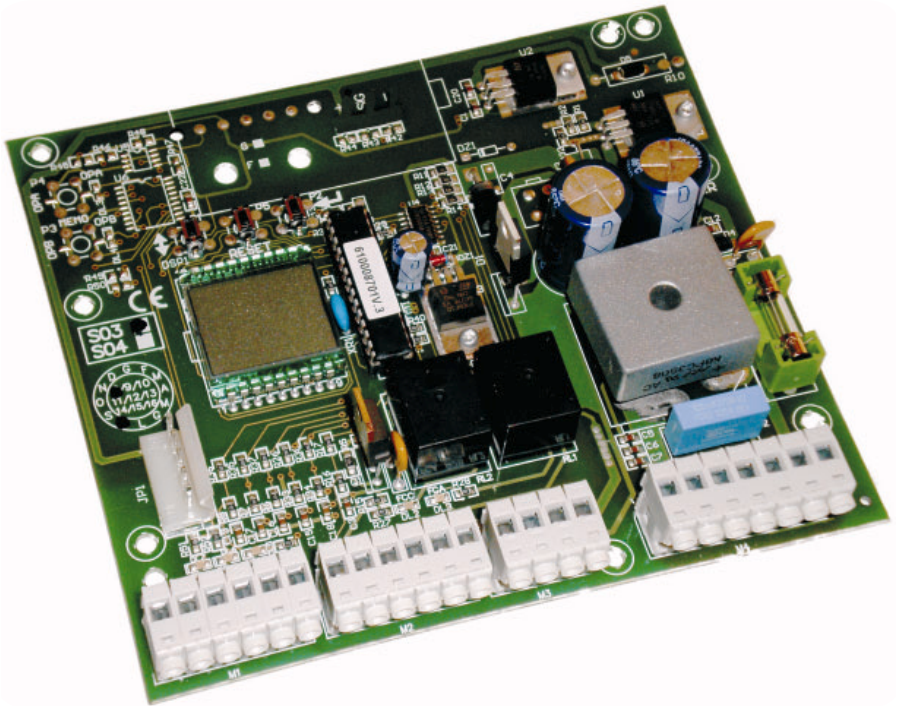


724D



FAAC

INDEX

1. GENERAL CHARACTERISTICS	<i>page 14</i>
2. TECHNICAL SPECIFICATIONS	<i>page 14</i>
3. PREPARATIONS	<i>page 14</i>
4. BOARD LAY-OUT	<i>page 15</i>
5. CONNECTIONS AND OPERATION	<i>page 15</i>
5.1. TERMINAL BOARD CN1	<i>page 15</i>
5.2. TERMINAL BOARD CN2	<i>page 16</i>
5.3. TERMINAL BOARD CN3	<i>page 16</i>
5.4. TERMINAL BOARD CN4	<i>page 17</i>
6. INSTALLING THE RADIO CONTROL RECEIVER BOARD	<i>page 18</i>
7. CONTROL LEDS	<i>page 19</i>
8. OPERATION OF DISPLAY	<i>page 19</i>
9. ADJUSTING THE OPERATING PARAMETERS	<i>page 19</i>
10. PROGRAMMING	<i>page 21</i>
11. OPERATION OF ELECTRONIC CLUTCH	<i>page 21</i>
12. PROTECTION FUSES	<i>page 21</i>
13. FUNCTION LOGICS	<i>page 22</i>
14. HOW TO SECURE THE BOARD	<i>page 24</i>

CE DECLARATION OF CONFORMITY

Manufacturer: FAAC S.p.A.

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

Declares that: Control unit mod. **724D**

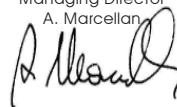
- conforms to the essential safety requirements of the following EEC directives:
 - 2006/95/EC Low Voltage directive.
 - 2004/108/EC Electromagnetic Compatibility directive.

Additional information:

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


Bologna, 01 September 2008


Managing Director
A. Marcellan



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.

24 Vdc CONTROL UNIT FOR SLIDING GATES

OPERATING INSTRUCTIONS – INSTALLATION INSTRUCTIONS

1. GENERAL CHARACTERISTICS

This 24Vdc control unit for sliding gates offers high performance and a wide range of adjustments, with opening and closing slow-downs, encoder management and the possibility of managing both opening and closing travel limit devices.

If correctly installed, thanks to encoder control, this control unit guarantees installation conforming to current safety regulations.

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

The parameter settings and the operating logics are shown on a handy LCD display, which indicates gate status during normal operation. Operating times are controlled by self-learning during programming.

In "C" version gearmotors, the control unit is on board the gearmotor. A waterproof enclosure is available for housing the control unit and any buffer batteries (optional) which must correspond to the indications in the following table.

2. TECHNICAL SPECIFICATIONS

Supply voltage of transformer	230/115 Vac (+6 -10%) - 50/60 Hz.
Supply voltage of control unit	24 Vac (+6 -10%) - 50/60 Hz.
Absorbed power	3 W
Motor max. load	70 W
Accessories max. load	24Vdc 500mA
Flashing lamp/courtesy light max. load	24Vdc 15W max.
Operating ambient temperature	-20°C +50°C
Protection fuses	4 (3 self resetting)
Function logics	Automatic / Step-by-step automatic/Semi-automatic / Step-by step semi-automatic/Condominium
Opening / closing time	Through self-learning during programming
Pause time	Through self-learning during programming
Thrust force	Four levels adjustable on display
Slow-downs	At opening and closing
Terminal board inputs	24 Vac power supply, Supply to batteries, Encoder, Total opening, Pedestrian opening, Opening safety devices, Closing safety devices, Stop, Opening travel limit devices, Closing travel limit devices
Radio connector	Rapid 5 pin connector for receiver
Terminal board outputs	24Vdc supply for accessories, 24Vdc for motors, Courtesy light/ Flashing lamp 24 Vdc, Electrical lock 12 Vdc/ac
Board dimensions	145 x 128 mm.
Characteristics of 230Vac toroidal transformer	primary 230Vac sec. 22Vac 120VA
Characteristics of 115Vac toroidal transformer	primary 115Vac sec. 20Vac 120 VA
Characteristics of optional batteries	12V 4Ah dimensions: 90 x 70 x 108 mm
Characteristics of outdoor grade enclosure	306 x 225 x 130 mm. - IP55



