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CE DECLARATION OF CONFORMITY

Manufacturer: FAAC S.p.A.

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

Declares that: Control unit mod. **E604 24V**

- conforms to the essential safety requirements of the following EEC directives:
73/23/EEC and subsequent amendment 93/68/EEC,
89/336/EEC and subsequent amendment 92/31/EEC and 93/68/EEC

Additional information:

This product underwent a test in a typical uniform configuration (all products manufactured by FAAC S.p.A.).


Bologna, 10-10-2007


Managing Director

A. B. Rossi

Notes on reading the instruction

Read this installation manual to the full before you begin installing the product.

The symbol  indicates notes that are important for the safety of persons and for the good condition of the automated system.

The symbol  draws your attention to the notes on the characteristics and operation of the product.

1. DESCRIPTION

Thanks to its high powered microprocessor, this 24 Vdc control unit for automatic barriers offers a wide range of adjustments, including deceleration and motor control.

Thanks to its integrated encoder, the control unit constantly controls rod position and movement, intervening as soon as a faulty situation is detected.

The **FAILSAFE** function makes it possible to detect any faults in the operation of the photocells.

The main operating modes and functions are set by a dip-switch, whereas the adjustment of work and pause times is done by self learning during programming.

2. TECHNICAL SPECIFICATIONS

Power supply voltage	230 (+6% -10%) 50 Hz / 115 Vac 60 Hz
Supply voltage of control unit	24 Vac nominal ①
Absorbed power	3 W
Motor nominal power	48 W
Accessories max. load	500 mA
Flashing lamp max. load	15 W
Max. load for beam lights	15 W
Max. load for courtesy light/indicator light	5 W
Operating ambient temperature	-20° +55°
Protective fuse	F1=8 A F2=500 mA F3=630 mA (resettable)
Function logics	Automatic - Condo - Semi-automatic
Opening / closing time	Through self-learning during programming
Pause time	Through self-learning during programming
Obstacle detection	Trimmer-adjustable
Selectable functions	Type of logic - Operation of open command - No mains power supplied function - Beam lights flashing - Safety devices behaviour
Terminal board inputs	Power supply - Earth - Close - Open - Open/Close - Stop - Safety devices - Failsafe
Inputs with connector	Battery kit - Radio connector
Terminal board outputs	Power supply for accessories - On beam lights - Indicator light - Flashlight
Board dimensions	79 x 158 mm
Characteristics of optional batteries	See kit on price list



① According to mains voltage, there may be different output values on the board power feed terminals. Before putting into service, always check if the output voltage on the secondary winding of the transformer is from 20 Vac to 26 Vac. Voltage must always be measured load free.

3. PREPARATIONS



To ensure people's safety, all warnings and instructions in this booklet must be carefully observed. Incorrect installation or incorrect use of the product could cause serious harm to people.

- Make sure that an adequate differential switch is installed upstream of the system as specified by current regulations.
- On the main power supply, install a thermal breaker with omnipolar switching.
- Make sure that an adequate earthing system is available.
- To lay cables, use adequate rigid and/or flexible tubes.
- Always separate the connecting cables of low voltage accessories from those supplying 230/115 Vac, using separate sheaths to avoid possible interference.

