EC DECLARATION OF CONFORMITY

Manufacturer :   FAAC S.p.A.

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

Declares that: 724D control board,

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

Additional note:
  This product underwent tests in a typical uniform configuration
  (all products manufactured by FAAC S.p.A.).

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 and disconnect the batteries (if provided).

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

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

17) Use of at least one indicator-light (e.g. FAACLIGHT 12VDC) is recommended for every system, as well as a warning sign adequately secured to the frame structure, in addition to the devices mentioned at point "16".

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

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

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

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

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

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

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

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

26) Do not short-circuit the poles of the batteries and do not try to recharge the batteries with power supply units other than those provided with the equipment (if provided).

27) Do not throw exhausted batteries into containers for other waste but dispose of them in the appropriate containers to enable them to be recycled. Disposal costs have already been paid for by the manufacturer (if provided).

28) 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.

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

724D ELECTRONIC CONTROL UNIT FOR 24 Vdc SLIDING GATES WITH ENCODER AND LIMIT-SWITCH
USE INSTRUCTIONS - INSTALLATION INSTRUCTIONS

1. GENERAL CHARACTERISTICS

This control unit for 24 Vdc sliding gates with encoder offers high performance and a wide range of adjustments: opening and closing decelerations, motor control and a facility for managing the opening and closing limit-switches.

A sophisticated electronic control constantly monitors the power circuit and disables the control unit in the event of malfunctions that could impair efficiency of the electronic clutch.

The parameter settings and the operating logic are shown on a handy display, which, indicates gate status during normal operation. The 24V operators 740 are designed to directly house 2 12Vdc-1,2Ah buffer batteries (optional). Alternatively, 2 larger external 12Vdc-4Ah batteries (optional) can be used with support for fastening in suitable enclosure.

2. TECHNICAL SPECIFICATIONS

Supply voltage of transformer	115 / 230 V~ (+6 -10%) - 50 / 60 Hz.
Supply voltage of control unit	24 V~ (+6 -10%) - 50 / 60 Hz.
Absorbed power	3 W
Motor max load	70 W
Accessories max load	24Vdc 500mA
Flashing lamp max. load	24Vdc 15W max.
Operating ambient temperature	-20°C +50°C
Protection fuses	3
Function logics	Automatic / Stepped Automatic / Semiautomatic / Stepped Semiautomatic / Condo type
Opening / closing time	Through self-learning during programming
Pause time	Through self-learning during programming
Thrust force	Four levels adjustable on display
Decelerations	Through self-learning during opening and closing
Terminal board inputs	Power supply 22V~ / Battery supply / Encoder / Total opening / Pedestrian opening / Opening-closing safety devices / Stop / Opening-closing limit-switch
Radio connector	Rapid 5-pin connector
Terminal board outputs	24Vdc power supply to accessories / 24Vdc Motor / Flashing lamp 24Vdc
Board dimensions	127 x 145 mm.
Characteristics of 230V~ toroidal transformer	prim. 230V~ - sec. 22V~ / 80VA
Characteristics of 115V~ toroidal transformer	prim. 115V~ - sec. 22V~ / 80VA
Characteristics of optional indoor batteries	12V - 1.2 Ah / dimens. 96 x 46 x 50 mm.
Characteristics of optional outdoor batteries	12V - 4 Ah / dimens. 90 x 70 x 108 mm.
Characteristics of outdoor enclosure	305 x 225 x 125 mm. - IP55

Attention: different output values on voltage 24V~ are possible according to the mains voltage. Before starting, always check the transformer output voltage. It shall not exceed 26V~ both for the 230V~ power supply and 115V~ power supply. Voltage is to be measured loadless, i.e. when the transformer is supplied with power but disconnected from the board.

3. PRELIMINARY SETTING-UP

Attention: 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 there is an adequate differential switch upstream of the system as specified by current laws, and install a thermal breaker with all-pole switching on the electrical supply line.

To lay electric cables, use adequate rigid and/or flexible pipes. Always separate the connection cables of low voltage accessories from the 115/230 V~ power cables.

In the version with control unit installed on the gearmotor, some connections and installations described in these instructions (motor, transformer, encoder, etc) are factory wired.

