

CE DECLARATION OF MACHINE CONFORMITY

(DIRECTIVE 89/392/EEC, ANNEX II, PART B)

Manufacturer : FAAC S.p.A.

Address: Via Benini, 1 - 40069 Zola Predosa BOLOGNA - ITALY

Declares that: Operator mod. 531EM with electronic control unit 531MPS,


- is manufactured to be incorporated in a machine or for assembly with other machines to constitute a machine under the provisions of Directive 89/392/EEC, and subsequent amendments 91/368/EEC, 93/44/EEC, 93/68/EEC;
- conforms to the essential safety requirements of the following further EEC Directives:

73/23/EEC and subsequent amendment 93/68/EEC.
89/336/EEC and subsequent amendment 92/31/EEC and 93/68/EEC

and, furthermore, declares that putting the machine into service is forbidden until the machine in which it will be incorporated or of which it will become a part has been identified and it has been declared as conforming to the conditions of Directive 89/392/EEC and subsequent amendments enacted by the national implementing legislation.

Bologna, 01 January 2004

The Managing Director
A. Bassi



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 motorised, 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 3mm 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 means of the closure to it.
- 15) The safety devices (EN 12978 standard) protect any danger areas against **mechanical movement Risks**, such as crushing, dragging, and shearing.
- 16) 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 "15".
- 17) FAAC declines all liability as concerns safety and efficient operation of the automated system, if system components not produced by FAAC are used.
- 18) For maintenance, strictly use original parts by FAAC.
- 19) Do not in any way modify the components of the automated system.
- 20) 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.
- 21) Do not allow children or adults to stay near the product while it is operating.
- 22) Keep remote controls or other pulse generators away from children, to prevent the automated system from being activated involuntarily.
- 23) Transit under the door is permitted only when the automated system is idle.
- 24) The user must not attempt any kind of repair or direct action whatever and contact qualified personnel only.
- 25) Maintenance: 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.
- 26) **Anything not expressly specified in these instructions is not permitted.**

GENERAL SAFETY INSTRUCTIONS FOR INSTALLATION AND MAINTENANCE

For an efficient and safe automated door, correctly observe the installation procedures and use instructions. Incorrect installation and use can cause serious damage to persons and property.

Carefully read the whole installation manual before you begin installing.
Do not make any modifications which are not mentioned in this manual.
Do not install the operator for uses other than those indicated.

To fasten, use the supplied accessories or, in any case, fastening systems (screws, expansion plugs, etc.) suitable for the type of support and for the mechanical stresses exerted by the automated system.

Check if the sectional door conforms to standards EN12604 and EN12605 (the information can be found in the documentation accompanying the door itself). For non-EU countries, the above mentioned standards must be observed in addition to the national standard references to get a suitable safety level.

Make sure that the door is correctly balanced, correctly operational, and supplied with mechanical opening stops.

When installing we advise you to:

- obtain the material and tools indicated in the following paragraph "Tools and materials" and keep them near at hand.
- use a stable support for performing operations without a floor support.
- protect your face and hands adequately before making the holes with the drill.
- do not allow children to play near during installation, use and during the automated system release manoeuvre.
- remove any debris and objects which could hamper movement, before powering up the system.
- remove the door's closing mechanism to ensure the door is closed by the automatism.
- stick on the warning stickers as shown in the instruction.

Install the manual release devices at a height of not over 180cm.

Install the external control devices at a height of not below 150 cm, clear of the door movement area, but in a position enabling visual control of the area.

When you have finished installing, check if the anti-crushing device is able to detect a 50mm high object on the ground and if a weight of 20 kg applied to the door, causes the opening movement to stop.

Use the automated system observing the instructions in the "User's guide".

The 531EM automated system does not require periodic replacement of parts.

Every month, run a functional check of the safety devices and of the anti-crushing system: a non-deformable object with a height of 50 mm laid on the ground, must be correctly detected

Draft, keep and update the maintenance register.

TOOLS AND MATERIALS

Tools required for installing the 531EM operator.

- a hammer drill with relevant wall and iron bits
- screwdrivers for cross-head and cut-head screws
- two flat wrenches for 13 mm hexagon head screws

Material required for installing the 531EM operator and the relevant accessories (if present):

- cable 2x0.5 mm² (emitting photocells, pulse generators for opening movement and stop)
- cable 3x0.5 mm² (radio receiver Plus 1 or PL)
- cable 4x0.5 mm² (receiver photocells)
- cable 2x1.5 mm² (flashing lamp)
- cable 2 x 1.5 + earth (power supply)

Use cables with an adequate degree of insulation.

The electric system must conform to the prescriptions in the chapter entitled "Warnings for the installer".

The 230 Vac power cable must be laid and connected by a qualified installation technician. Arrange for a Schuko 16A socket to be installed near the operator.

Lay the cables in the appropriate pipes and do not allow loose cables to come into contact with moving parts of the automated system and the door.

AUTOMATIC SYSTEM 531EM

These instructions apply to model FAAC 531EM. The 531EM automated systems make it possible to automate balanced sectional doors of single garages for residential use. They consist of an electromechanical operator, electronic control equipment and courtesy light built into a single unit which, fitted to the ceiling, allows door opening by means of a chain or belt transmission.

The non-reversing system guarantees mechanical door locking when the motor is not operating, therefore no lock is necessary; a manual release on the inside and one on the outside (optional) allow the door to be moved manually in case of a power failure or malfunction.

The operator is supplied with an electronic device that detects the presence of an obstacle that would hinder door movement, and that prevents crushing or lifting.

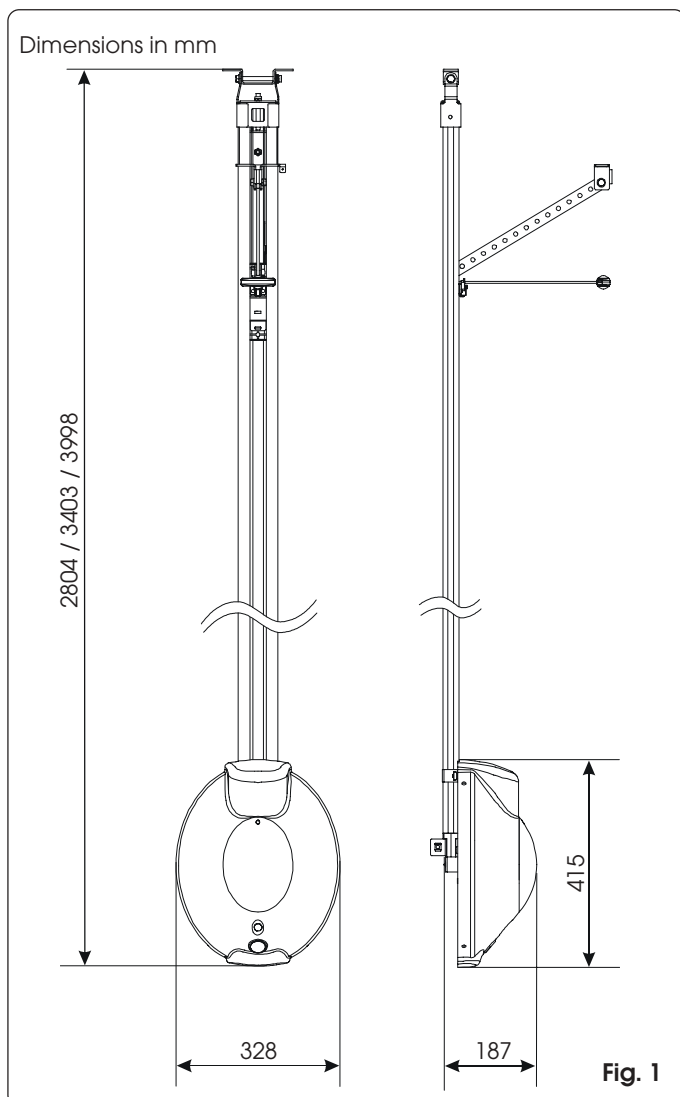
These instructions refer to the operator with chain drive, but the same procedures, adjustments and application limits also apply to the operator with belt drive.

The 531EM automatic systems are designed and built for indoor use and for controlling vehicle entry. Any other use is improper.

1. TECHNICAL SPECIFICATIONS

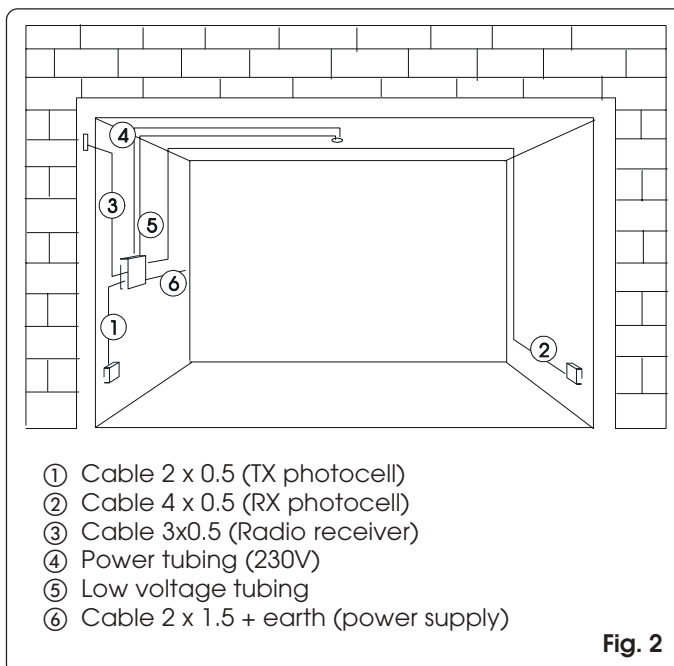
MODEL	531EM
Power supply (Vac +6 -10% 50Hz)	230
Electric motor (Vdc)	24
Maximum absorbed power (W)	220
Thrust force (N)	600
Type of use	Continuous
Minimum distance from ceiling (mm)	35
Courtesy light (Vac-W)	230 - 25 max
Courtesy light timer (sec)	120
Standard speed of carriage load free (m/min)	6,6
Lower speed of carriage load free (m/min)	3,8
Deceleration speed (m/min)	1,3
Noise at standard speed (dB(A))	45
Deceleration travel length	Varies according to setup
Intrinsic safety device	Category 2
Sectional door max. width (mm)	5000
Door max. height	see useful travel
Useful sliding guide travel (mm)	1900 - 2500 - 3100
Protection rating	for indoor use only
Ambient temperature (°C)	-20 / +55

2. DIMENSIONS



3. ANCILLARY ELECTRICAL EQUIPMENT

Prepare the electrical system in compliance with the instructions in the chapter entitled "Warnings for the installer". When you have finished installing, check if any external pipes or cables can come into contact with moving parts. Install the fixed control points at a minimum height of 150 cm, clear of the door movement area, but in a position enabling visual control of that area.