4. BOARD LAY-OUT

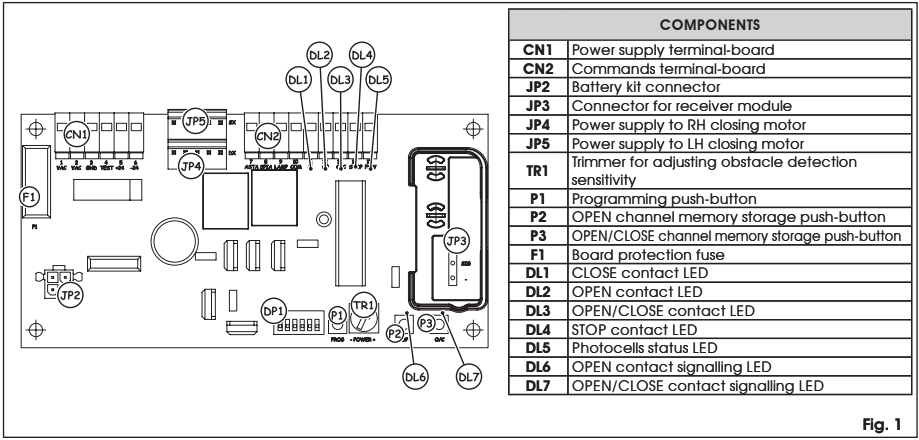


Fig. 1

ENGLISH

5. CONNECTION LAY-OUT

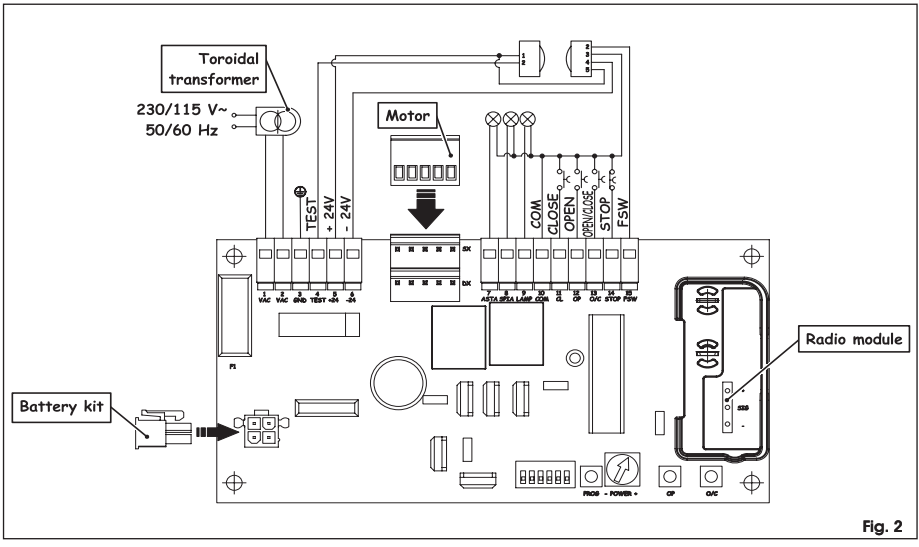


Fig. 2

6. DESCRIPTION OF CONNECTIONS

6.1. TERMINAL BOARD CN1

6.1.1. POWER SUPPLY

Terminals "1 & 2". The secondary winding wires of the toroidal transformer must be connected to these terminals.



Before making this connection, check if the voltage at the transformer output is in the range from 20 Vac to 26 Vac

6.1.2. EARTHING

Terminal "3". To this terminal, connect the earthing wire coming from the terminal inside the motor body.



The connection is absolutely necessary for correct operation of the control unit.

6.1.3. FALSAFE

Terminal "4". Connect to this terminal, the negative terminal of the photocell transmitters. By making this connection, the control unit, before every manoeuvre, runs a test on the photocells, controlling correct operation. If you use photocells, this terminal **must be** connected to ensure the control unit operates correctly.

6.1.4. POWER SUPPLY FOR ACCESSORIES

Terminals "5 & 6". 24 Vdc output max. 500 mA for feeding the external accessories.



- **Maximum load of this output is 500 mA.**
- **Observe the power supply polarity.**

6.2. TERMINAL BOARD CN2

6.2.1. BEAM LIGHTS

Terminals "7 & 10". Output 24 Vdc max. 15 W. The wires feeding the luminous strip should be connected to these terminals. The operation of the luminous strip is defined by using dip-switch 5 - see paragraph 7.



- **Terminal "10" is the negative polarity output.**

6.2.2. INDICATOR LIGHT

Terminals "8 & 10". Output 24 Vdc max. 5 W. An indicator light, if any, should be connected to these terminals. The indicator light makes it possible to see the beam status from a remote position, e.g. a porter's lodge - details:

- Beam opening is identified by fast flashing.
- When the beam is open, the indicator light stays lighted on a steady light-beam.
- Beam closing is identified by slow flashing.
- When the beam is closed, the indicator light stays OFF.