In the version with control unit in the watertight outdoor enclosure, maximum length of connection cables between control unit and motor/encoder must not exceed 3 m., using 2x2.5mm² cables for the motor and 3x0.5mm² cables for the encoder and for the limit-switches (optional).

Procedure for securing components in the waterproof enclosure, referring to fig. 1:

1) Secure the support for the toroidal transformer in position **A**, using 3 Ø4.2x13 self-tapping screws (supplied), placing the spacers between the support and the guides of the watertight enclosure.

NB.: the support is sized to house a transformer with the characteristics and dimensions specified on the table in paragraph 2.

2) Secure the transformer to the support with 2 clamps (supplied).

3) If using buffer batteries, secure the relevant support in position **B** with 4 Ø3.5x9.5 self-tapping screws (supplied) in the crossover holes of the guides of the watertight enclosure.

NB.: the support is sized to house 2 batteries (not supplied) with the characteristics and dimensions specified on the table in paragraph 2.
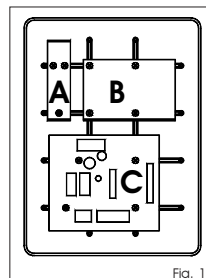

Fig. 1

4) Position the batteries on the support.

5) Secure the control unit in position **C** with 4 Ø4.2x13 self-tapping screws (supplied), placing the spacers between the board and the guides of the watertight enclosure.

4. CONNECTIONS AND OPERATION

4.1. TERMINAL BOARD M1

4.1.1 Open A
Terminals "OPEN A - COM 2". Normally open contact. Connect, to these terminals, any device (push-button, key selector, etc.) that commands total opening of the gate. The operation of this contact is defined by parameter **D.**
NB.:
• An OPEN A pulse, total opening, always has priority on OPEN B, partial opening.
• To install several pulse generators, connect the contacts in parallel.

4.1.2 Open B
Terminals "OPEN B - COM 2". Normally open contact. Connect, to these terminals, any device (push-button, key selector, etc.) that must command partial opening of the leaf. Partial opening is non-adjustable and equals 30% of the memory-stored total opening.
NB.:
• An OPEN A pulse, total opening, always has priority on OPEN B, partial opening.
• To install several pulse generators, connect the contacts in parallel.

4.1.3 STOP command
Terminals "STOP - COM 2". Normally closed contact. Connect, to these terminals, any safety device (push-button, key selector, etc.) that must stop gate movement. The status of this input is signalled by LED DL2 "STOP".
NB.:
• If no STOP devices are connected, jumper connect the input.
• To install several STOP devices, connect the normally closed contacts in series.

4.1.4 Closing safety devices
Terminals "FSW CL - COM 2". Normally closed contact. Connect, to these terminals, any safety device (photocells, safety edge, etc.) that must control gate closing motion by reversing gate movement up to the maximum memory-stored opening. The status of this input is signalled by LED DL3 "FSW-CL".
NB.:
• If no closing safety devices are connected to the closing motion, jumper connect the input.
• To install several safety devices on the closing motion, connect the normally closed contacts in series.

4.1.5 Opening safety devices
Terminals "FSW OP - COM 2". Normally closed contact. Connect, to these terminals, any safety device (photocells, safety edge, etc.) that must control gate opening motion by stopping its movement. When the safety device is released, motion will resume normally, executing the memory-stored cycle. The status of this input is signalled by LED DL4 "FSW-OP".
NB.:
• If no safety devices are connected to the opening motion, jumper connect the input:
• To install several safety devices on the opening motion, connect the normally closed contacts in series.

4.2 M2 TERMINAL BOARD

4.2.1 Encoder
Terminals "SIG. - -ENC - +ENC". Use the encoder supplied with the control unit. On the "SIG" terminal: connect the return signal from encoder terminal "S11"; connect encoder terminal "-12" to the "-ENC" terminal; connect encoder terminal "+13" to terminal "+ENC".
NB.:
• The encoder must be used for operation of the control unit
• For encoder operation, observe the connection between terminals as described above.