4. DESCRIPTION

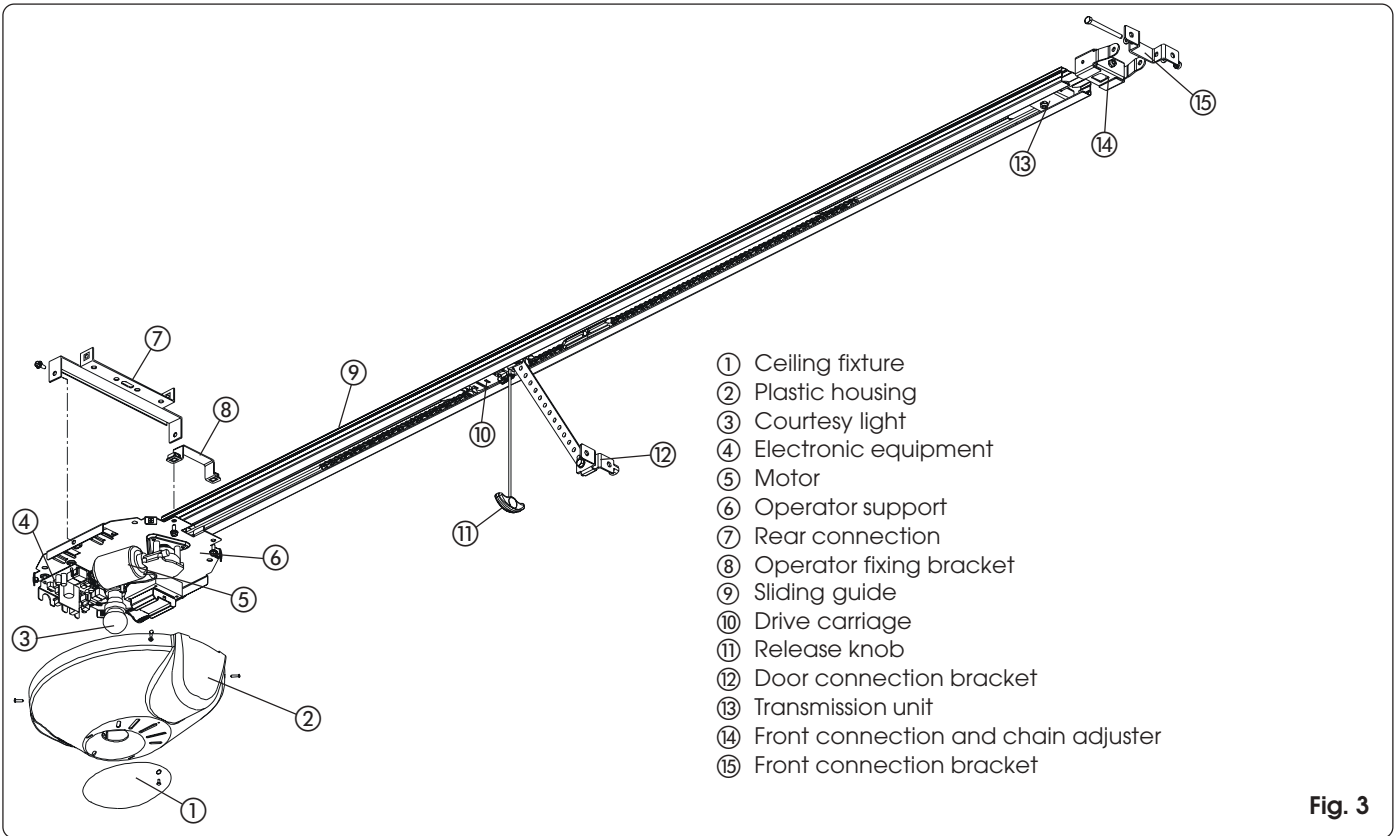


Fig. 3

5. PRELIMINARY CHECKS

The door structure must be suitable for automation. In particular, check that the door dimensions conform to those given in the technical specifications and that the door is strong enough. Check if the door conforms to standards EN12604 and EN12605. As it moves, the door must not encroach public areas dedicated to pedestrian or vehicle transit.

Check the efficiency of the door bearings and joints. Make sure that the door is friction free. If necessary clean and lubricate the guides with silicone based products, but do not use grease, and, in any event, follow the constructor's instructions.

Check correct balance and if the opening mechanical stops have been installed.

Remove the door's mechanical closing devices so that the door is closed by the automatic system. Check if there is an efficient earth plate for electrical connection of the operator. Make sure there is a clearance of at least 35 mm between the ceiling and the highest sliding point of the door (fig. 4). Check if the upper guide roller of the sectional door is in the horizontal part of the guide while the door is closed (fig. 5).

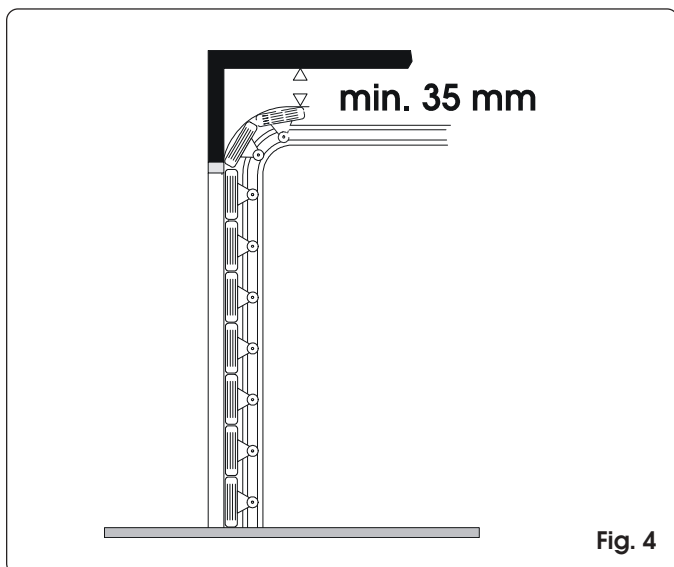


Fig. 4

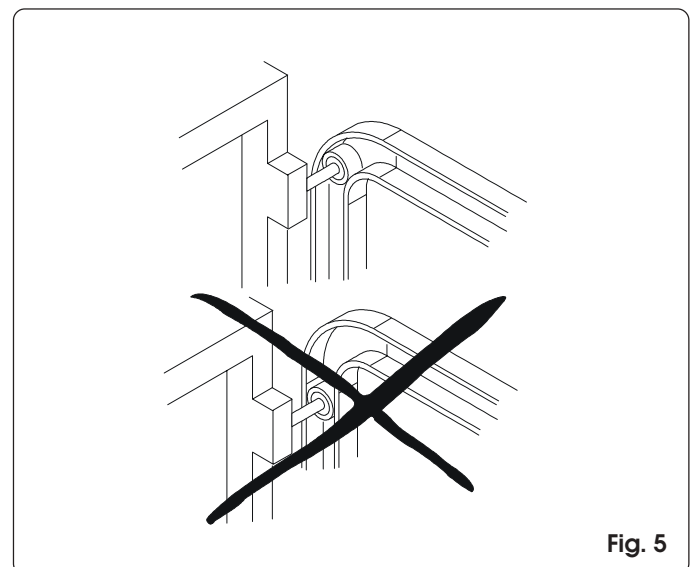


Fig. 5

6. ASSEMBLY

6.1. SLIDING GUIDE

When using the "two pieces sliding guide", carry out assembly as described below. If an already assembled guide is available, go to par. 6.2.

- 1) Assemble the two parts of the sliding guide, inserting them in the central joint (fig. 6 ref. A) up to the metal reference stops (fig. 6 ref. B). To facilitate fitting the sliding guide, insert it in the central joint, compressing it as shown in Fig. 6 ref. C. Do not use tools which could deform the guide or the joint.

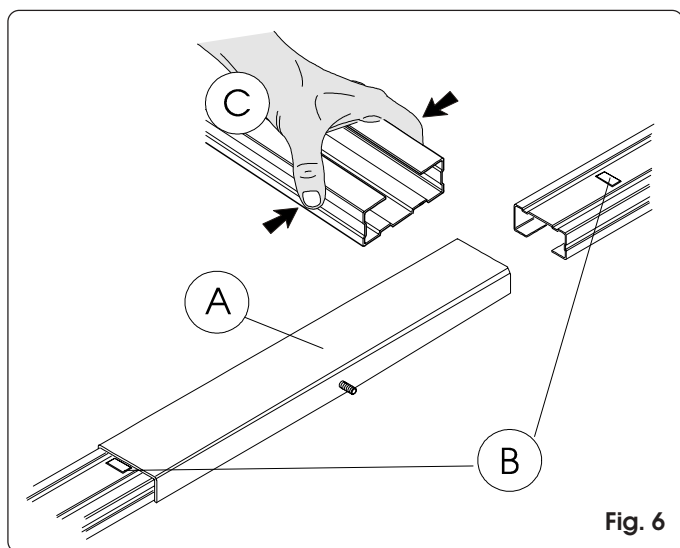


Fig. 6

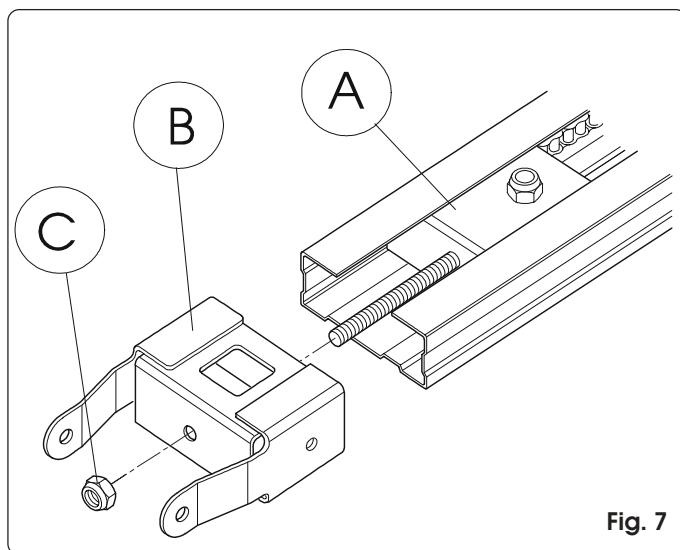


Fig. 7

- 2) Slide the transmission unit all the way along the sliding guide (fig. 7 ref. A) bringing it near the front terminal.
- 3) Fit the front connection (fig. 7 ref. B) to the transmission unit (fig. 7 ref. A).
- 4) Tighten the chain a little by tightening the nut (fig. 7 ref. C).
- 5) Place the sliding guide on its side (fig. 8)
- 6) Push the carriage near the drive coupling unit (fig. 8 ref. C).
- 7) Adjust the tensioner (fig. 8 ref. A) so that the central part of the loop, formed of the upper section of the chain, coincides approximately with middle of the sliding guide (fig. 8 ref. B)

Warning: overtightening can damage the transmission unit and drive coupling.