- **24 Vdc max. 5 W lamps can be connected to this output.**
- **Terminal "10" is the negative polarity output.**

6.2.3. FLASHING LIGHT

Terminals "9 & 10". Output 24 Vdc max. 15 W. A steady beam flashing light is connected to these terminals - flashing is controlled by the control unit. The flashing light is active while the beam is moving, whereas when the beam is idle, whether open or closed, it stays OFF. Pre-flashing of 0.5 sec was inserted before the beam opening manoeuvre, to signal that the beam is about to move. In addition to signalling beam movement, the flashing light signals - by a series of flashes - that the beam is being powered by the buffer battery (optional).



- **Terminal "10" is the negative polarity output.**

6.2.4. CLOSE

Terminals "10 & 11". Normally open contact. Connect, between these 2 terminals, any pulse generator (e.g. push-button, key selector, etc..) which, by closing the contact, commands beam closure only. The status of this input is signalled by LED "DL1".



- The **CLOSE** command is not active during programming.
- If there are several pulse generators, they must be connected in parallel.

6.2.5. OPEN

Terminals "10 & 12". Normally open contact. Connect, between these 2 terminals, any pulse generator (e.g. push-button, key selector, etc..) which, by closing the contact, commands beam opening only. The status of this input is signalled by LED "DL2".



- The **OPEN** command is not active during programming.
- If there are several pulse generators, they must be connected in parallel.

6.2.6. OPEN / CLOSE

Terminals "10 & 13". Normally open contact. Connect, between these 2 terminals, any pulse generator (e.g. push-button, key selector, etc..) which, by closing the contact, commands beam opening and/or closing. The behaviour of this input is defined by dip-switch 2, see paragraph 7. The status of this input is signalled by LED "DL3".



- If there are several pulse generators, they must be connected in parallel.

6.2.7. STOP

Terminals "10 & 14". Normally closed contact. Connect, between these 2 terminals, any pulse generator (e.g. push-button, key selector, etc..) which, by opening the contact, must command immediate stop of the beam and the de-activation of any automatic re-closure. To resume the normal programmed cycle after this contact has been activated, use any pulse generator which commands the opening and/or closing of the beam. The status of this input is signalled by LED "DL4".



- If there are several pulse generators, they must be connected in series.

6.2.8. SAFETY DEVICES

Terminals "10 & 15". Normally closed contact. Connect, to these terminals, any safety device (e.g. photocells) which, by opening the contact, acts on beam motion. They can be active only during closure, or active in both closing and opening, according to the position of dip-switch 6, see paragraph 7.

Safety devices active at closure

If the safety devices are activated during closure, the control unit immediately reverses beam movement until opening is complete without disabling - if selected - automatic re-closing of the beam.

Safety devices active at closure and opening:

In this case the safety devices are active on both beam movements. If the safety devices are activated during closure, the control unit immediately reverses beam movement until opening is complete without disabling - if selected - automatic re-closing of the beam. If the safety devices are activated during opening, the control unit immediately stops beam movement and keeps it stopped until the safety device is reset (obstacle removed), and only then will the opening manoeuvre which had been started be resumed. The status of this input is signalled by the LED located under the contact.



- If the safety devices are not used, a connection must be made between terminal 4 and terminal 15.
- If there are several safety devices, they must be connected in series.

6.3 MOTOR CONNECTION

The automated system is supplied designed for **right hand** closure, with the motor system connected to connector **JP4**. For **left hand** closure, the motor must be connected to connector **JP5**.

To identify beam closing direction, look at the automated system from the side of the release device. If the beam has to descend on the left of the automated system in order to close, left hand closure is involved, vice-versa, if the beam has to descend on the right of the automated system in order to close, right hand closure is involved.



