

# IMPORTANT NOTICE FOR THE INSTALLER

## GENERAL SAFETY REGULATIONS

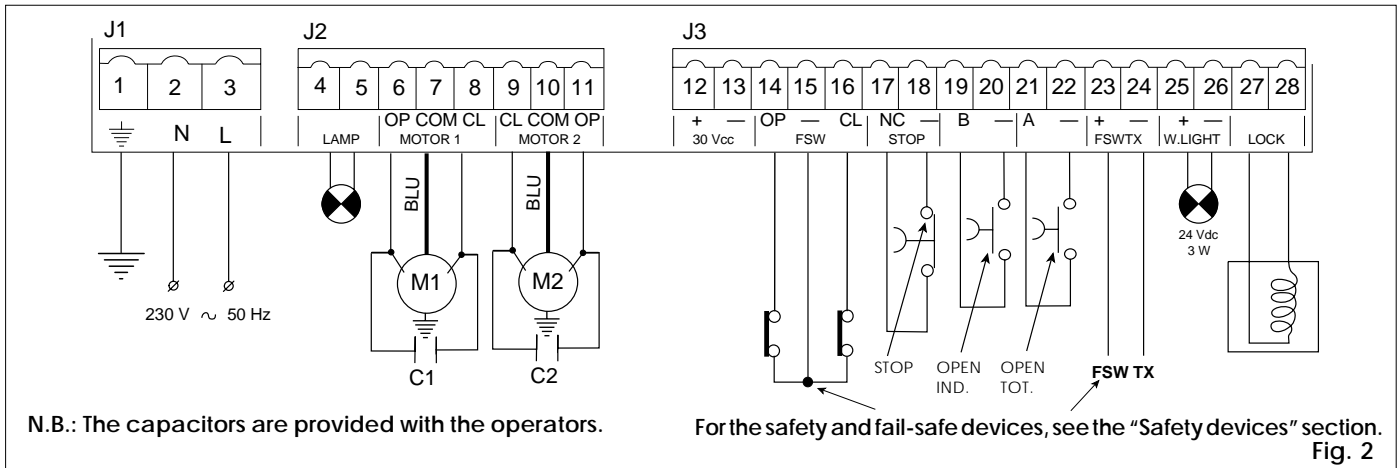
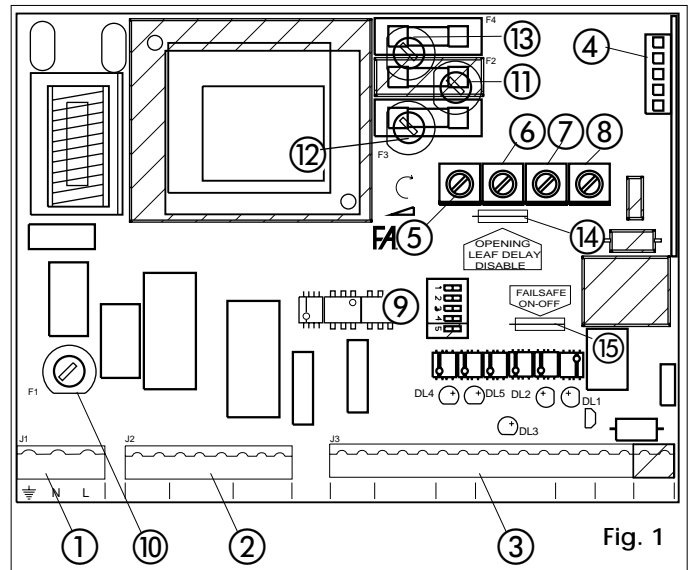
- 1) **WARNING! FAAC strongly recommends to follow these instructions literally for the safety of persons. Improper installation or misuse of the product will cause very serious damages to persons.**
- 2) Packaging material (plastic, polystyrene etc.) is a potential hazard and must be kept out of reach of children.
- 3) Read the instructions carefully before installing the product.
- 4) Keep these instructions for future reference.
- 5) This product has been designed and manufactured only for the use stated in this manual. Any other use not expressly set forth will affect the reliability of the product and/or could be source of hazard.
- 6) FAAC S.p.A. cannot be held responsible for any damage caused by improper use or different from the use for which the automation system is destined to.
- 7) Do not use this device in areas subject to explosion: the presence of flammable gas or fumes is a serious hazard.
- 8) Mechanical constructive elements must comply with UNI8612, CEN pr EN 12604 and CEN pr EN 12605 standards.  
Countries outside the EC shall follow the regulations above besides their national normative references in order to offer the utmost safety.
- 9) FAAC cannot be held responsible for failure to observe technical standards in the construction of gates and doors, or for any deformation of the gates which may occur during use.
- 10) Installation must comply with UNI8612, CEN pr EN 12453 and CEN pr EN 12635.  
The degree of safety of the automation must be C+E.
- 11) Before carrying out any operations, turn off the system's main switch.
- 12) An omnipower switch shall be provided for the installation with an opening distance of the contacts of 3 mm or more. Alternatively, use a 6A thermomagnetic breaker with multi-pole switching.
- 13) Ensure that there is a differential switch up-line of the electrical system, with a trip threshold of 0.03A.
- 14) Check that the earthing plant is in perfect condition and connect it to the metallic parts. Also earth the yellow/green wire of the operator.
- 15) The automation is fitted with an anti-crush safety system that is a torque control device. In any case, further safety devices shall be installed.
- 16) The safety devices (e.g. photocells, safety edges, etc.) protect areas wherethere is a mechanical movement hazard, e.g. crushing, entrapment and shearing.
- 17) Each installation must be fitted with at least one flashing light (e.g. FAAC LAMP, MINILAMP etc.) as well as a warning plate suitably fixed to the gate, besides the safety devices as per point 16. above.
- 18) FAAC cannot be held responsible regarding safety and correct functioning of the automation in the event that parts other than FAAC original parts are used.
- 19) Use only FAAC original spare parts for maintenance operations.
- 20) Do not carry out any modifications to automation components.
- 21) The installer must supply all information regarding manual operation of the system in the event of an emergency and provide the end-user with the leaflet attached to the product.
- 22) Keep out of persons when the product is in operation.
- 23) Keep out of reach of children the remote radio controls and any control devices. The automation could be operated unintentionally.
- 24) The end-user must avoid any attempt to repair or adjust the automation personally. These operations must be carried out exclusively by qualified personnel.
- 25) **What is not explicitly stated in these instructions is not permitted.**