6.2. REAR CONNECTION

Fit the rear connection in the special seat on the drive coupling unit (fig. 9).

If the operator has to be installed directly in contact with the ceiling, cut or bend the fixing brackets (fig. 9 ref. A) and, in the latter case, remove the cage nut. For fixing, the special holes are used (fig. 9 ref. B). Prepare a shim of approx. 5 mm for inserting between the rear connection and the ceiling.

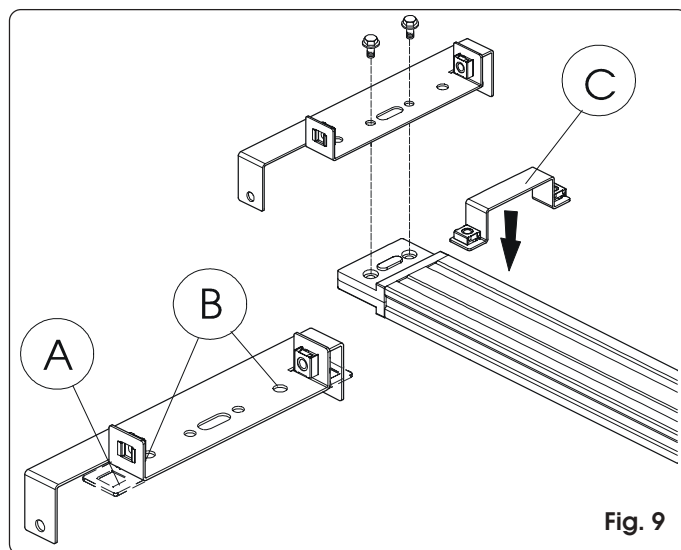


Fig. 9

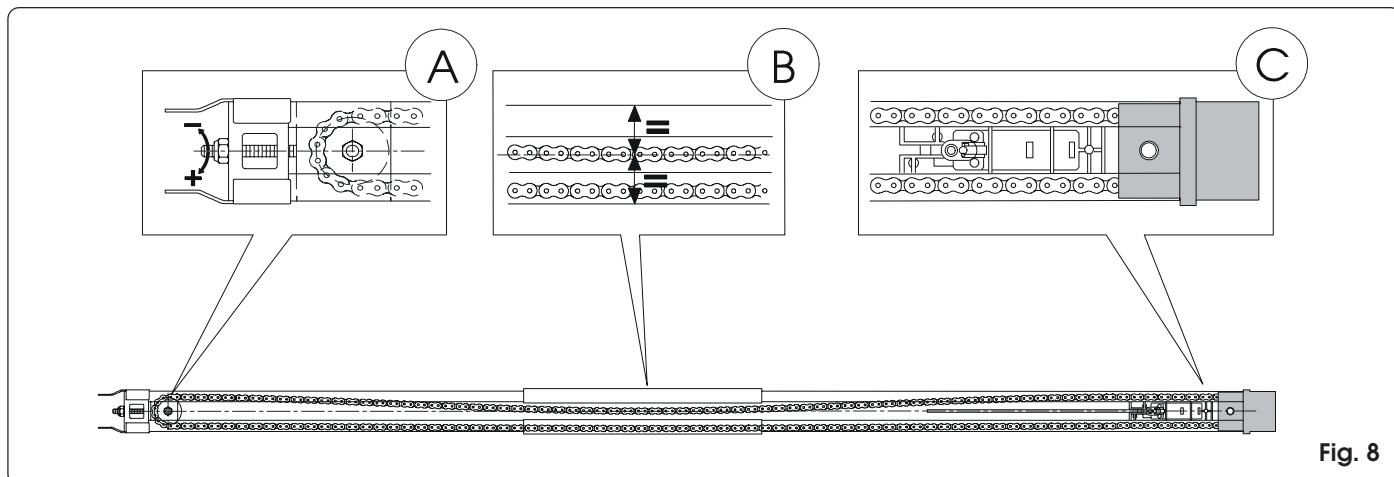


Fig. 8

6.3. OUTSIDE RELEASE DEVICE (optional)

When using the outside release device, fit the cable in the seat before starting installation.

- 1) Release the carriage (see par. 7.4. point 3) and bring it to the slot located on the upper part of the sliding guide.
- 2) Insert the cable end in the special red seat (fig. 10).
- 3) Move the carriage back towards the drive coupling unit until the through hole on the carriage matches the slot and insert the unsheathed cable (fig. 11).
- 4) Pull the cable out from the bottom part of the carriage.
- 5) Wind the cable around so that it is not a hindrance when installing the sliding guide.

7. INSTALLATION

To ensure you work in safe conditions, we advise you to install the operator while keeping the door fully closed.

Use the specified anchorage points.

The fastening systems must be suitable for the type of support and sufficiently tough.

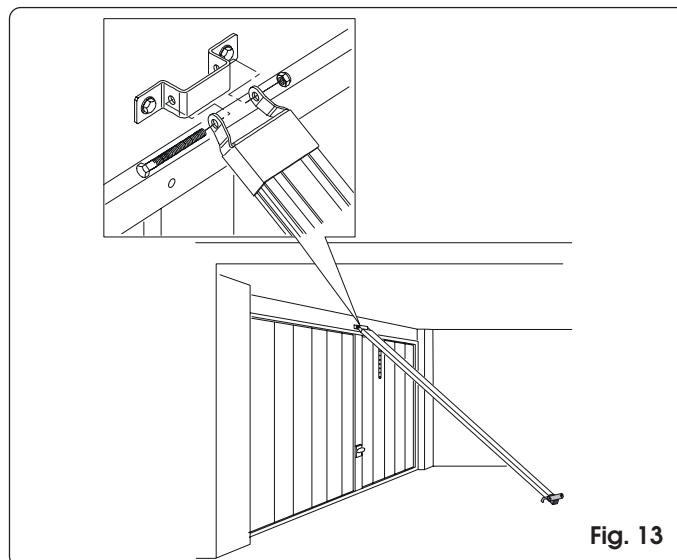
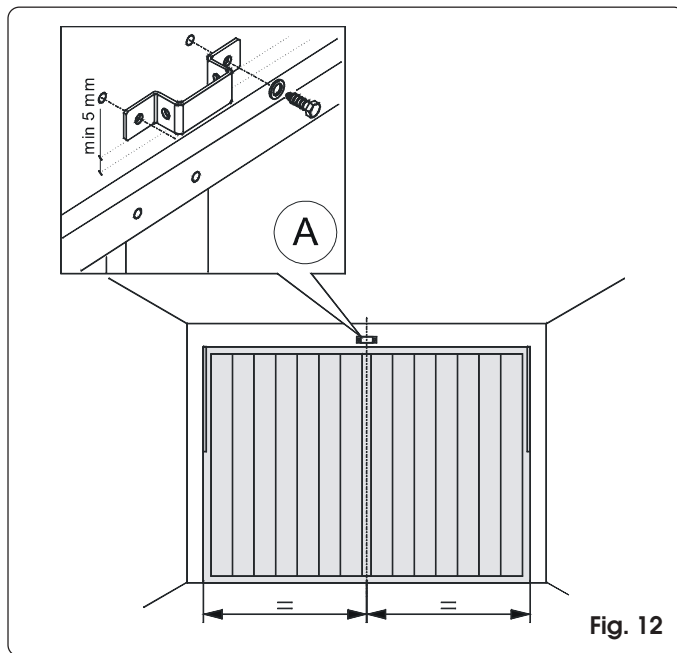
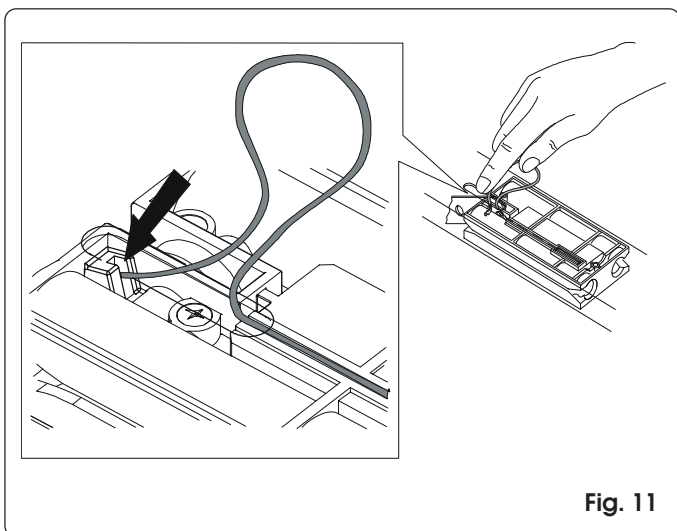
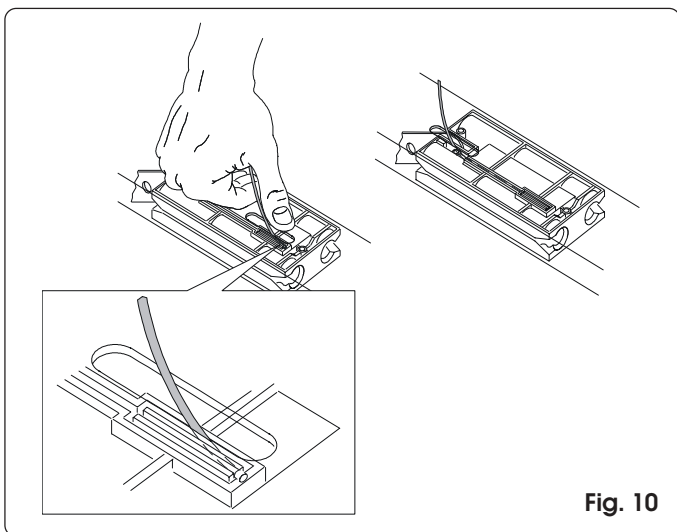
Protect your hands and face adequately while drilling the holes.

Read this chapter to the full before you begin installing.