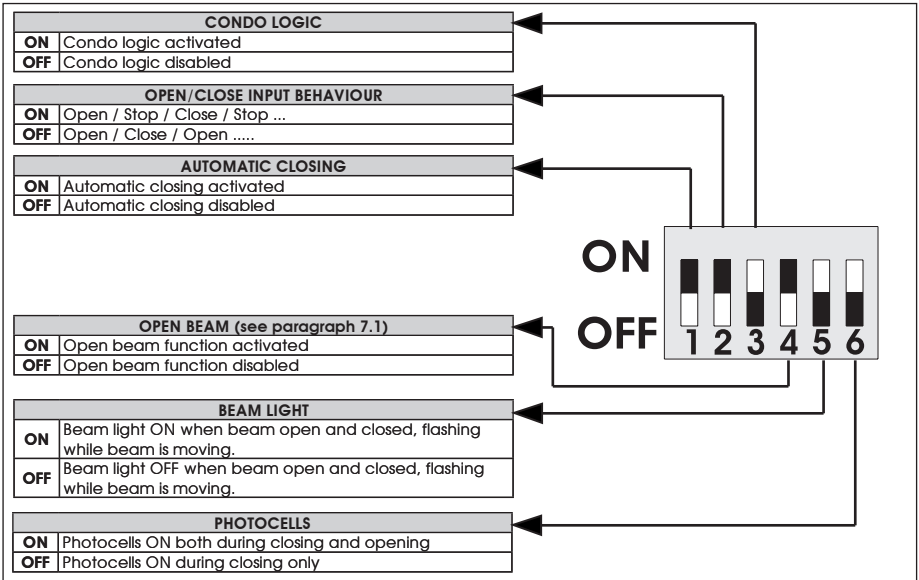
Two motors cannot be connected to the same control unit.

6.4. BATTERY KIT

A battery kit can be connected to the board - see price list - to make up for a possible power cut. For correct positioning of the battery kit inside the motor body, refer to the instruction for the mechanical part. The battery kit must be connected to connector **JP2**.

7. DIP-SWITCH ADJUSTMENT

6 dip-switches are located on the control unit. They command the behaviour of the automated system and of the safety devices connected to it. The behaviour of every dip-switch is summarised on the following table:



7.1. OPEN BEAM FUNCTION

With this function, combined or not with the battery kit, the following beam behaviour patterns are possible:

WITHOUT BATTERY KIT

Dip-switch 4=OFF: If there is a mains power cut, the beam stays stopped in the position it is in. When mains power returns, after 2 seconds the control unit automatically commands the beam to close, preparing itself for normal operation.

Dip-switch 4=ON: If there is a mains power cut, the beam stays stopped in the position it is in. When mains power returns, a pulse must be sent to ensure that the control unit resumes normal operation.

WITH BATTERY KIT

Dip-switch 4=OFF: If there is a mains power cut, the beam continues operating normally. At every opening, the flashing light flashes twice consecutively, at intervals of 3 seconds between the flashes, for a maximum time of 30 seconds, signalling that the beam is battery powered. When mains power is resumed, the automated system resumes normal operation.



The number of cycles possible with the automated system battery powered, depends on the battery charge level, on the time elapsing since mains power was stopped, and on the conditions of the automated system, external temperature etc...

Dip-switch 4=ON: In the event of a mains power cut, the automated system automatically opens the beam, stopping it in vertical position and disabling all the commands. When mains power returns, if automatic logic was selected, the automated system automatically performs a closing movement preparing itself for normal operation. Vice-versa, if manual logic was selected, the automated system waits for a pulse to resume normal operation.

8. MEMORY STORING THE RADIO CODE

The control board has an integrated 2-channel decoding system (**DS, SLH, LC**) named **OMNIDEC**. This system makes it possible to memory-store both **OPEN** command and the **OPEN/CLOSE** command of the automated system - this is made possible by an additional receiver module and radio controls on the same frequency.