DESCRIPTION AND TECHNICAL SPECIFICATIONS

Table 1: 450 MPS Control unit technical specifications

Power supply	230 V(+6%-10%) - 50 Hz
Absorbed power	10 W
Max. motor load	800 W
Max. accessories load	0,5 A
Max. electric lock load	12 VA
Temperature range	-20 °C +55 °C
Fuses	N. 4 (see fig.1)
Operations logics	Automatic / Semi-automatic / Safety / Dead-man Automatic timer/ button / Step-by-step semi-automatic
Opening/closing time	Adjustable by trimmer (from 0-120 s)
Pause time	Adjustable by trimmer (from 0-240 s)
Closing leaf delay time	Adjustable by trimmer (from 0 -28 s)
Opening leaf delay time	2.5 s (Can be disabled through bridge)
Thrust force	Adjustable by trimmer
Terminal block inputs	Open/Open single leaf/Stop/Opening safeties/Closing safeties/ mains power +earth
Terminal block outputs	Flashing light - motors - 24 Vdc accessories power supply - 24 Vdc warning light power supply - 12 Vac electric lock power supply
Quick connector	Decoding cards - RP 433 SL/DS
Microswitch programmable functions	Operating logics - Reversing stroke for electric lock - Closing safeties logics

LAYOUT AND ELECTRICAL WIRING



**Caution:** Before touching the electronic unit (connections, programming, maintenance) always switch off the power supply.

① J1 terminal block (fig. 2)

- ⏏ : Earth connection
- N. : power supply 230 V~ ( Neutre )
- L. : power supply 230 V~ ( Phase )

**N.B.:** For correct operation the card must be connected to the system's earth. Install a suitable differential magneto-thermal circuit-breaker upstream of the system.

② J2 terminal block (fig. 2)

- LAMP.:** flashing light output ( 230 V ~ )
- MOTOR 1** Open /Common/ Close: Motor 1 connection  
**Can be used in one-leaf application.**  
**(leaf closing delay)**
- MOTOR 2** Close /Common/ Open: Motor 2 connection  
**Not to be used in one-leaf application.**

**N.B.** To check the operation of the equipment at the test bench, a load must be connected on the MOTOR 1 input.

③ J3 terminal block: low voltage (fig. 2) used to connect all accessories (see table 2).

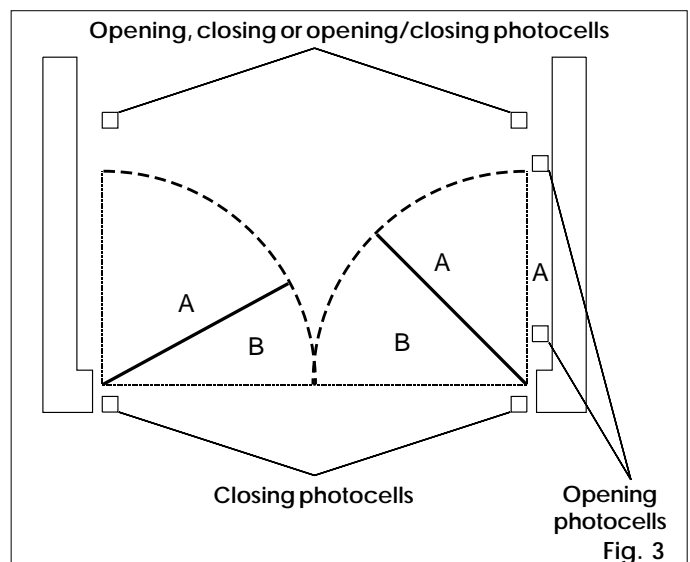
**30 Vdc**

- accessories power supply negative
- + accessories power supply positive (+ 30 Vdc)

**Warning:** the max. accessory load is 500 mA. To calculate absorption values, refer to table 2.

**Safety devices**

These are all devices (photocells, safety edges, magnetic coils, etc.) with an N.C. (normally closed) contact which activate if an obstacle obstructs the area protected by the



safety devices and stop the movement of the gate leaves (fig. 3).

The 450 MPS card has an additional FAIL-SAFE device which serves to check that the N.C. contact on the photocell receiver is working efficiently before any operation (Can be disabled through bridge Fig. 1 ref.15) .

**N.B.:** If the **Opening safety devices** are engaged when the gate is closed, they prevent the leaves from opening.

If the **Closing safety devices** are engaged when the gate is open, they prevent the leaves from closing.

**OP. - Opening safety device contact (N.C.):** in the **A-S-E-EP-AD** logics, during the opening phase the safety devices stop the movement of the gate leaves; when they are disengaged the opening movement recommences. They do not engage during closure.

In the **B, C** and **B/C** logics, they interrupt movement during the opening cycle. They do not engage during the closing cycle.

**N.B.:** If opening safety devices are not connected, jumper inputs **OP** and **FSW TX** (Fig. 4).

The purpose of the opening safety devices is to safeguard the zone behind the gate leaves (A, fig. 3).

**CL. - Closing safety device contact (N.C.):** in the **A-S-E-EP-AD** logics, during the closing phase the safety devices reverse the direction of movement of the gate leaves, or they stop the movement of the leaves then reverse direction when they are disengaged (see microswitch **SW4** settings). They do not engage during the opening cycle.