4.2.2 Closing limit switch (optional)
Terminals "COMF - FCC". Normally closed contact. Connect the closing limit-switch, if any, to these terminals. The switch operates by stopping the gate closing motion. The status of this input is signalled by LED DL5 "FCC".
NB.:
• If no closing limit-switch is used, the input must be jumper connected.

4.2.3 Opening limit switch (optional)
Terminals "COMF - FCA". Normally closed contact. Connect the opening limit-switch, if any, to these terminals. The switch operates by stopping the gate opening motion. The status of this input is signalled by LED DL6 "FCA".
NB.:
• If no opening limit-switch is used, the input must be jumper connected.

4.3 M3 TERMINAL BOARD

4.3.1 Flashing Lamp
Terminals "LAMP - LAMP". Use a flashing-lamp with steady light (flashing is produced by the control unit) on operating voltage of 24 Vdc 15W max. It is recommended to connect the flashing lamp before programming the control unit, because its phases are displayed. A 1.5 sec. pre-flashing steady light goes on during both opening and closing. When the gate is open, the flashing-lamp is OFF, and only flashes when the closing safety devices are engaged for a maximum time of 10 sec, signalling that one is operating in the gate movement area, after which the flashing-lamp goes OFF even with the closing safety devices still engaged.

4.3.2 Motor
Terminals "CHM1 - APM1". Connect, to these terminals, the motor with a power supply of 24Vdc 70W max.

4.4 TERMINAL BOARD M4

4.4.1 Power supply
Terminals "VAC - VAC". Connect, to these terminals, the secondary winding wires arriving from the toroidal transformer with voltage of 22V~ 50 Hz. Power ON is indicated by the lighting up of LED DL1 "POWER".

4.4.2 Batteries (optional)
Terminals "+BAT - - BAT". Connect the 2 buffer batteries (optional) to these terminals. When the control unit is powered, it will keep the batteries charged. The batteries come into operation when the transformer does not supply power.

NB.:
• For battery dimensions and characteristics, refer to the descriptions on the table in paragraph 2.
• Power supply provided by the batteries should be considered an emergency situation. The number of possible manoeuvres depends on the quality of the batteries, the gate's structure (weight, length, general conditions, etc.), and on the time since power was cut, etc, etc.
• Observe the battery supply polarity.

4.4.3 Accessories
Terminals "+24 - -24". Output for power supply to 24Vdc outside accessories.
NB.:
• Maximum load of accessories is 500 mA.

4.4.4 Earthing
An appropriate earthing terminal or cable. Earth connect the mains supplying 230V~.
NB.:
• The connection is essential for correct operation of the control unit.

5. INSTALLING A RECEIVER CARD FOR REMOTE-CONTROL

The control unit is designed to house a 5-pin radio-receiver module. To install, cut out power and fit the module in the appropriate **M5** connector inside the control unit.
   ATTENTION: To avoid damaging the receiver and thus irreparably impairing its operation, the receiver must be installed while observing the fitting direction specified in paragraph 12 (Connection lay-out).
This done, observe the radio-receiver instructions for memory-storing the remote control. When the remote control has been stored, it controls START just like any command device.

6. CONTROL LEDS

LED	ON	OFF
DL1 - POWER	**Control unit supplied by transformer**	No power supplied, or control unit supplied by the buffer batteries
DL2 - STOP	**Command inactive**	Command enabled
DL3 - FSW-CL	**Safety device free**	Safety devices engaged
DL4 - FSW-OP	**Safety device free**	Safety devices engaged
DL5 - FCC	Closing limit switch free	**Closing limit switch engaged**
DL6 - FCA	**Opening limit switch free**	Opening limit switch engaged

NB.:
• Indicated in bold: status of LEDs with the gate closed, control unit supplied by transformer, and limit-switches connected.
• If the limit-switches are not used, the relevant contacts must be jumper connected and the DL5 and DL6 LEDs must always be ON.