- **The 3 types of radio codes (DS, LSH, LC) cannot coexist. Only one radio code can be used at a time. To change over from one code to another, you must delete the existing one (see paragraph 8.3), and repeat the memory-storage procedure.**
- **Fitting and, if necessary, removing the receiver module must be done only after cutting power to the board.**
- **The receiver module can only be inserted in one position. Orient the module correctly without forcing.**

8.1. Memory storage of DS radio controls



A maximum of **two codes** can be stored. One on the **OPEN** channel and one on the **OPEN/CLOSE** channel.

1. On the **DS** radio control, select the required ON-OFF combination for the 12 dip-switches.
2. On the control unit, press the push-button of the channel you wish to memory store, **P2** for the **OPEN** channel or **P3** for the **OPEN/CLOSE** channel.
3. The relevant LED on the control unit begins to flash - release the push-button.
4. On the radio control, press the push-button with which you wish to associate the selected channel.
5. The LED on the control unit lights up on steady beam for about one second, signalling that the radio control was stored in the memory, then it resumes flashing.
6. To add other radio controls or memory store the second channel, repeat the operations from point 1

8.2. Memory storage of SLH radio controls



You can memory store up to a maximum of **250 codes**, subdivided between the two channels, **OPEN** and **OPEN/CLOSE**.

1. On the radio control, simultaneously press and hold down push-buttons **P1** and **P2** (see radio control instructions).
2. After about one second, the LED of the radio control begins to flash.
3. Release both push-buttons.
4. Press and hold down push-button **P2** or **P3** on the board to respectfully memory store the **OPEN** or **OPEN/CLOSE** channel. The relevant LED begins to flash.
5. Simultaneously press the push-button of the radio control with which you wish to associate the selected command.
6. Check if the LED relating to the command being memory stored (**DL6** for the **OPEN** channel or **DL7** for the **OPEN/CLOSE** channel) lights up on steady beam for about two seconds to confirm correct memory storage.
7. To finish programming, press twice in close succession, the push-button of the memory stored radio control.



The automated system will perform an opening manoeuvre - make sure that there are no obstacles inside the operating range.

8. To memory store the other channel, repeat all the procedure from point 1.
To add other radio controls, transfer the code of the memory-stored push-button of the radio control to the relevant push-button of the radio controls to be added, repeating the memory storage procedure or observing the following procedure:

- On the memory stored radio control, simultaneously press and hold down push-buttons **P1** and **P2** (see radio control instructions).
- The radio control LED begins to flash.
- Release both push-buttons.

- Put the two radio controls frontally **into contact**.
- On the memory stored radio control, press and hold down the push-button relating to the channel you wish to transfer - the radio control LED lights up on steady beam.
- On the radio control to be memory stored, press the required push-button and release it after the radio control has flashed twice.
- To finish programming, press twice in close succession, the push-button of the memory stored radio control.



The automated system will perform an opening manoeuvre - make sure that there are no obstacles inside the operating range.

8.3. Memory storage of LC radio controls



You can memory store up to a maximum of **250 codes**, subdivided between the two channels, **OPEN** and **OPEN/CLOSE**.

1. Use **LC** remote controls only with receiver module at **433 MHz**.
2. On the control unit, press the push-button of the channel you wish to memory store, **P2** for the **OPEN** channel or **P3** for the **OPEN/CLOSE** channel.
3. The relevant LED on the control unit begins to flash - release the push-button.
4. On the radio control, press the push-button with which you wish to associate the selected channel.
5. The LED on the control unit lights up on steady beam for about one second, signalling that the radio control was stored in the memory, then it resumes flashing.
6. During this stage further radio controls can be stored in the memory.
7. After about 10 seconds, the control unit automatically exits the learning stage.
8. To add other radio controls or memory store the second channel, repeat the operations from point 1

8.3.1. REMOTE MEMORY STORAGE OF LC RADIO CONTROLS

Other radio controls can be remotely stored only with the **LC** radio controls, i.e. without using the push-buttons of the control unit, but using a previously stored radio control.