In **B, C** and **B/C** logics, they interrupt movement during the closing cycle. They do not engage during the opening cycle.

**N.B.:** If closing safety devices are not connected, jumper inputs **OP** and **FSW TX** (fig. 4).

The purpose of the closing safety devices is to safeguard the zone in which the leaves move during the closing cycle (B, fig. 3).

If the Fail-Safe function is not used, see cabling at page 4 for connections of photocells.

**Application examples**

The following are the commonly used connection arrangements (enable fail-safe):

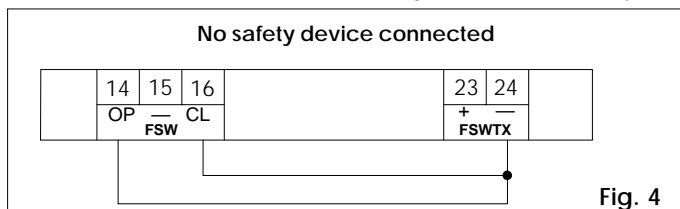


Fig. 4

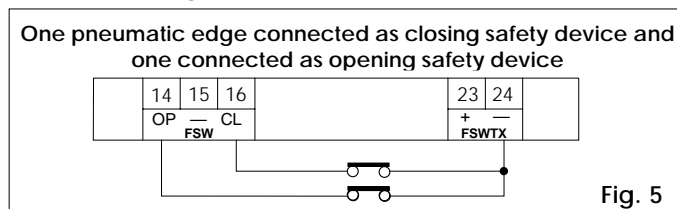


Fig. 5

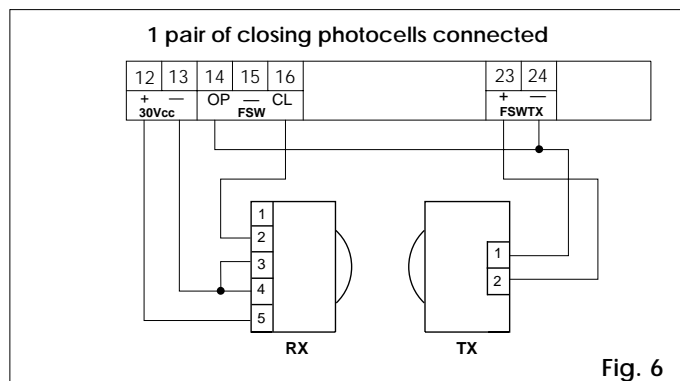


Fig. 6

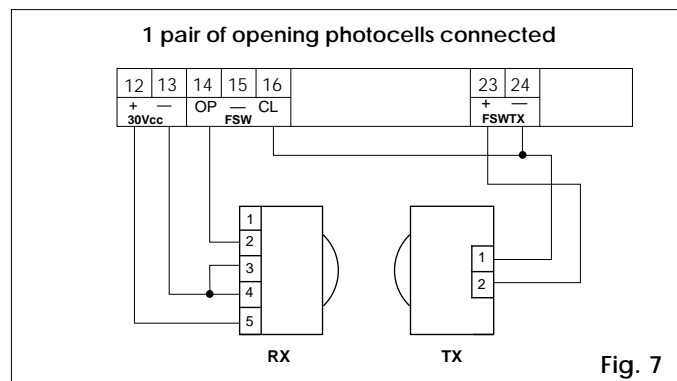


Fig. 7

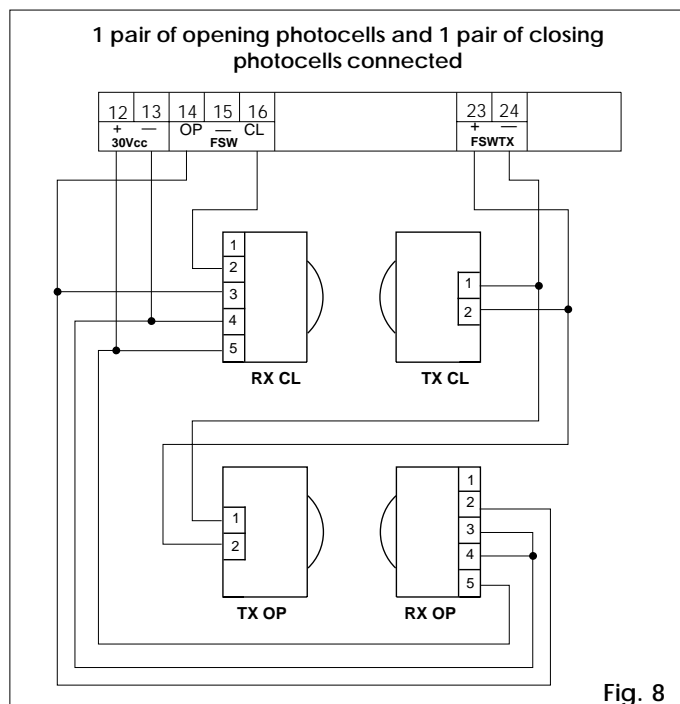


Fig. 8

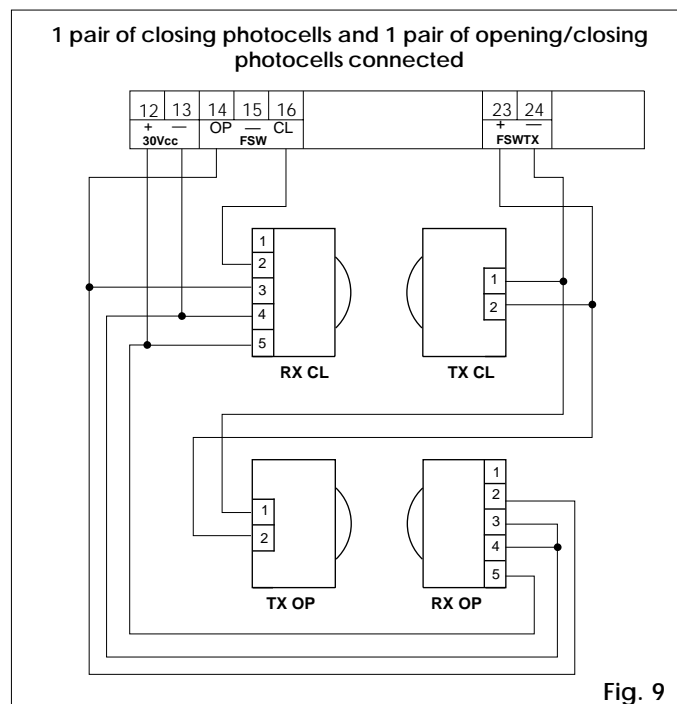
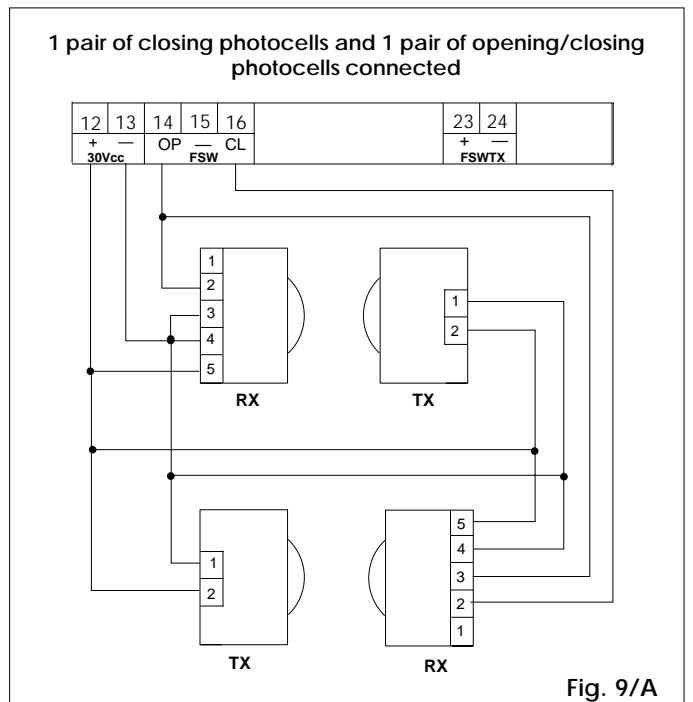
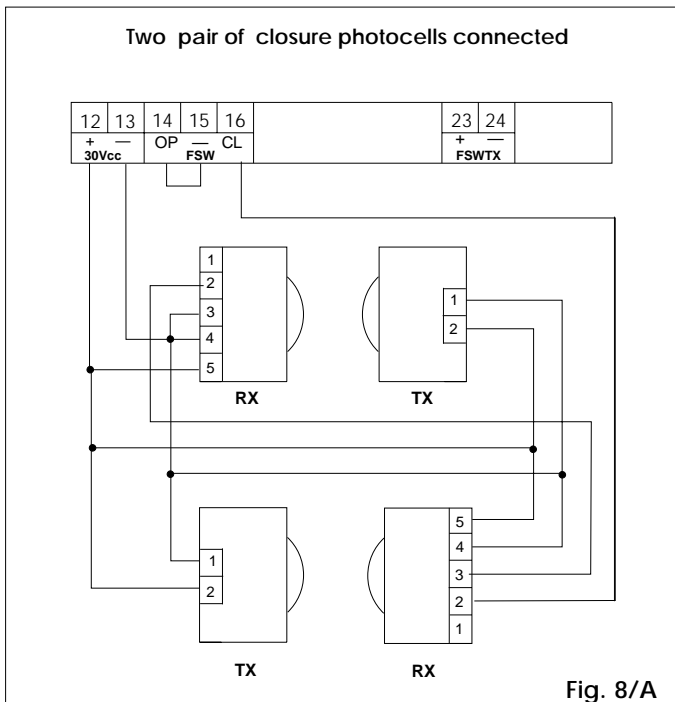
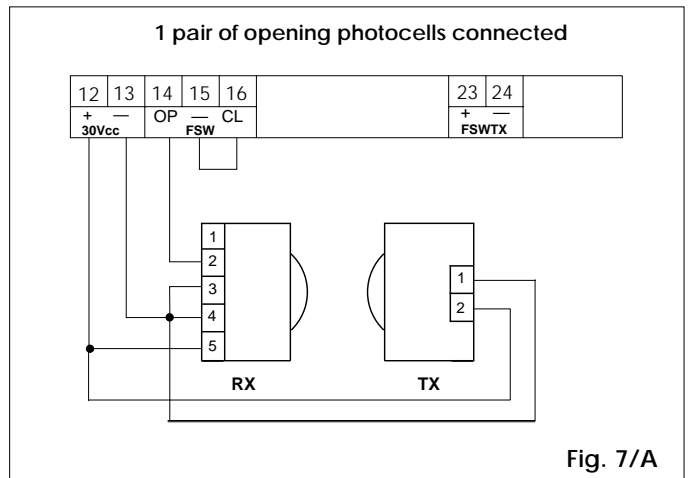
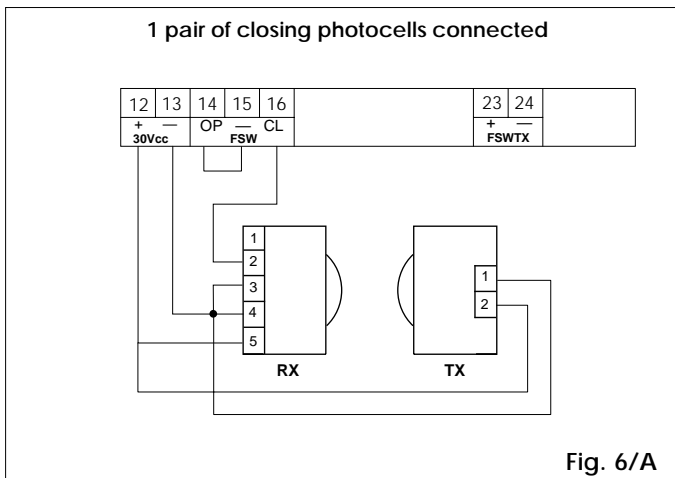
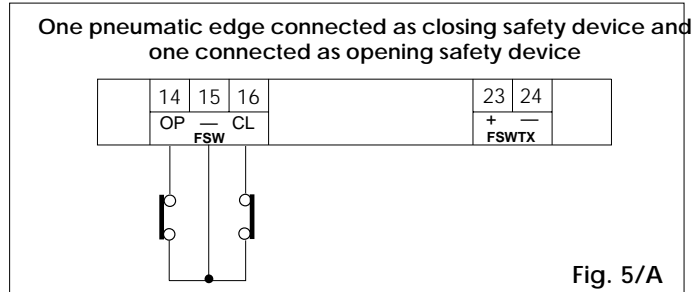
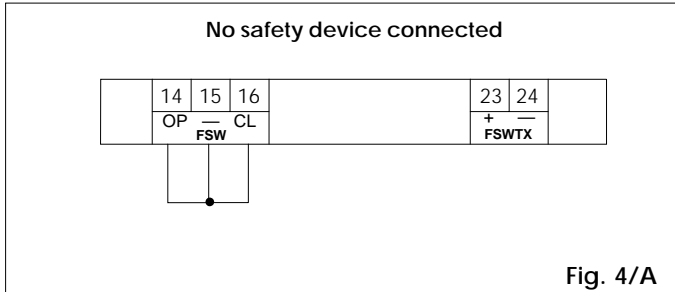