7.1. SLIDING GUIDE

After completing the preliminary assembly operations, install the sliding guide, proceeding as follows:

- 1) Draw a vertical line on the lintel, corresponding to the centre of the door (fig. 12).
- 2) Draw a horizontal line on the lintel, corresponding to the max. height reached by the door during movement (see fig. 4).
- 3) Position the front connection fixing bracket with bottom edge at least 5 mm above the intersection point of the lines and centred with the vertical line (fig. 12). See par. 7.2. for correct positioning of the bracket with respect to the connection point on the door.
- 4) Mark the two fixing points.
- 5) Drill the holes and proceed with installation.
- 6) Position the sliding guide on the ground, perpendicular to the door.
- 7) Lift the guide from the front connection and assemble the connection with the fixing bracket using the special through screw and nut (fig. 13).

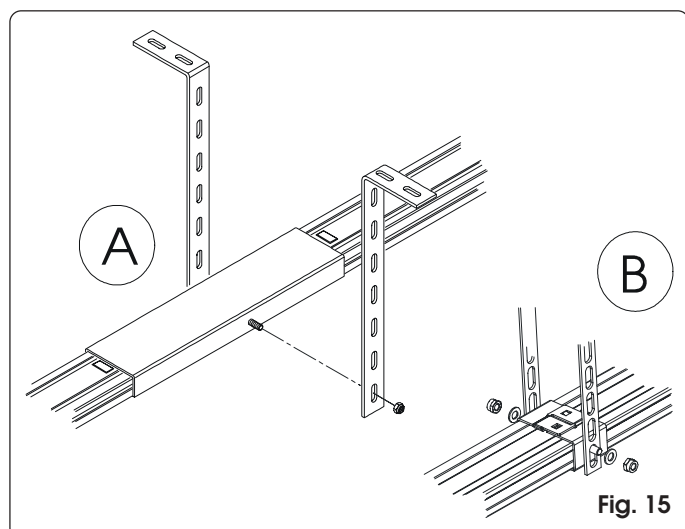
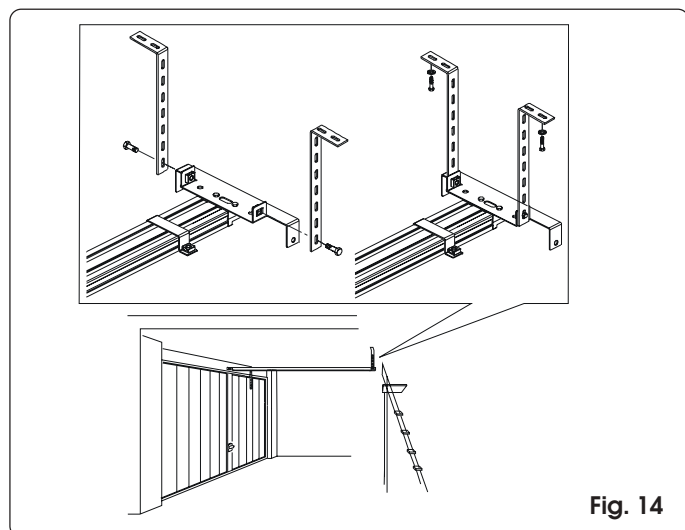
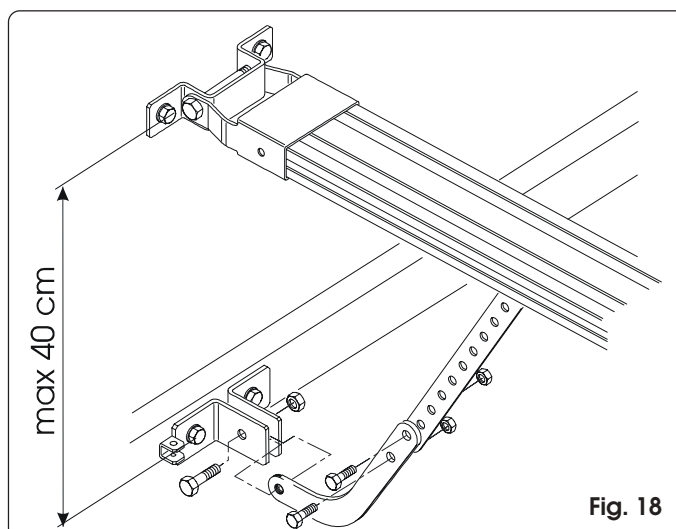
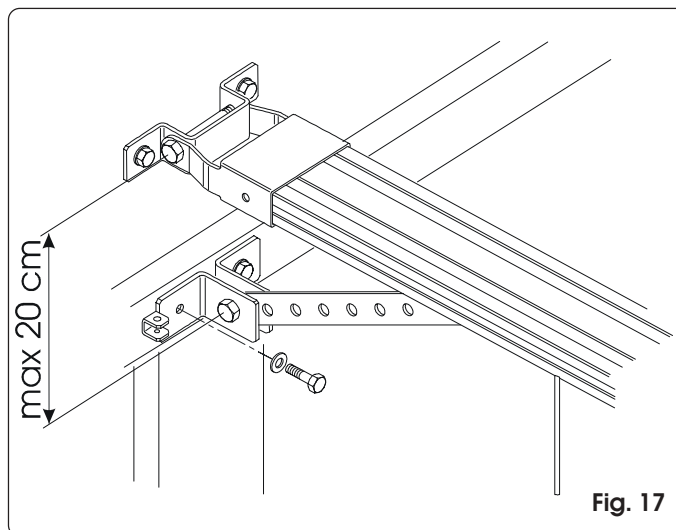
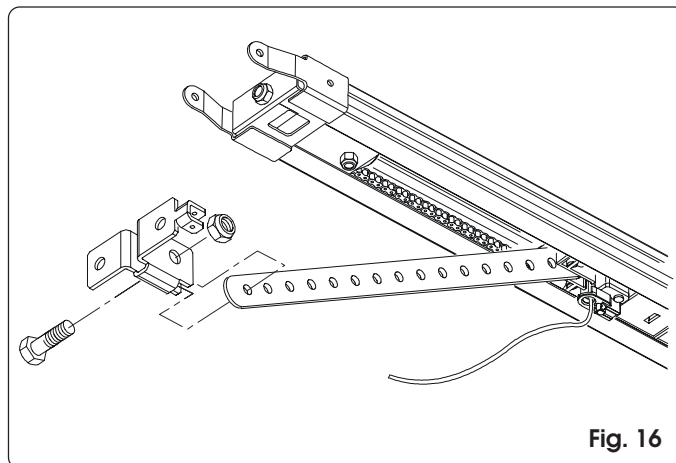


- 8) Lift the sliding guide bringing the rear connection to the same level as the front one, or until reaching the same angle as the door horizontal rail. For direct fixing to the ceiling, go to point 12, after modifying the rear connection as indicated in par. 6.2.
- 9) Measure the distance between ceiling and the centre distance of the rear connection fixing nuts.
- 10) Bend the brackets (supplied) to the measurement made (measure from the centre of the first slot on the bracket).
- 11) Fit the brackets on the rear connection and reposition the sliding guide (fig. 14).
- 12) Mark the fixing points on the ceiling, drill (taking care to protect the sliding guide), position the front fixing bracket of the operator (fig. 9 ref. C and fig. 14) and complete guide installation.
- 13) If using a "two pieces sliding guide" with central connection (fig. 15 ref. A) or the central support for single rail (fig. 15 ref. B - optional), carry out ceiling fixing using the special brackets, proceeding as described in steps 9,10 and 12 (fig. 15).

7.2. CONNECTION ON DOOR

- 1) Assemble the connection bracket with the carriage bar (fig. 16).
If using the outside release device, position the connection bracket on the door so that the release wire loop is turned towards the left side of the door (fig. 16 and 17).
- 2) Close the door and bring the carriage near it.
- 3) Position the connection bracket on the door centred with

- the middle.
- 4) Check that the distance between centres of the door connection and front connection bracket fixing holes is not more than 20 cm (fig. 17). For correct working of the automatic system avoid arm angles of more than 30° with respect to the sliding guide.
If using the curved arm for sectional doors (optional) carry out assembly with the straight arm of the carriage as indicated in fig. 18. To improve the efficiency of the anticrushing system it is advisable to fix the connection bracket on the sectional door in the lowest position possible, but not more than 40 cm from the front connection of the operator.
 - 5) Mark, drill and fix the connection bracket to the door.



7.3. OPERATOR

After installing the sliding guide, install the operator:

- 1) Remove the plastic housing.
- 2) Unscrew the courtesy light.
- 3) Insert the gear motor shaft in the coupling located in the sliding guide rear connection (fig. 19).
- 4) Fix the operator to the guide (fig. 20).

7.4. AUTOMATIC SYSTEM RELEASE

- 1) Define the height of the release knob, taking into account that it must not be over 180 cm off the ground, and cut off the excess section of rope.
- 2) Tie a knot in the end of the cord and assemble the release handle (fig. 21).
- 3) Pull the release lever downwards and make sure the door can be moved manually (fig. 22).
- 4) Pull the release handle sideways in the direction of the door (fig. 23). Check that, on releasing the handle, the LOCK window located under the carriage is red. Manually move the door until locating the carriage coupling point.

Attention: make sure that there are no persons, animals or objects in the door movement area during the release manoeuvre.

7.5. OUTSIDE RELEASE

If the automatic system is equipped with an outside release device, conclude the installation already started (see par. 6.3.):

- 1) Cut the cable sheathing to size (fig. 24 ref. A).
- 2) Insert the cable in the sheath and through the special eyelet of the connection bracket on the door (fig. 24 ref. B).
- 3) Cut the cable to size and assemble it with the inside lever of the release handle (fig. 24 ref. C).