1. Get a radio control already memory stored on one of the 2 channels.
2. Step near to the automated system.
3. Press and hold down push-buttons **P1** and **P2** (see radio control instructions) simultaneously for about 5 seconds.
4. Within 5 seconds, press, on the memory stored radio control, the push-button you wish to transfer to the new radio control. In this way the learning stage on the selected channel is activated on the control unit.
5. Within 5 seconds, press, on the new radio control, the push-button you wish to associate with the selected channel.
6. After the new radio control has been stored in the memory, the control unit keeps the learning mode active on the selected channel for about 5 seconds.
7. During these 5 seconds, other radio controls can be memory stored on the control unit, as ever associated with the activated channel.
8. When 5 seconds have elapsed from memory-storage of the last radio control, the control unit automatically exits the learning stage.
9. To check if the radio control was correctly memory stored, wait for 5 seconds after sending the code.

8.4. Deletion of radio codes

To delete **all** the radio controls stored in the memory, go through the following procedure:

1. Press and hold down one of the two push-buttons **P2** or **P3**.
2. The relevant LED begins to flash.
3. After five seconds, the LED starts to flash at high speed.
4. After another five seconds both LEDs, **DL6** and **DL7** light up on steady beam.
5. Release the push-button.



This operation is irreversible, and all radio controls associated with both the OPEN and the OPEN/CLOSE command will be deleted.

9. OBSTACLE DETECTION SENSITIVITY

The obstacle detection device enables the control unit to detect any obstacles while the beam is moving. As this is an electronic device, it stays constant through time and is not subject to variations - this guarantees an automated system with a constant safety level.

By using the **TR1** trimmer, you can increase or reduce the obstacle detection sensitivity. Turn the trimmer **clockwise** to **increase** detection sensitivity, vice-versa turn it **anti-clockwise** to **reduce** obstacle detection sensitivity.

This device is active both during the beam closing stage and during the beam opening stage.

If it operates during the opening stage, it stops the operation of the automated system and reverses motion for 1 second. At this point, a pulse must be sent to the control unit, to resume normal programmed operation.

If it operates during the closing stage, it reverses operation until the automated system is completely open without disabling any automatic closing.

If it operates three times in succession, it blocks the operation of the automated system and locates itself in stop position, disabling automatic closing, if it was activated. To restore normal operation, you must command the beam to open or close. Behaviour patterns will differ, according to the command sent:

OPEN or **OPEN/CLOSE** pulse: In this case, the beam starts an opening manoeuvre at slower speed until the beam is completely open. When complete opening has been reached, the beam resumes its normal operating cycle, re-activating automatic re-closing, if it had been enabled.

CLOSE pulse: In this case, the beam starts a closing manoeuvre at slower speed until the beam is completely closed. When closed, the beam resumes its normal operating cycle, re-activating automatic re-closing, if it had been enabled.

10. PROGRAMMING



When the control unit is first powered up, a programming cycle must be performed. The board keeps all commands disabled, with the exception of programming push-button P1, and of the pulse generators connected to the OPEN/CLOSE input

When you have made the connections of all the accessories and generators, program the operating cycle. To program the control unit, follow the instructions below:

1. Turn the differential switch of the control unit, to make sure that the automated system is not powered.
2. Release the automated system, using the release device - see instructions for the mechanical part - and position the beam at about half of its opening angle (45°).
3. Re-lock the beam and make sure that it cannot be moved manually.
4. Power up the system.
5. Press **P1** for about 1 second, the flashing lamp goes on at steady beam.
6. Supply an **OPEN/CLOSE** command by means of any device connected to this input: the beam starts moving.



The first manoeuvre the beam carries out is in closing. If the automated system starts an opening manoeuvre, check if the motor connector is correctly connected, as described in paragraph 6.3.

7. Restore power and repeat the procedure from point 5.
8. When the closing mechanical stop is reached, the beam begins the opening manoeuvre.
9. When maximum opening is achieved, the pause time count for automatic re-closure begins.
10. When the required time has elapsed, supply another **OPEN/CLOSE** pulse, and the automated system will begin the closing stage.
11. When the closing position is reached, the flashing lamp goes off and programming has finished.