Fig. 9

**Important:** for further information on the operation of the safety devices, see table 3.

**Application examples**

The following are the commonly used connection arrangements (**disable fail -safe**)



**STOP**

- Common (-)

**N.C. - STOP contact:** all devices (such as pushbuttons) which by opening a contact stop gate movement. To install several safety stop devices, connect the N.C. contacts in series.

**N.B.** If the STOP devices are not connected, jumper **STOP** and - inputs.

**B - SINGLE LEAF OPENING (N.O.):** all devices (e.g. pushbutton) which, by closing a contact activates opening and/or closing of the leaf driven by motor 1.

- Common (-)

**A - TWO-LEAF OPENING (N.O.):** all devices (pushbuttons, photocells, detectors, etc.) which assures opening/closing of both leaves by closing a contact.

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

**FSWIX**

+ - Photocell transmitter power supply (FailSafe)

To use the Fail-Safe function, power supplies to the photocell transmitters must be connected.

**W.LIGHT**

+ - Warning lamp power supply 24 Vdc 3 W max.

For correct operation of the system, **do not exceed** stated power (see table 2).

**LOCK**

12 Vac electric lock power supply.

④ **J4 quick connector** for decoder SL/DS - MINIDEC SL/DS - RP 433 SL/DS cards (figs. 10-11-12-13)

⑤ **TORQUE trimmer:** thrust adjusting trimmer (anti-crushing safety system).

⑥ **PAUSE trimmer:** pause time adjusting trimmer (A/S/AD logics). Pause time is adjustable from 0 to 240 seconds.

⑦ **OP/CL trimmer:** Opening/Closing time adjusting trimmer. Time is adjustable from 0 to 120 seconds.

⑧ **LEAF DELAY trimmer:** closing leaf delay adjusting trimmer. Leaf delay time is adjustable from 0 to 28 seconds.

**N.B.:**

1) If the opening/closing time is less than the set delay time, the delayed leaf closes at the end of the closing time.

2) In one-leaf application, set the leaf delay time to minimum

⑨ **Programming microswitches**

⑩ **Fuse F1 5x20 5 A/250 V rapid (motor power supply)**

⑪ **Fuse F2 5x20 800 mA/250 V delayed (accessories power supply)**

⑫ **Fuse F3 5x20 1.6 A/250 V delayed (electric power supply)**

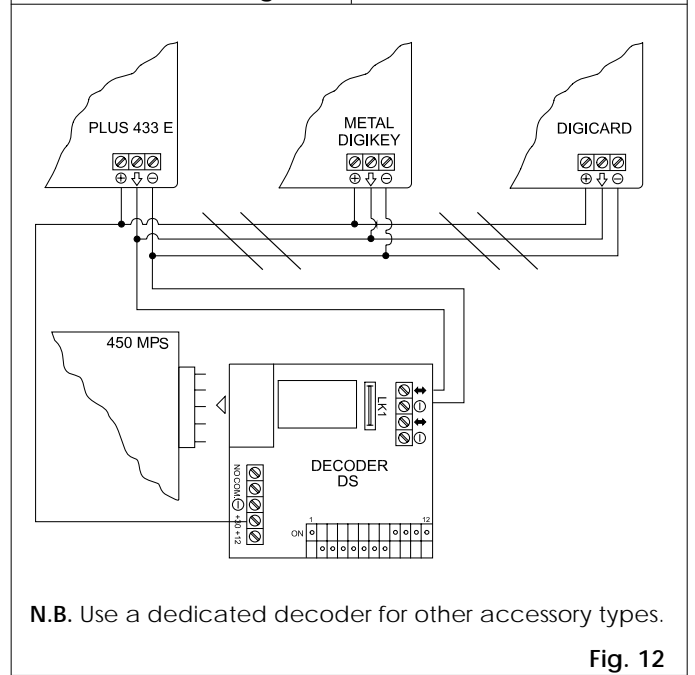
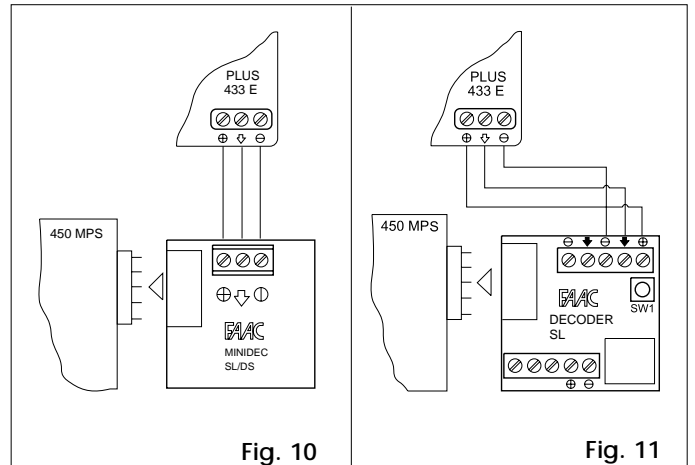
⑬ **Fuse F4 5x20 250 mA/250 V delayed (transformer power supply)**