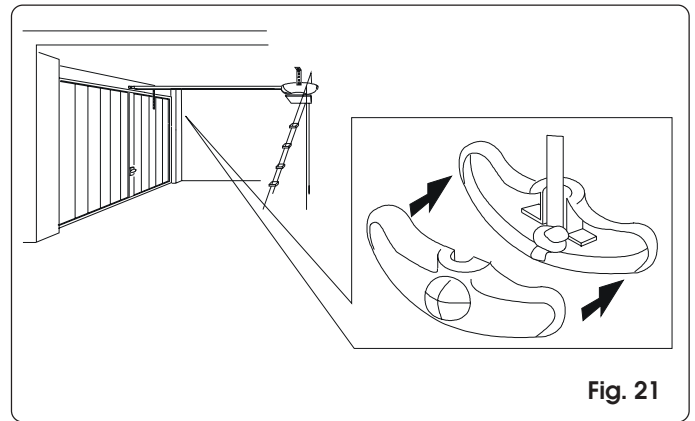


Fig. 21

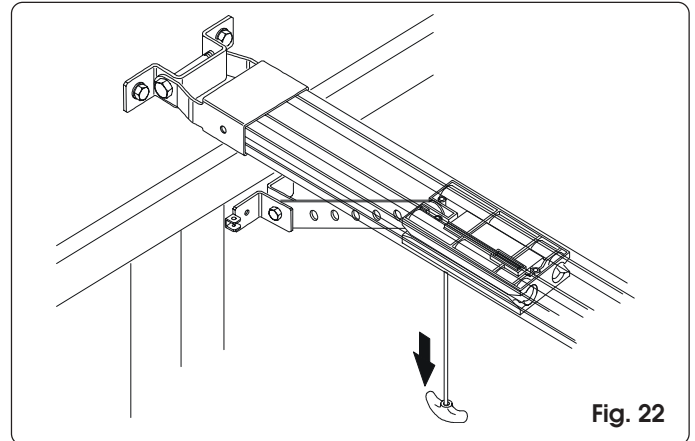


Fig. 22

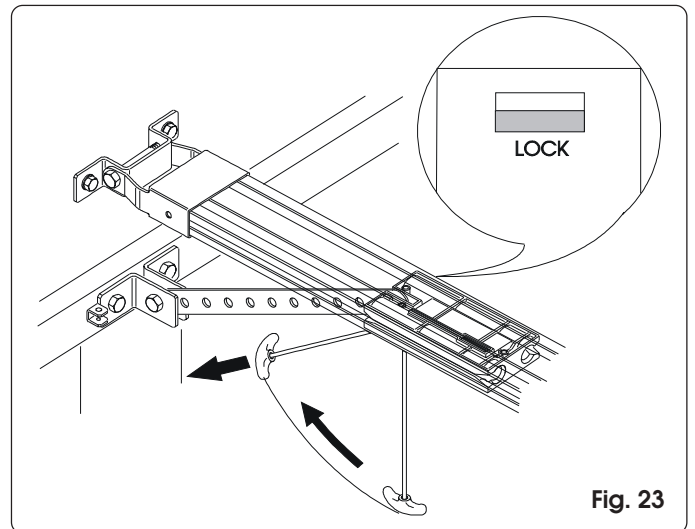


Fig. 23

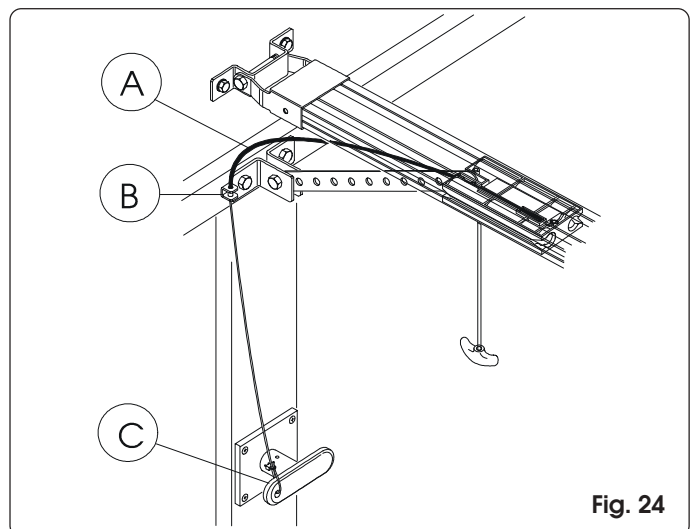


Fig. 24

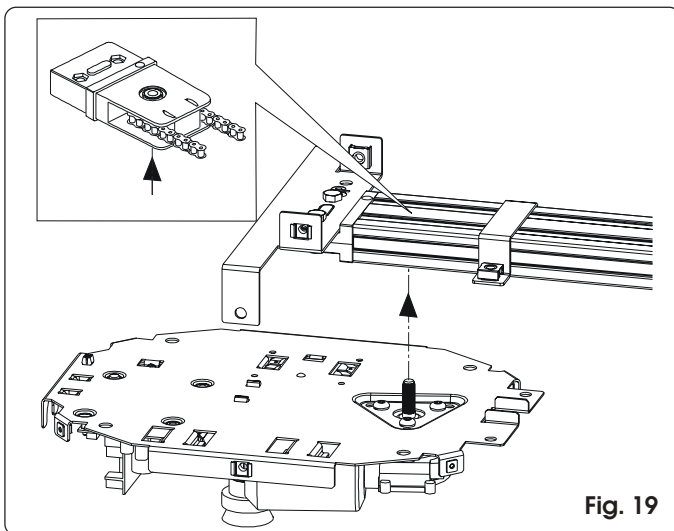


Fig. 19

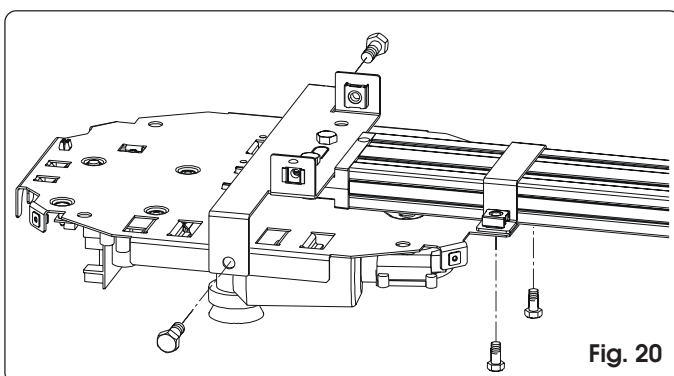


Fig. 20

8. 531MPS ELECTRONIC CARD

8.1. TECHNICAL SPECIFICATIONS

Power supply	230 Vac 50 Hz
Accessories power supply	24 Vdc
Accessories max. load	200 mA
Ambient temperature	-20°/+55°C
Motor protection	fuses
Quick connector	for decoding cards and RP receivers
Function logics	Automatic/ Semiautomatic
Terminal board connections	Open/Stop/Safety devices/Failsafe/Flasher
Courtesy light timer	2 min.

8.2. 531MPS CARD COMPONENTS

F1	Motor fuse (10A)
F2	Accessories protection 0.25A automatic reset
J1	Low voltage terminal board for inputs /accessories
J2	Quick connector for decoding/RP receivers cards
J3	230V power supply input terminal board
J4	Transformer primary connector
J5	Courtesy light connector
J6	Flashing light output terminal board
J7	Transformer secondary connector
J8	Motor output connector
P1	Open pushbutton
P2	Set-up pushbutton
DS1	Programming dip-switches
LD1	OPEN input signalling LED
LD2	STOP input signalling LED
LD3	FSW input signalling LED

8.3. DESCRIPTION

8.3.1. Terminal boards and connectors

TERMINAL BOARD J1 (low voltage)

OPEN=Open Command (N.O.)

Any device (pushbutton, detector, etc.) which, by closing a contact, supplies an opening (or closing) pulse to the door.

To install several Open devices, connect N.O. contacts in parallel.

STOP=Stop command (N.C.)

Any device (e.g. a pushbutton) which, by opening a contact, stops door movement.

To install several stop devices, connect the N.C. contacts in series.

N.B.: if stop devices are not used, jumper connect STOP to the inputs common contact.

⊖ = Inputs/negative accessories supply common contact.

⊕ = Accessories supply positive pole (24Vdc 200mA max)

FSW= Closing safety devices contact (N.C.)

Safety devices are all devices (photocells, sensitive edges, etc.) with N.C. contact which, in case of an obstacle in the area they protect, cut in to reverse door closing movement. If the safety devices are activated when the door is locked or open, they prevent it from closing.

To install several safety devices, connect the N.C. contacts in series.

N.B.: if safety devices are not connected, jumper connect FSW to the terminal -TX FSW.

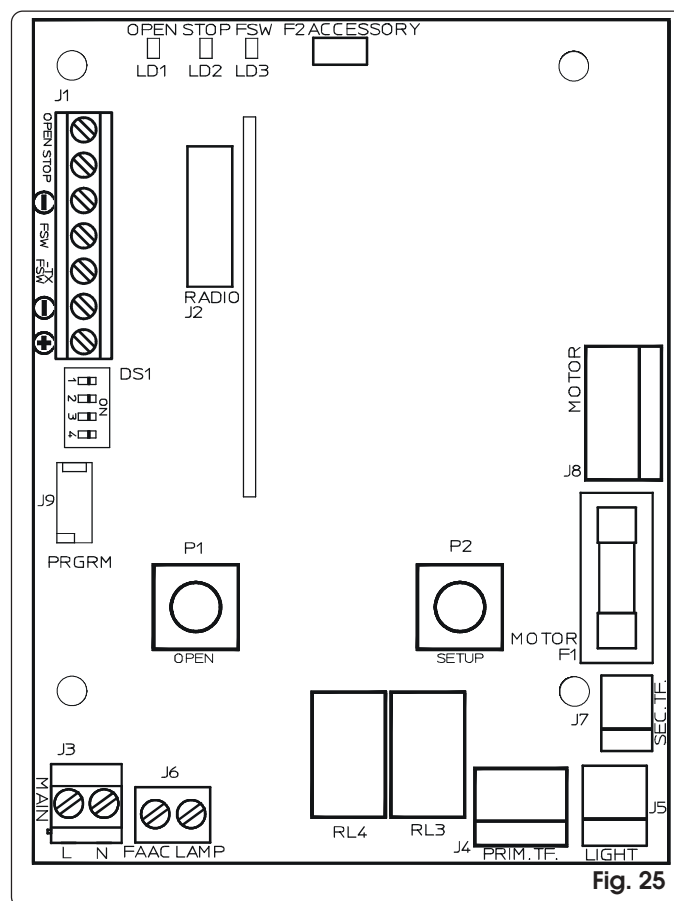


Fig. 25

-TX FSW= Terminal for connection of the negative pole (-) of the photocell transmitter (TX).

CONNECTOR J2 (low voltage)

Connector J2 is used for quick connection of MINIDEC, DECODER, and RP RECEIVER cards.

Insert and remove the cards after disconnecting the power to the operator.

TERMINAL BOARD J3 (high voltage)

Terminal board for 230Vac 50Hz power supply

⊥ on the support plate = Earth fixing screw (fig. 26 ref. A).

TERMINAL BOARD J6 (high voltage)

230Vac terminal board for connection of flasher.

8.3.2. Programming Dip-Switches DS1

No.	Function	OFF	ON
1	Failsafe	Active	Not active
2	Anticrushing sensitivity	Low	High
3	Not used	/	/
4	Carriage speed	High	Low

Failsafe

When activated it enables the photocell function test before any movement.

Anticrushing sensitivity

In the event of doors with an uneven movement, it allows the sensitivity of the anticrushing device to be reduced in order to avoid unwanted activations.