During the programming procedure, the beam moves more slowly and the safety devices are disabled.

11. CONTROL LEDs

There are 7 control LEDs on the control unit. The meanings of the LEDs are shown on the table below:

INPUT LEDS		
LED	ON	OFF
DL1 - CLOSE Input	Active command	Inactive command
DL2 - OPEN input	Active command	Inactive command
DL3 - OPEN/CLOSE input	Active command	Inactive command
DL4 - STOP input	Inactive command	Active command
DL5 - FSW input	Safety devices free	Safety devices engaged
PROGRAMMING LEDS		
LED	ON	OFF
DL6 - OPEN channel	Active input	Inactive input
DL7 - OPEN/CLOSE channel	Active input	Inactive input



The bold print indicates the condition of the LEDs with the control unit powered up and the beam closed in rest position.

12. FUNCTION LOGICS

LOGIC A (Automatic) DIP-SWITCH 1=ON / DIP-SWITCH 3=OFF							
BARRIER STATUS	INPUTS			STOP	PHOTOCELLS		
	OPEN	CLOSE	OPEN / CLOSE		DIP-SWITCH 2=OFF	DIP-SWITCH 6=OFF	DIP-SWITCH 6=ON
CLOSED	Opens and re-closes after pause time	No effect	Opens and re-closes after pause time	Opens and re-closes after pause time	No effect (if active, it disables all commands)	No effect	Disables OPEN commands
OPEN IN PAUSE	Reloads pause time	Closes immediately	Stops operation	Re-closes immediately	Stops operation	Disables commands at release resets pause time	Disables commands at release resets pause time
AT OPENING	No effect	Closes	Stops operation and, at next pulse, closes	Reverses motion on closing	Stops operation	No effect	Stops movement and restarts after release
AT CLOSING	Reverses on opening	No effect	Stops operation and, at next pulse, opens	Reverses motion on opening	Stops operation	Reverses motion on opening	Stops movement and opens at release

LOGIC E (Semi-automatic) DIP-SWITCH 1=OFF / DIP-SWITCH 3=OFF							
BARRIER STATUS	INPUTS			STOP	PHOTOCELLS		
	OPEN	CLOSE	OPEN / CLOSE		DIP-SWITCH 2=OFF	DIP-SWITCH 6=OFF	DIP-SWITCH 6=ON
CLOSED	Opens	No effect	Opens	Opens	No effect (if active, it disables all commands)	No effect	Disables OPEN commands
OPEN	No effect	Closes immediately	Re-closes immediately	Re-closes immediately	Stops operation	Disables all commands	Disables commands
AT OPENING	No effect	Closes	Stops operation	Reverses motion on closing	Stops operation	No effect	Stops movement and restarts after release
AT CLOSING	Reverses on opening	No effect	Stops operation	Reverses motion on opening	Stops operation	Reverses motion on opening	Stops movement and opens at release

LOGIC CN (Condo) DIP-SWITCH 1=ON / DIP-SWITCH 3=ON

BARRIER STATUS	INPUTS						
	OPEN	CLOSE	OPEN / CLOSE		STOP	PHOTOCELLS	
			DIP-SWITCH 2=ON	DIP-SWITCH 2=OFF		DIP-SWITCH 6=OFF	DIP-SWITCH 6=ON
CLOSED	Opens and re-closes after pause time	No effect	Opens and re-closes after pause time	Opens and re-closes after pause time	No effect (if active, it disables all commands)	No effect	Disables OPEN commands
OPEN IN PAUSE	Reloads pause time	Closes immediately	Reloads pause time	Re-closes immediately	Stops operation	Disables commands and at release resets pause time	Disables commands and at release resets pause time
AT OPENING	No effect	Reverses motion on closing	No effect	No effect	Stops operation	No effect	Stops movement and restarts after release
AT CLOSING	Reverses on opening	No effect	Reverses motion on opening	Reverses motion on opening	Stops operation	Reverses motion on opening	Stops movement and opens at release