7. OPERATION OF DISPLAY

The control unit has a handy display for viewing and programming the operating parameters. Furthermore, it constantly shows gate status during normal operation.
When parameters are being displayed and adjusted, the display shows the selected parameter on the left, and the relevant value on the right. Fig. 2 shows a display example of parameter "A" at value "2".
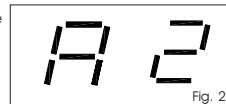
Fig. 2

During normal operation, the display shows gate status. The displayed values are indicated on the following table:

DISPLAY VALUE	GATE STATUS
– –	Gate at rest
OP	Gate opening
tc	Gate open in pause status (Only with automatic re-closure enabled - see next paragraph).
CL	Gate closing

During programming, the display shows value "*Pr*" for the whole time.

8. ADJUSTING THE OPERATING PARAMETERS

When you have made all the necessary connections, power up the system and check if all the signalling LEDs are in the condition specified in paragraph 6.
To access parameter adjustment, follow the instructions below:
• Display shows value – – .
• Press and hold down key **P2** until the display shows the name of the first parameter.
• Press push-button **P1** to change the value of the parameter.
• To move on to the next parameter, press push-button **P2** again..
• When 60 seconds have elapsed without any key being touched, the control unit exits the adjustment mode. You can manually exit the adjustment mode by scrolling all the parameters. When the displays show " – – " , you have returned to normal operation.
The following table summarises the different parameters and the assignable values.

DISPLAY	DESCRIPTION
Sensitivity adjustment of electronic clutch and motor force.	
A 1	Low motor force
A 2	Medium-low motor force
A 3	Medium-high motor force
A 4	High motor force
Automatic re-closure: this function enables or disables automatic gate closing.	
c 0	Disabled
c 1	Enabled
Operation of OPEN A command: this function determines the behaviour of the OPEN A (total opening) push-button.	
d 0	Opens / Closes / Opens
d 1	Opens / Stops/ Closes / Stops
Reversing stroke after closing: if this function is enabled, the gate will effect about half its opening stroke, after closing. This allows to relieve the release device, facilitating its possible operation.	
E 0	Disabled
E 1	Enabled
Condo function: if this function is enabled while the gate is being opened, the open command is inhibited.	
F 0	Disabled
F 1	Enabled
Deceleration point percentage: this parameter is used to set the length of the decelerated section, selecting it from the two set values.	
H 0	20% of maximum memory-stored opening
H 1	10% of maximum memory-stored opening
Speed during decelerated phase: this parameter is used to set motor speed during the decelerated phase, selecting it from the two values.	
i 0	Low
i 1	High
Operation with limit switches: this function must be enabled only if the limit-switches are also being used.	
L 0	With encoder only
L 1	Encoder and limit-switch

9. PROGRAMMING

During the programming procedure, the control unit memory-stores the mechanical stop points during opening, closing, and any pause time. To carry out the programming procedure, follow these instructions:

• Release the gearmotor, take the gate to halfway its opening stroke, and them re-lock the gearmotor.
• Power up the control unit and check if value " – – " is shown on the display.
• Hold down key **P2** for about 5 seconds - the control unit shows the value of the first parameter.
• Give an OPEN A pulse, using a push-button and any other device commanding total gate opening, the display shows value "*Pr*" , and the gate begins a closing manoeuvre up to the mechanical closing stop, or up to the closing limit-switch, if supplied and enabled (see previous paragraph).
  Attention: if, during programming, the operator's first manoeuvre is opening, cut power and change over the wires connected to terminals "CHM1 - APM1". Repeat the programming procedure from the first point.
• After a pause of about 2 seconds, the gate carries out a total opening either up to the opening mechanical stop point or to the relevant limit-switch.
• If automatic closing is not enabled, this means programming has finished and the display shows value " – – ". Vice versa, the control unit begins counting pause time.
• When the required time has elapsed, give another OPEN A command, and the gate will begin to close.
• When closing has finished, programming has terminated too, and the display shows value " – – ".

N.B.:
• The display shows value "*Pr*" during the entire programming procedure.
• The flashing lamp stays lighted on a steady light during the entire programming time.
• Gate motion is decelerated during programming.