Speed adjustment

If the door movement is too fast or uneven, the slow carriage speed can be selected.

8.3.3. Courtesy light

The courtesy light stays on for 2 minutes from the end of the operation (not modifiable).
 During the self-learning cycle the lamp flashes rapidly (on for one second every two).
 In case of an anomaly in the equipment or if the self-learning cycle does not end correctly, the light flashes slowly (on for two seconds every four).

8.4. CONNECTIONS

IMPORTANT: Always turn the power off before any intervention on the card (connections, programming, maintenance).

The electrical system specifications are given in the chapter "Instructions for the installer".

Always separate power cables from the control cables. To prevent any electrical interference, use separate sheaths.

The operator is equipped with a cable with Shuko plug already wired; if using a different cable make sure to connect the earth to the special anchoring point indicated in fig. 26 ref. A.

For the cable passage, use the arrangement located on the back of the housing. If tubing is used, execute the slot as shown in fig. 26 ref. B.

Carry out the electrical connections, referring to fig. 27. If the **STOP** input is not used, jumper connect the input to the terminal. If the photocells are not used, connect the **FSW** input to the **-TX FSW** terminal.

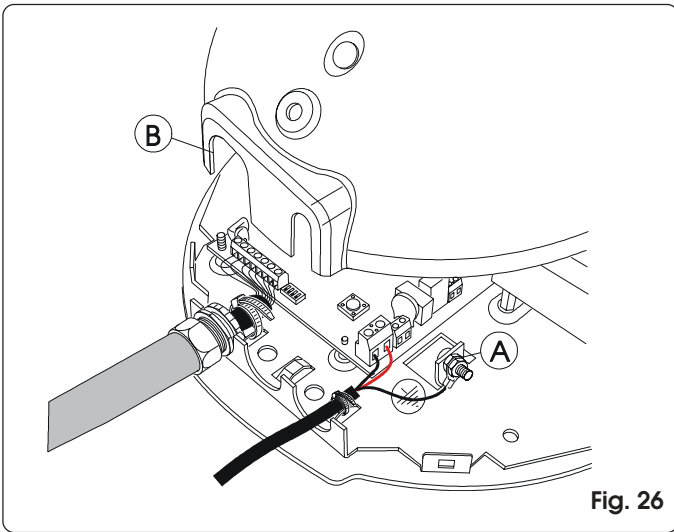


Fig. 26

Input status LEDs

LD	Meaning	Off	On
1	Input status OPEN	Not active	Active
2	Input status STOP	Active	Not active
3	Input status FSW	Safety devices activated	Safety devices deactivated

The status of automatic system stopped and at rest is indicated in bold-face for each input.

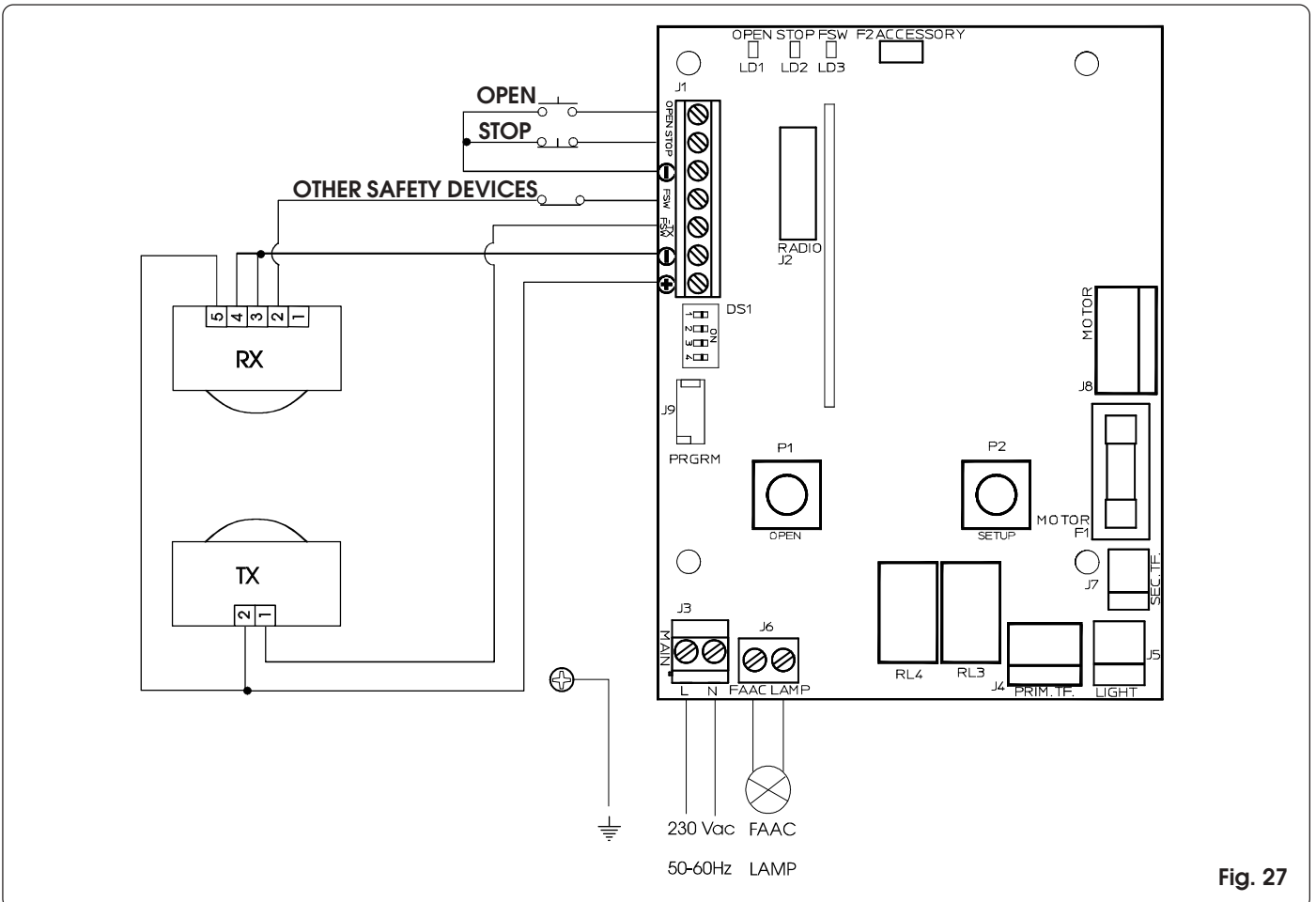


Fig. 27

8.5. PROGRAMMING

8.5.1. Card settings

Carry out the equipment settings by means of the Dip-Switch DS1 to obtain the required operation.

8.5.2. Learning

During the learning procedure, the obstacle detection device is not operating. The STOP command and the closing safety devices (FSW) are active; their intervention causes interruption of the learning and anomaly signalling.

Refit the courtesy light.

The SET-UP cycle can be carried out even with the plastic housing already fitted (fig. 28). To access the programming button, remove the courtesy light ceiling fixture and insert a screwdriver in the special passage (fig. 29). If, on pressing the OPEN pushbutton during the learning phase, the operator does not carry out any movement, check the correct positioning of the housing.

If the SET-UP is carried out without the housing fitted, pay maximum attention not to touch live parts and the courtesy light.

The learning cycle defines:

- the necessary force for moving the door.
- deceleration points.
- door opening and closing stop points.
- pause time (in automatic logic).

Learning can be started with the operator blocked, regardless of the door position.

The procedure also determines the operational logic.

The logic tables gives the behaviour of the automation in the various conditions and following commands or safety device intervention.

Learning can be carried out in automatic or manual mode; in the latter case the deceleration points can be established in opening and closing, whereas in automatic, the equipment independently establishes the movement parameters. If the procedure does not conclude correctly (e.g. due to excessive friction during door movement), the equipment signals the anomaly status (the courtesy light flashes slowly). In this case, the procedure must be repeated after the cause has been eliminated.

AUTOMATIC Logic

DOOR STATUS	OPEN	STOP	SAFETY DEVICES
CLOSED	Opens and closes after the pause time	No effect**	No effect
OPEN FOR PAUSE	Restarts pause time count*	Stops *	Restarts pause time count*
CLOSING	Reverses motion	Stops **	Reverses motion
OPENING	No effect	Stops **	No effect *
STOPPED	Closes	No effect**	No effect *

SEMIAUTOMATIC Logic

DOOR STATUS	OPEN	STOP	SAFETY DEVICES
CLOSED	Open	No effect**	No effect
OPEN	Closes	No effect**	No effect *
CLOSING	Reverses motion	Stops **	Reverses motion
OPENING	Locks	Stops **	No effect *
STOPPED	Closes	No effect**	No effect *

* Prevents closing if pulse is maintained

** Prevents closing and/or opening if pulse is maintained

If the anti-crushing device is tripped during the door opening manoeuvre, it causes the door to stop immediately, whereas, during the closing manoeuvre, it reopens the door.

If, during closure, an obstacle is detected more than three consecutive times, the automated system considers this distance as the new closing contact point and goes into closed status. To restore the correct positions, remove the obstacle and command a new cycle: at the next closure, the automated system will advance at low speed until it detects the closing contact point.

AUTOMATIC LEARNING WITH LOGIC "E" (SEMIAUTOMATIC)

Press the SET-UP pushbutton for 1 second. The courtesy light starts to flash when the button is released.

- 1) After 8 seconds the operator automatically does a closing operation until detecting the ground stop.
- 2) The operator starts the opening movement. Wait until it reaches the opening end travel or effect an OPEN command in the position in which stopping of movement is required.
- 3) The operator closes the door.
- 4) Wait until the door reaches the ground stop and the operator stops.

If the learning procedure was successful the courtesy light stops flashing and stays on for 5 seconds.

During the 5 seconds, in order to reduce the load on the release system, OPEN pulses can be sent within 2 seconds of each other to reverse the carriage. One pulse equals 5 mm travel. N.B.: Carriage reversing is only visible during normal operation of the automatic system.

The electronic equipment establishes the deceleration points.