⑭ **Bridge to enable/disable the Fail-Safe (Fig. 14).**

⑮ **Bridge to enable/disable the wing opening delay (Fig. 14).**

Table 2 - Current drawn by accessories

ACCESSORY	CURRENT DRAWN
PLUS 40 SL	30 mA
PLUS 433 E	20 mA
MINIDEC SL / DS	6 mA
DECODER SL / DS	20 mA / 55 mA
RP 433 SL / DS	12 mA / 6 mA
DIGICARD	15 mA
METAL DIGIKEY	15 mA
FOTOSWITCH	90 mA
DETECTOR F4 / PS6	50 mA
PHOTOBEAM	50 mA
WARNING LIGHT	150 mA



**N.B.** Use a dedicated decoder for other accessory types.

Fig. 12

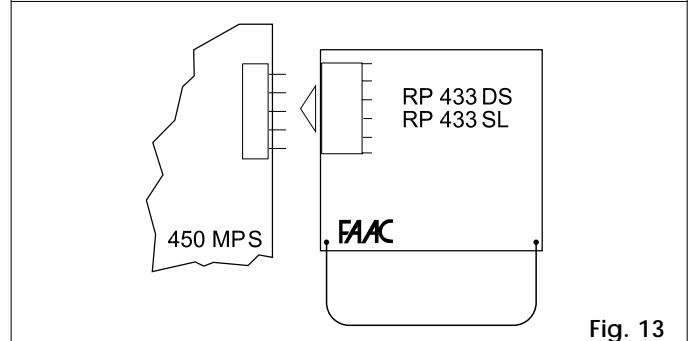
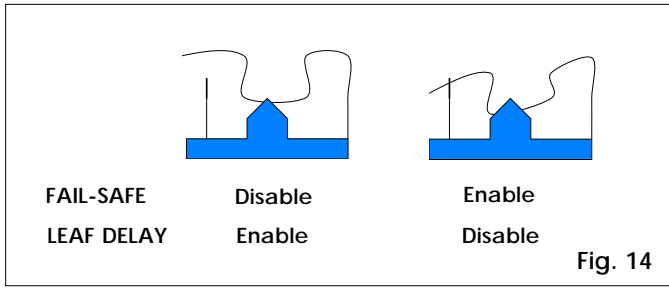
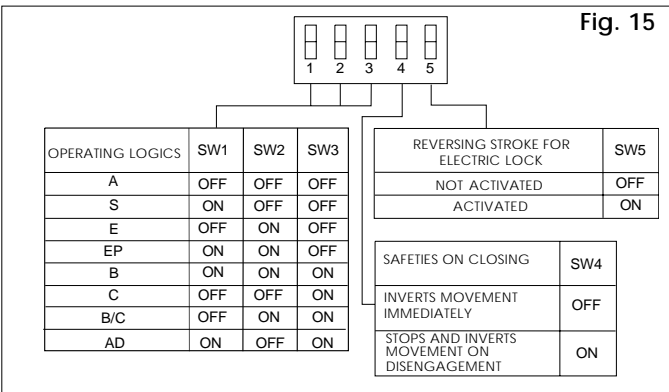


Fig. 13



**1. PROGRAMMING THE MICROSWITCHES**

Automation programming is carried out by the microswitches (fig. 1 - ref. 9) as shown in the diagram below.



**1.1. OPERATION LOGICS**

There are seven operating logics available:

- A : "AUTOMATIC"                      E : "SEMI-AUTOMATIC"
- S : "SAFETY"                            EP : "SEMI-AUTOMATIC STEP-BY-STEP"
- B : "DEAD-MAN BUTTON"    C : "DEAD-MAN BUTTON"
- B/C : "DEAD-MAN BUTTON"    AD : "AUTOMATIC TIMER"

Operation of the different logics is described in tables 3/a-b-c-d-e-f-g-h.

**1.2. REVERSING STROKE FOR ELECTRIC LOCK**

This function is to be activated only if the electric lock is installed.

**1.3. SAFETIES ON CLOSING**

This function serves to select the operating mode for the closing safeties:

- OFF: immediate reverse of movement during gate closure
- ON: movement is stopped during closing and reversed on opening when the safety is disengaged.

**2. START-UP**

- 1) Program the 450 MPS electronic control unit according to specific requirements as shown in fig. 14.
- 2) Check led status as shown in table.

