to opening (see 2nd level prog.)	locks and opens on disengagement (stores CLOSE)
LOCKED	closes the gate	closes the gate	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect (OPEN inhibited)	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)

LOGIC 'B'		PULSES					
STATUS OF AUTOMATED SYSTEM	OPEN A	/	CLOSE	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens the gate	/	no effect	no effect (OPEN inhibited)	no effect (OPEN inhibited)	no effect	no effect (OPEN inhibited)
DURING OPENING	no effect	/	closes the gate	locks operation	see 2nd level prog.	no effect	locks and opens on disengagement (stores OPEN/CLOSE)
OPEN	no effect	/	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)
DURING CLOSING	opens the gate	/	no effect	locks operation	no effect	reverses to opening (see 2nd level prog.)	locks and opens on disengagement (stores OPEN/CLOSE)
LOCKED	opens the gate	/	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect (OPEN inhibited)	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)

LOGIC bC		PULSES DURING OPENING/COMMANDS MAINTAINED DURING CLOSING			PULSES		
STATUS OF AUTOMATED SYSTEM	OPEN A	/	CLOSE	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens the gate	/	no effect	no effect (OPEN inhibited)	no effect (OPEN inhibited)	no effect	no effect (OPEN inhibited)
DURING OPENING	no effect	/	closes the gate	locks operation	see 2nd level prog.	no effect	locks and opens on disengagement (stores OPEN/CLOSE)
OPEN	no effect	/	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)
DURING CLOSING	opens the gate	/	no effect	locks operation	no effect	reverses to opening (see 2nd level prog.)	locks and opens on disengagement (stores OPEN/CLOSE)
LOCKED	opens the gate	/	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect (OPEN inhibited)	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)

LOGIC 'C'		COMMANDS MAINTAINED			PULSES		
STATUS OF AUTOMATED SYSTEM	OPEN A	/	CLOSE	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens the gate	/	no effect	no effect (OPEN inhibited)	no effect (OPEN inhibited)	no effect	no effect (OPEN inhibited)
DURING OPENING	no effect	/	closes the gate	locks operation	see 2nd level prog.	no effect	locks and on disengagement 2nd level prog.
OPEN	no effect	/	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)
DURING CLOSING	opens the gate	/	no effect	locks operation	no effect	locks operation	locks operation
LOCKED	opens the gate	/	closes the gate	no effect (OPEN/CLOSE inhibited)	no effect (OPEN inhibited)	no effect (CLOSE inhibited)	no effect (OPEN/CLOSE inhibited)

(1) During the partial opening cycle, an OPEN A pulse causes total opening (2) When turned on, the board checks the inputs and if an OPEN A or B command is active, it opens the leaf or gate. Otherwise it closes it.

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