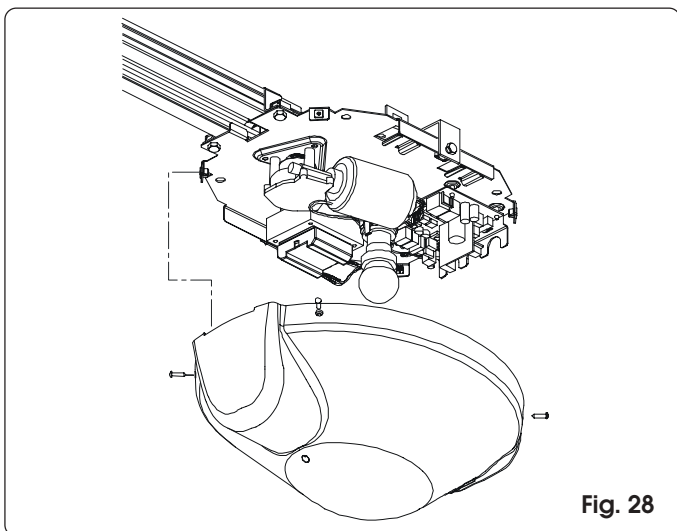


Fig. 28

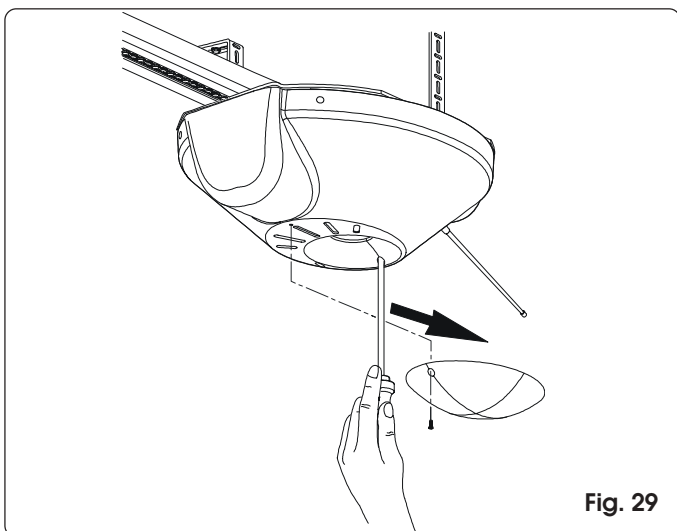


Fig. 29

MANUAL LEARNING WITH LOGIC "E" (SEMI-AUTOMATIC)

Press the SET-UP pushbutton for one second. The courtesy light starts flashing when the button is released. Carry out the following procedure within 8 seconds (otherwise the operator will carry out automatic learning).

- 1) Effect the 1st OPEN command: the operator carries out a closing operation until detecting the ground stop and stops.
- 2) Effect the 2nd OPEN command: the operator carries out an opening movement.
- 3) Effect the 3rd OPEN command to establish the point at which the start of deceleration is required.
- 4) Effect the 4th OPEN command to establish the point of stopping in opening, or wait until the automatic system detects the opening end travel and stops.
- 5) Effect the 5th OPEN command: the automatic system starts the closing movement.
- 6) Effect the 6th OPEN command to establish the point at which the start of deceleration is required.
- 7) Wait until the door reaches the ground stop and the operator stops.

If the learning procedure was successful, the courtesy light stops flashing and remains on for 5 seconds.

During these 5 seconds, in order to reduce the load on the release system, OPEN pulses can be sent within 2 seconds of each other to reverse the carriage. A pulse equals 5 mm travel. N.B.: Carriage reversing is only visible during normal operation of the automatic system.

AUTOMATIC LEARNING WITH LOGIC "A" (AUTOMATIC)

Hold down the SET-UP pushbutton until the courtesy light comes on (approx. 5 seconds). On releasing the button the courtesy light starts flashing.

- 1) After 4 seconds the operator automatically carries out closing until detecting the ground stop.
- 2) The operator moves the door in opening. Wait until it reaches the opening end travel or effect an OPEN command in the position in which stopping of movement is required.
- 3) The operator closes the door.
- 4) Wait until the door reaches the ground stop and the operator stops.

If the learning procedure was successful, the courtesy light stops flashing and remains on for 5 seconds.

During these 5 seconds, in order to reduce the load on the release system, OPEN pulses can be sent within 2 seconds of each other to reverse the carriage. A pulse equals 5 mm travel. N.B.: Carriage reversing is only visible during normal operation of the automatic system.

The electronic equipment establishes the deceleration points. The pause time is set at 3 minutes.

MANUAL LEARNING WITH LOGIC "A" (AUTOMATIC)

Hold down the SET-UP pushbutton until the courtesy light comes on (approx. 5 seconds). On releasing the button the courtesy light starts flashing. Carry out the following procedure within 4 seconds (otherwise the operator carries out automatic SET-UP).

- 1) Effect the 1st OPEN command: the operator carries out a closing operation until detecting the ground stop.
- 2) Effect the 2nd OPEN command: the operator carries out an opening movement.
- 3) Effect the 3rd OPEN command to establish the point at which the start of deceleration is required.
- 4) Effect the 4th OPEN command to establish the point of stopping in opening, or wait until the automatic system detects the opening end travel. After stopping, the count of time when the automatic system is left open begins. This is the pause that will be respected in normal operation (max. 3 minutes).
- 5) Effect the 5th OPEN command: the pause time count is

- stopped and the closing movement starts.
- 6) Effect the 6th OPEN command to establish the point at which the start of deceleration is required.
 - 7) Wait until the door reaches the stop and the operator stops. If the learning procedure was successful, the courtesy light stops flashing and remains on for 5 seconds.

During these 5 seconds, in order to reduce the load on the release system, OPEN pulses can be sent within 2 seconds of each other to reverse the carriage. A pulse equals 5 mm travel.

N.B.: Carriage reversing is only visible during normal operation of automatic system.

ON GROUND MANUAL SETTING OF CONTACT POINT (learning mode)

During the learning phase, the operator seeks the ground stop using the maximum deliverable force (600N). To avoid excessive stress, the stopping point can also be established manually: when the automatic system executes the closing movements, effect an OPEN command when the stop is reached. If the stop commands are incongruous at the first and second closing, the automatic system will signal anomaly status and the learning cycle will have to be repeated.

During normal operation, the automated system in any case searches for the contact point, but it exercises only the force necessary to move the door.

N.B.: at the end of the learning cycle make the automatic system do a complete cycle to allow it to acquire the correct stopping point in closing. After this cycle, if the automation reopens the door again, command its closing.

PRE-FLASHING

The pre-flashing function can be activated and disabled (following an OPEN command, the unit activates the flashing lamp for 5 seconds before it starts the movement). Procedure:

- 1) Press and hold down the SETUP key.
- 2) Press the OPEN key too after about 3 seconds. If the courtesy lamp goes ON, pre-flashing was activated, if instead, it stays OFF, pre-flashing was disabled.
- 3) Release both push-buttons.

9. START-UP

Check the state of the equipment inputs and make sure all the safety devices are correctly connected (the relevant LEDs must be on).

Do a few complete cycles to check correct operation of the automatic system and the accessories connected to it, with

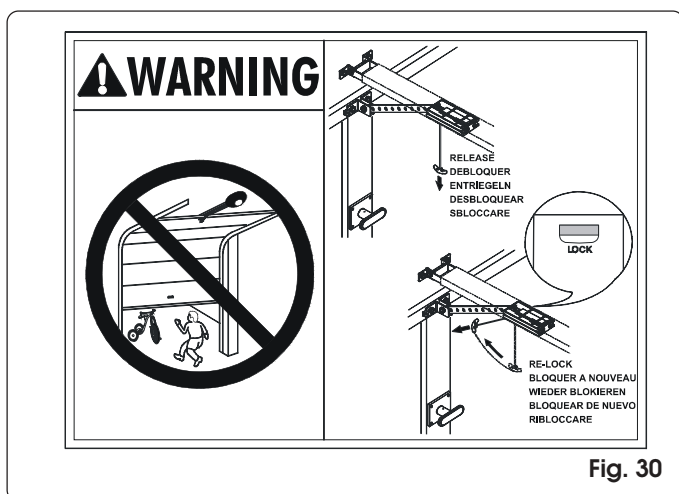


Fig. 30

particular attention to the safety devices and the operator anticrushing device. Check if the automated system is able to detect an obstacle with a height of 50mm laid on the ground. Apply the stickers indicating the release manoeuvre near the automated system. Apply the danger signal sticker (fig. 30), so that it is clearly visible, near to the door or near to the control device.

Give the customer the "User's Guide" page, illustrate system operation and the operator release and lock operations indicated in the Guide.

10. MAINTENANCE

Run a functional check of the system at least every 6 months, with special attention to the efficiency of the safety and release devices.

Once a month: check the efficiency of the anti-crushing device and also check if it is able to detect a 50 mm high obstacle laid on the ground.

11. REPAIRS

For possible repairs, contact authorized FAAC Repair Centres.

12. TROUBLESHOOTING GUIDE

Fault	Possible causes	Cure
When starting the learning system the courtesy light flashes but the automatic system does not carry out any operation.	The STOP and FSW safety devices are active even during the learning phase.. Their incorrect connection or non-connection inhibits operator operation.	Check the status of the LEDs, following the indications given in the "Input LEDs status" tables. Check the connections given in fig. 27
The automatic system does not perform any movement	The STOP command is active	
	The Failsafe function is active but the NC contact of the devices connected to the FSW input does not open during the test performed by the equipment before starting the operation	
The automatic system opens the door but does not close it	The FSW safety devices are activated	
Learning is not correctly terminated and the courtesy light signals an anomaly	The automatic system detects excessive difficulty in door movement	Check door balancing and make sure it moves without excessive friction. Move the door manually using the door bar attachment and make sure movement is smooth without requiring excessive pushing or pulling.
The automatic system executes frequent reversals of motion during opening and/or closing		
Automatic system release is difficult with door closed	The mechanical load on the release system with door closed is excessive	Do a new learning cycle, then reduce the closing thrust commanding carriage reversal as described in par. 8.5.2
The courtesy light signals an anomaly	The learning procedure was unsuccessful.	Do a new learning cycle

13. ACCESSORIES

Use of the safety edge with conductive element is facilitated by the possibility of housing the special control unit (fig. 31) on the operator.

The outside release device can be installed with lever system (fig. 32 ref. A) or key (fig. 32 ref. B).

The central support (fig. 33) offers a central fixing point also for the one-piece sliding guide.

Using the RP receiver, its range can be increased with the special antenna. To install the antenna on the automatic system, drill the housing from the inside in the controlled area (fig. 34) and fix the antenna with the special nut (fig. 35).

Using the RP2 868SLH receiver, the second channel can be used for the STOP command or for activating other devices (e.g. lighting systems) using the free contact output.

The buffer battery kit will activate the automated system in the event of a power cut. The battery is housed in an appropriate enclosure located outside the operator.

For installation, see the instructions for the individual accessories.