**LED functions**

LEDS	ON	OFF
DL 1 (OPEN INPUT A)	Command active	<b>Command not active</b>
DL 2 (OPEN INPUT B)	Command active	<b>Command not active</b>
DL 3 (STOP)	<b>Command not active</b>	Command active
DL 4 (FTSW OPEN)	<b>Safeties disengaged</b>	Safeties engaged
DL 5 (FTSW CLOSE)	<b>Safeties disengaged</b>	Safeties engaged

**N.B.:** the bold text indicates led status with gate idle.

**2.1. DIRECTION OF ROTATION**

- 1) Switch off the power.
- 2) Manually move the gate to halfway.
- 3) Lock the operators.

- 4) Switch on the power.
- 5) Send an OPEN signal to input A (fig. 2) and check that the leaf opens.

If the gate closes, invert the motor wires on the control unit (brown and black wires).

**2.2. OPERATION TIME ADJUSTMENT**

Opening/closing times are set by the OP/CL trimmer on the control unit (fig. 1 - ref.7).

To reduce operation time, adjust the trimmer anticlockwise  
To increase operation time, adjust the trimmer clockwise.

Maximum operation time is 120 seconds.

For 90° opening the approximate opening/closing time is 18 seconds.

For optimal system efficiency set the opening/closing time so that the electric motor remains activated for a few seconds after the leaf has reached the mechanical travel stop.

**2.3. CLOSING LEAF DELAY ADJUSTMENT**

In the case of overlapping leaves, it is possible to delay closing of the leaf driven by motor M1 (see fig. 2) to ensure correct closure of the gate.

Set the delay by the LEAF DELAY trimmer on the 450 MPS control unit (fig. 1 - ref. 8).

To reduce delay time, adjust the trimmer anticlockwise.

To increase delay time, adjust the trimmer clockwise.

Maximum delay time is 28 seconds. If the operation time is shorter, the delay time is reduced automatically.

**2.4. SETTING PAUSE TIME**

When A or S logics are selected, the leaf momentary stop time can be set using the PAUSE trimmer (fig. 1 ref. 6).

Turn the trimmer clockwise to increase the time.

Turn the trimmer anticlockwise to reduce the time.

The maximum pause time is 240 sec.

**2.5. ANTI-CRUSHING SYSTEM ADJUSTMENT**

The 450 MPS control unit has been designed for use on both electromechanical and hydraulic operators.

When the 450 MPS card is used on electromechanical operators, the torque control device must be set by turning the TORQUE trimmer (fig. 1 ref. 5).

To reduce torque, adjust the trimmer anticlockwise.

To increase torque, adjust the trimmer clockwise.

In any event, FAAC advises not to exceed a torque of 15 Kg measured on the outer edge of the leaf.

To ensure precise torque adjustment use a linear dynamometer.

When the 450 MPS card is used on hydraulic operators, the torque control device must be set to the maximum value by turning the TORQUE trimmer clockwise.

This device is already present inside the operator hydraulic circuit (BY-PASS valves).

Table 3/a

LOGICS "A"		PULSES					W.L.
GATE STATUS	OPEN-A	OPEN-B	STOP	OPENING SAFETIES	CLOSING SAFETIES	OPENING/CLOSING SAFETIES	W.L.
CLOSED	Opens leaves and recloses after pause time	Opens single leaf and re-closes after pause time	No effect (OPEN inhibited)	No effect (OPEN inhibited)	No effect	No effect (OPEN inhibited)	off
OPEN on PAUSE	Recloses leaves immediately	Recloses leaf immediately	Stops	No effect	Freezes pause until disengagement (*) (OPEN inhibited)	Stops closing and, when disengaged, opens	on
CLOSING	Reopens leaves immediately	Reopens leaf immediately		No effect (OPEN inhibited)	See paragraph 1.3	Stops closing and, when disengaged, opens	flashing light
OPENING	No effect	Reopens leaf immediately	Stops opening and, when disengaged, closes	No effect	No effect	Stops opening and, when disengaged, continues to open	on
STOPPED	Closes the leaf/leaves		No effect (OPEN inhibited)	No effect	No effect (OPEN inhibited)	No effect (OPEN inhibited)	on

Table 3/b

LOGICS "S"		PULSES					W.L.
GATE STATUS	OPEN-A	OPEN-B	STOP	OPENING SAFETIES	CLOSING SAFETIES	OPENING/CLOSING SAFETIES	W.L.
CLOSED	Opens leaves and recloses after pause time	Opens single leaf and recloses after pause time	No effect (OPEN inhibited)	No effect (OPEN inhibited)	No effect	No effect (OPEN inhibited)	off
OPEN on PAUSE	Recloses leaves immediately	Recloses leaf immediately	Stops	No effect	Freezes pause until disengagement (*) (OPEN inhibited)	Stops closing and, when disengaged, opens	on
CLOSING	Reopens leaves immediately	Reopens leaf immediately		No effect (OPEN inhibited)	See paragraph 1.3	Stops closing and, when disengaged, opens	flashing light
OPENING	Recloses leaves immediately	Recloses leaf immediately	Stops opening and, when disengaged, closes	No effect	No effect	Stops opening and, when disengaged, continues to open	on
STOPPED	Closes the leaf/leaves		No effect (OPEN inhibited)	No effect	No effect (OPEN inhibited)	No effect (OPEN inhibited)	on

Table 3/c

LOGICS "E"		PULSES					W.L.
GATE STATUS	OPEN-A	OPEN-B	STOP	OPENING SAFETIES	CLOSING SAFETIES	OPENING/CLOSING SAFETIES	W.L.
CLOSED	Opens leaves	Opens single leaf	No effect (OPEN inhibited)	No effect (OPEN inhibited)	No effect	No effect (OPEN inhibited)	off
OPEN	Recloses leaves immediately	Recloses leaf immediately	Stops	No effect	No effect (OPEN inhibited)	Stops closing and, when disengaged, opens	on
CLOSING	Reopens leaves immediately	Reopens leaf immediately		No effect (OPEN inhibited)	See paragraph 1.3	Stops closing and, when disengaged, opens	flashing light
OPENING	Stops	Stops	Stops opening and, when disengaged, closes	No effect	No effect	Stops opening and, when disengaged, continues to open	on
STOPPED	Closes the leaf/leaves		No effect (OPEN inhibited)	No effect	No effect (OPEN inhibited)	No effect (OPEN inhibited)	on