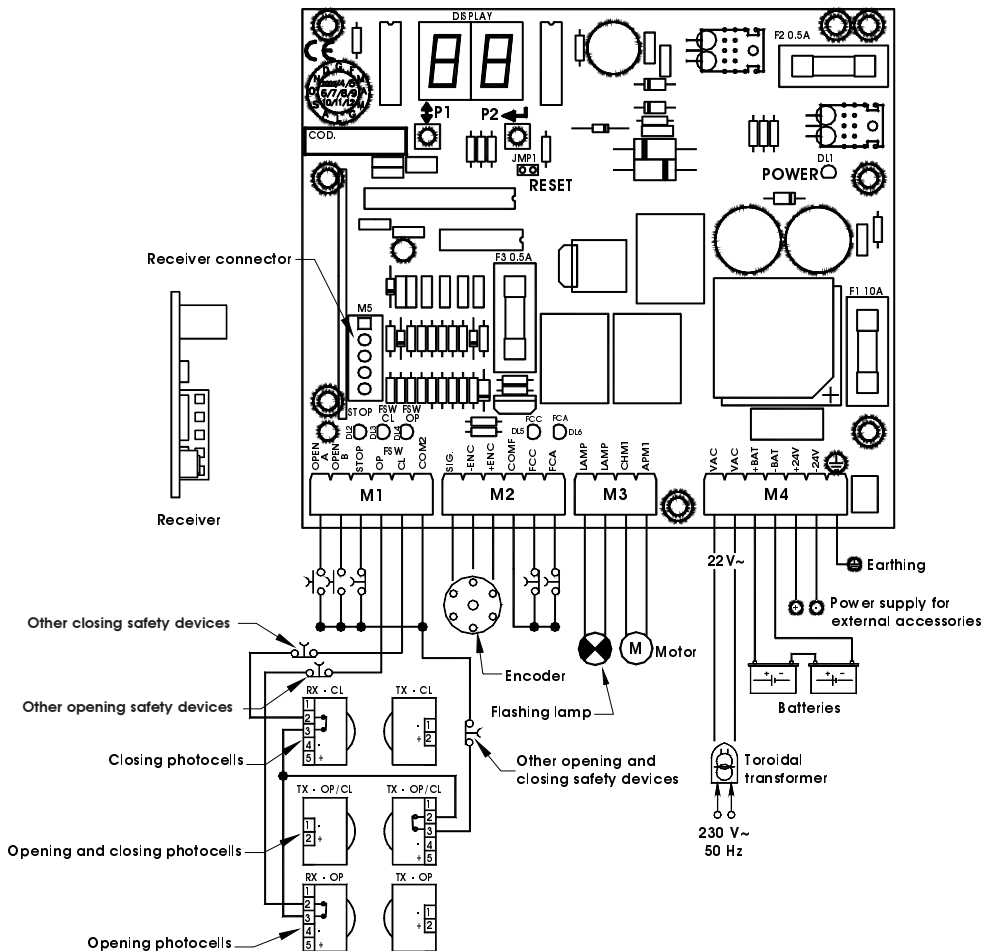## 10. OPERATION OF ELECTRONIC CLUTCH

A very important device for reasons of safety. Its setting stays unchanged long-term, without wear or any setting changes.
It is active during both closing and opening. When it operates, it reverses movement without disabling automatic closing if enabled.
If it operates twice consecutively, it goes into STOP status, disabling any automatic command. This is because, as the clutch operates twice, it means that the obstacle remains and it could be dangerous to perform any further manoeuvre, therefore forcing the user to give an opening or closing command.
If the clutch operates for more than 90 consecutive seconds, the control unit performs an EMERGENCY procedure and will carry out a complete opening in decelerated mode up to the opening stop-point, and then will close automatically so that stop-points are independently re-synchronised.

11. PROTECTION FUSES

FUSE	PROTECTION	FUSE	PROTECTION	FUSE	PROTECTION
F1=T10A/250V - 5x20	Power supply 22V	F2=T0.5A/250V - 5x20	Supply to accessories and battery-charger	F3=R0.5A/250V - 5x20	Flashing lamp output