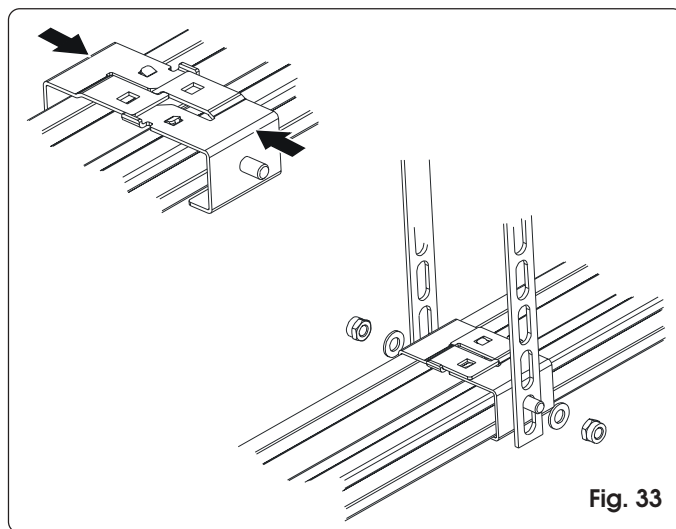


Fig. 33

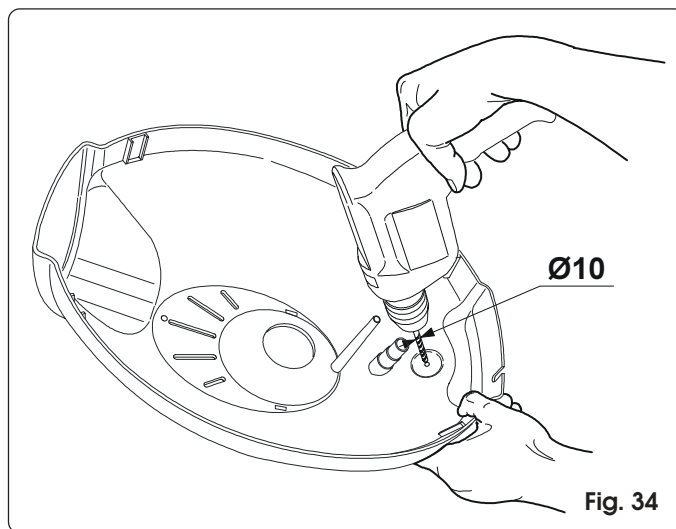


Fig. 34

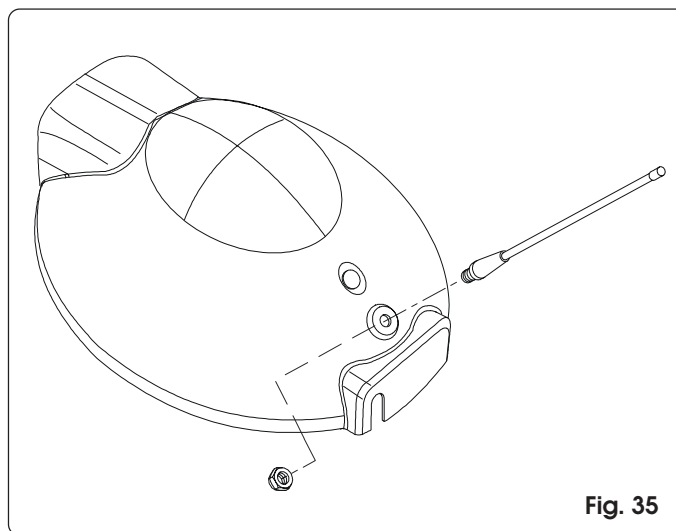


Fig. 35

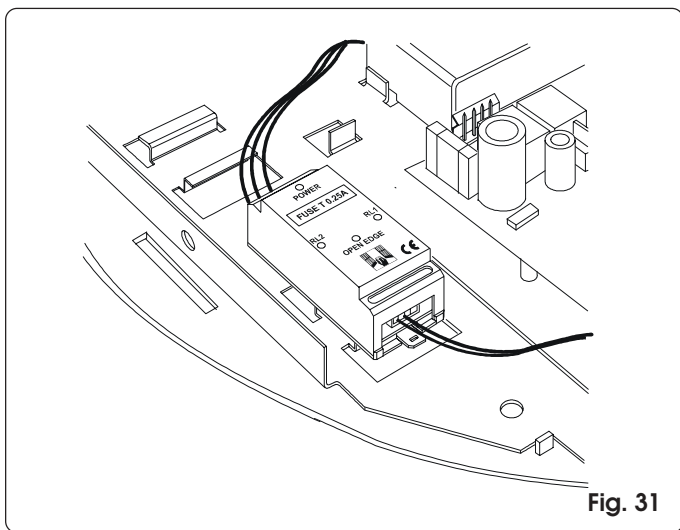


Fig. 31

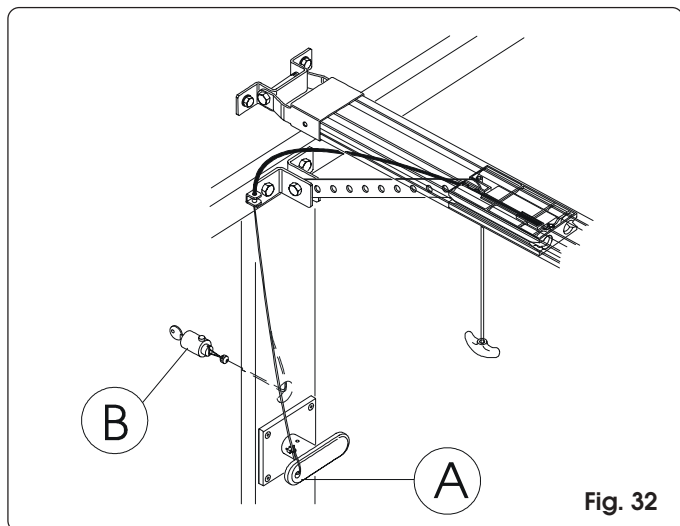


Fig. 32

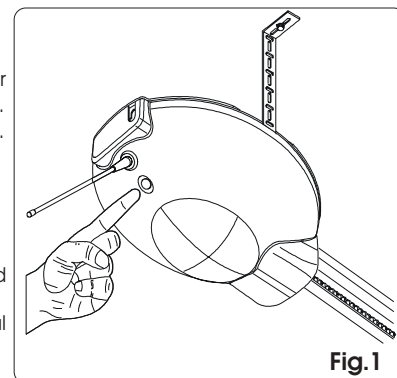
USER'S GUIDE

Carefully read the instructions before using the product and keep them for possible future needs.

GENERAL SAFETY REGULATIONS

When correctly installed and used, the 531EM automatic system ensure a high degree of safety. Some simple rules can also prevent accidental problems:

- Never stand under the door.
- Do not allow children, persons or things near the automatic systems, especially during operation.
- Transit must occur while the door is fully open and with the automated system stopped. Keep the door under control during the entire movement and prevent other people accessing the area involved.
- Keep remote controls or other pulse generators that could open the door, out of reach of children.
- Do not allow children to play with the automatic system.
- Do not deliberately obstruct door movement.
- Prevent any branches or shrubs from interfering with door movement.
- Keep the signalling lights efficient and clearly visible.
- Do not try to manually operate the door without having released it.
- In the event of malfunctions, release the door to allow entry and request the intervention of qualified technical personnel.
- After setting the manual operation mode, switch off the power to the system before restoring normal operation.
- Do not make any modifications to the components of the automatic system.
- Do not attempt any kind of repair or direct intervention; contact qualified FAAC personnel only.
- At least every six months have qualified personnel check the automatic system, safety devices and earth connection.



DESCRIPTION

The 531EM automated system is ideal for automating balanced sectional doors of individual residential garages.

The automatic systems consist of an electromechanical operator, electronic control appliance, courtesy light and protection housing incorporated in a single unit.

The non-reversing system guarantees mechanical door locking when the motor is not operating, therefore no lock is necessary; a manual release allows the door to be moved manually in case of a power failure or malfunction.

The automatic system is equipped with an electronic device for detecting obstacles. If an obstacle is detected during the closing manoeuvre, the automated system fully re-opens the door. If the automated system operates in automatic logic, the door re-closes after the pause time, otherwise, a new pulse will have to be given to command closure. If an obstacle is detected during the opening manoeuvre, this will stop motion (e.g. thus preventing things and people from being lifted). To restore normal operation, give a new opening pulse.

If, during closure, an obstacle is detected in the same position more than three consecutive times, the automated system considers this distance as the new closing contact point and goes into closed status. To restore the correct positions, remove the obstacle and command a new cycle: at the next closure, the automated system will advance at low speed until it detects the closing contact point.

The door is normally closed; when the electronic control unit receives an opening command from the remote control, or from any other type of pulse generator (fig.1), it activates the electric motor which, by means of a chain or belt transmission, opens the door to allow entry.

- If the automatic mode has been set, the door closes automatically after pause time. An opening pulse supplied during opening has no effect.
- If the semiautomatic mode has been set, a second pulse is needed to close the door again.
- An opening pulse during opening stops movement. An opening pulse during re-closing always causes reversal of movement.
- A stop pulse (if supplied) always stops movement.

For details on door behaviour in the different logics, consult the installation Technician.

The automatic systems can include accessories (photocells) that prevent the door from closing when there is an obstacle in the area they control.

Emergency manual opening is possible by means of the special release system.

The indicator light (when provided) signals that the door is moving.

The courtesy light is activated when the motor starts and stays on for about 2 minutes after it stops. If the courtesy light flashes, this means that the automated system is in shut-down status due to a fault, and qualified personnel must be called in to repair.

MANUAL OPERATION

The 531EM operator has an emergency release system which can be activated from the inside; however, by request a lock can be fitted for activating the release also from the outside.

If the door has to be moved manually due to a power failure or a fault in the automatic system, the release device must be used as follows:

- Disconnect the power supply to the system.
- Release the operator, by pulling the release handle downward (fig. 2 ref. A).

Attention: make sure that there are no persons, animals or objects in the door movement area during the release manoeuvre.

RESTORING AUTOMATIC OPERATION

- Re-lock the automatic system by pulling the handle sideways (fig. 2 ref. B) and, on release, make sure the "LOCK" indication window under the carriage is red, confirming correct reset.
- Move the door until locating the coupling point.
- Switch the power on to the system.

MAINTENANCE

The 531EM automated system does not require any periodic replacement of parts.

Once a month: check if the anti-crushing system is able to detect the presence of a 50mm high obstacle laid on the ground.

LAMP REPLACEMENT

To replace the lamp, unscrew and remove the ceiling fixture support screw.

Slide the ceiling fixture in the direction shown by the arrow (fig. 3) and replace the lamp (type 230Vac max 25W).