Table 3/d

LOGICS "EP"		PULSES					W.L.
GATE STATUS	OPEN-A	OPEN-B	STOP	OPENING SAFETIES	CLOSING SAFETIES	OPENING/CLOSING SAFETIES	W.L.
CLOSED	Opens leaves	Opens single leaf	No effect (OPEN inhibited)	No effect (OPEN inhibited)	No effect	No effect (OPEN inhibited)	off
OPEN	Recloses leaf/leaves immediately	Recloses leaf/leaves immediately	Stops	No effect	No effect (OPEN inhibited)	Stops closing and, when disengaged, opens	on
CLOSING	Stops	Stops		No effect (OPEN inhibited)	See paragraph 1.3	Stops closing and, when disengaged, opens	flashing light
OPENING	Stops	Stops	Stops opening and, when disengaged, closes	No effect	No effect	Stops opening and, when disengaged, continues to open	on
STOPPED	Inverts the direction		No effect (OPEN inhibited)	No effect (if the gate must open, inhibits OPEN)	No effect (if gate must close, inhibits OPEN)	No effect (OPEN inhibited)	on

Table 3/e

LOGICS "B"						
PULSES						
GATE STATUS	OPEN-A	OPEN-B	STOP	OPENING SAFETIES	CLOSING SAFETIES	W.L.
CLOSED	Opens the leaf/leaves	Closes the leaf/leaves	No effect (OPEN A/B inhibited)	No effect (OPEN-A inhibited)	No effect (OPEN-B inhibited)	off
OPEN	Opens the leaf/leaves	Closes the leaf/leaves	No effect (OPEN A/B inhibited)	No effect (OPEN-A inhibited)	No effect (OPEN-B inhibited)	on
CLOSING	No effect	No effect	Stops	No effect	Interrupts operation (OPEN-B inhibited)	flashing light
OPENING	No effect	No effect		Interrupts operation (OPEN-A inhibited)	No effect	on
STOPPED	Opens leaves or 1 leaf	Closes leaves or 1 leaf	No effect (OPEN A/B inhibited)	No effect (OPEN-A inhibited)	No effect (OPEN-B inhibited)	on

Table 3/f

LOGICS "B/C"						
OPENING PULSE/HOLD TO RUN CONTROL						
GATE STATUS	OPEN-A	OPEN-B	STOP	OPENING SAFETIES	CLOSING SAFETIES	W.L.
CLOSED	Opens the leaf/leaves	Closes the leaf/leaves	No effect (OPEN A/B inhibited)	No effect (OPEN-A inhibited)	No effect (OPEN-B inhibited)	off
OPEN	Opens the leaf/leaves	Closes the leaf/leaves	No effect (OPEN A/B inhibited)	No effect (OPEN-A inhibited)	No effect (OPEN-B inhibited)	on
CLOSING	No effect	No effect	Stops	No effect	Interrupts operation (OPEN-B inhibited)	flashing light
OPENING	No effect	No effect		Interrupts operation (OPEN-A inhibited)	Interrupts operation (OPEN-A/B inhibited)	on
STOPPED	Opens leaves or 1 leaf	Closes leaves or 1 leaf	No effect (OPEN A/B inhibited)	No effect (OPEN-A inhibited)	No effect (OPEN-B inhibited)	on

Table 3/g

LOGICS "C"						
HOLD-TO-RUN CONTROLS						
GATE STATUS	OPEN-A	OPEN-B	STOP	OPENING SAFETIES	CLOSING SAFETIES	W.L.
CLOSED	Opens the leaf/leaves	Closes the leaf/leaves	No effect (OPEN A/B inhibited)	No effect (OPEN-A inhibited)	Interrupts operation (OPEN-B inhibited)	off
OPEN	Opens the leaf/leaves	Closes the leaf/leaves	No effect (OPEN A/B inhibited)	No effect (OPEN-A inhibited)	Interrupts operation (OPEN-B inhibited)	on
CLOSING	No effect	No effect	Stops	No effect	Interrupts operation (OPEN-B inhibited)	flashing light
OPENING	No effect	No effect		Interrupts operation (OPEN-A inhibited)	Interrupts operation (OPEN-A/B inhibited)	on

Table 3/h

LOGICS "AD"						
PULSES						
GATE STATUS	OPEN-A	OPEN-B	STOP	OPENING SAFETIES	CLOSING SAFETIES	W.L.
CLOSED	Opens leaves and recloses after pause time	Opens single leaf and re-closes after pause time	No effect (OPEN inhibited)	No effect	No effect	off
OPEN on PAUSE	It controls the re-counting of the pause time	It controls the re-counting of the pause time		No effect	Freezes pause until disengagement (*1) (OPEN inhibited)	on
CLOSING	Reopens leaves immediately	Reopens leaf immediately	Stops	No effect (OPEN inhibited)	See paragraph 1.3	flashing light
OPENING	If held, it remains in pause (timer function).	Reopens leaf immediately		Stops opening and, when disengaged, closes	No effect	on
STOPPED	Closes the leaf/leaves		No effect (OPEN inhibited)	No effect	Stops opening and, when disengaged, continues to open	on

(\*1) If residual pause time is less than 5 seconds on safety disengagement, the gate closes after 5 seconds.

N.B.: Effects of other active impulse inputs are shown in brackets