12. CONNECTION LAY-OUT

13. FUNCTION LOGICS

Automatic "A" logic C=1 d=0 F=0

Gate status	Pulses			Opening safety devices	Closing safety devices	OP/CL safety device
	Open A	Open B	Stop			
Closed	Opens the leaf and re-closes after pause time	Executes leaf partial opening and re-closes after pause time	No effect (OPEN disabled)	Disables OPEN commands	No effect	Disables OPEN commands
Open on pause	Reloads pause time	Re-closes the gate immediately	Stops operation	No effect	Disables re-closing and, on release, re-closes after 5 seconds if pause time has elapsed. Vice-versa, it re-closes when set pause time has elapsed	Disables re-closing and, on release, re-closes after 5 seconds if pause time has elapsed. Vice-versa, it re-closes when set pause time has elapsed
Closing	Reverses gate motion	No effect	Stops operation	No effect	Reverses motion	Stops operation and reverses on release
Opening	Reverses gate motion	No effect	Stops operation	Stops operation and resumes on release	No effect	Stops operation and resumes on release

Stepped Automatic "AP" logic C=1 d=1 F=0

Gate status	Pulses			Opening safety devices	Closing safety devices	OP/CL safety device
	Open A	Open B	Stop			
Closed	Opens the leaf and re-closes after pause time	Executes leaf partial opening and re-closes after pause time	No effect (OPEN disabled)	Disables OPEN commands	No effect	Disables OPEN commands
Open on pause	Reloads pause time	Re-closes the gate immediately	Stops operation	No effect	Disables re-closing and, on release, re-closes after 5 seconds if pause time has elapsed. Vice-versa, it re-closes when set pause time has elapsed	Disables re-closing and, on release, re-closes after 5 seconds if pause time has elapsed. Vice-versa, it re-closes when set pause time has elapsed
Closing	Stops gate motion and opens on next pulse	No effect	Stops operation	No effect	Reverses motion	Stops operation and reverses on release
Opening	Stops gate motion and closes on next pulse	No effect	Stops operation	Stops operation and resumes on release	No effect	Stops operation and resumes on release

Semi-automatic "E" logic C=0 d=0 F=0

Gate status	Pulses			Opening safety devices	Closing safety devices	OP/CL safety device
	Open A	Open B	Stop			
Closed	Opens the leaf	Executes partial opening	No effect (OPEN disabled)	Disables OPEN commands	No effect	Disables OPEN commands
Open	Closes	Closes the gate	No effect (OPEN disabled)	Disables OPEN commands	Disables OPEN command	Disables OPEN command and, on release, re-closes after 5 sec..
Closing	Reverses gate motion	No effect	Stops operation	No effect	Reverses gate motion	Stops operation and reverses on release
Opening	Reverses gate motion	No effect	Stops operation	Stops operation and resumes on release	No effect	Stops operation and resumes on release

Stepped Semi-automatic "EP" logic C=0 d=1 F=0

Gate status	Pulses			Opening safety devices	Closing safety devices	OP/CL safety device
	Open A	Open B	Stop			
Closed	Opens the leaf	Executes partial opening	No effect (OPEN disabled)	Disables OPEN commands	No effect	Disables OPEN commands
Open	Closes	Closes the gate	No effect (OPEN disabled)	Disables OPEN commands	Disables OPEN command	Disables OPEN command and, on release, re-closes after 5 sec..
Closing	Stops gate operation and opens on next pulse	No effect	Stops operation	No effect	Reverses gate motion	Stops operation and reverses on release
Opening	Stops gate motion and closes on next pulse	No effect	Stops operation	Stops operation and resumes on release	No effect	Stops operation and resumes on release

Condo "D" logic C=1 d=0 F=1

Gate status	Pulses			Opening safety devices	Closing safety devices	OP/CL safety device
	Open A	Open B	Stop			
Closed	Opens the leaf and re-closes after pause time	Executes leaf partial opening and re-closes after pause time	No effect (OPEN disabled)	Disables OPEN commands	No effect	Disables OPEN commands
Open on pause	Reloads pause time	Re-closes the gate immediately	Stops operation	No effect	No effect	Disables re-closing and, on release, re-closes after 5 seconds if pause time has elapsed. Vice-versa, it re-closes when set pause time has elapsed
Closing	Reverses gate motion	No effect	Stops operation	No effect	Reverses motion	Stops operation and reverses on release
Opening	No effect	No effect	Stops operation	Stops operation and resumes on release	No effect	Stops operation and resumes on release