Different output values can be obtained on the 24Vac output depending on the mains voltage value. Before start-up, always check the transformer output voltage. It must not exceed 26Vac for both power feed values of 230Vac and 115Vac. Voltage must be measured load free, i.e. with the transformer powered and disconnected from the board.

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.

Keep the instructions for future reference

Make sure there is an adequate differential switch upstream of the system as specified by current laws, and install a single-pole thermal breaker on the electrical power mains.

To lay cables, use adequate rigid and/or flexible tubes.

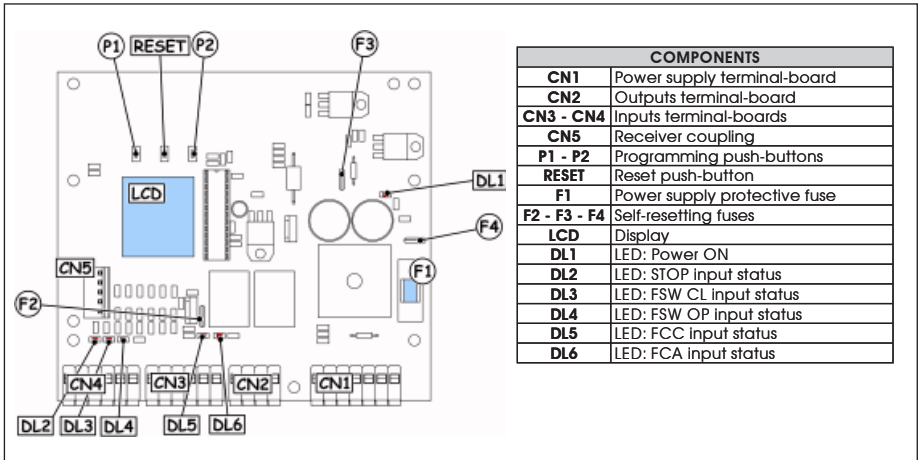
Always separate connection cables of low voltage accessories from those supplying 115/230 Vac. To prevent any interference whatever, use separate sheaths.



If you wish to put the control unit in a remote position with respect to the motor, the maximum length of the power cables between the control unit and the motor must not exceed 3 m, using cables with a diameter of 2.5 mm² for the motor and 3x0.5 mm² for the encoder and the travel limit devices (optionals). One cannot guarantee correct encoder operation for distances longer than 3 meters.

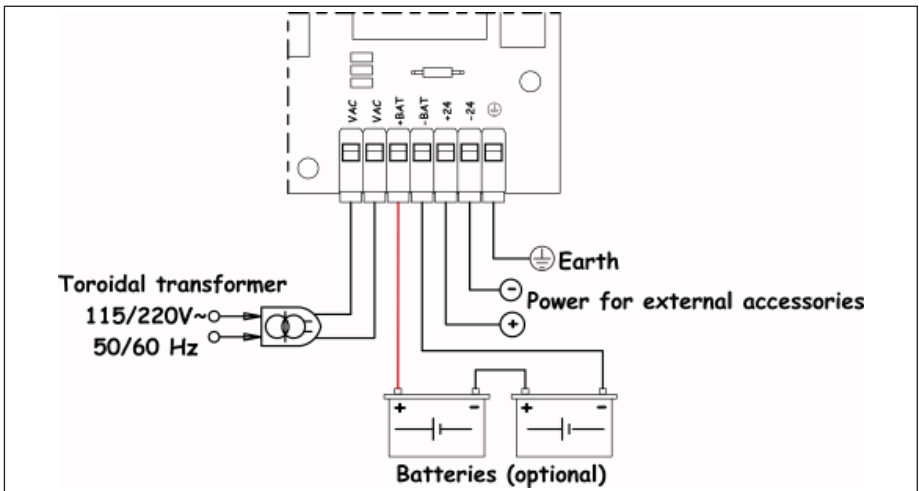
Procedure for securing components inside the water-tight enclosure, refer to paragraph 15.

4. BOARD LAY-OUT



5. CONNECTIONS AND OPERATION

5.1. TERMINAL BOARD CN1



5.1.1. POWER SUPPLY 22V

Terminals "VAC - VAC". Connect the transformer secondary circuit to this input with power supply of 24Vac 50/60 Hz. Presence of power supplied by the transformer is signalled by the lighting up of the "DL1" LED.

5.1.2. BATTERIES

Terminals "+BAT - BAT". Connect the buffer batteries (optional) power cables to these terminals. The control unit is designed to operate with two buffer batteries, with the minimum characteristics shown on the table of paragraph 2. During normal operation, the control unit keeps the batteries charged. They enter into operation if no power is supplied to the transformer.

Power supply from batteries only should be considered an emergency situation. The number of possible manoeuvres is linked to the quality of the batteries, the structure of the gate to be moved, how long ago the power cut occurred, etc, etc..

Observe the battery supply polarity.

5.1.3. ACCESSORIES


"**+24V - -24V**" terminals. The accessories power cables should be connected to these terminals.

 The maximum load of the accessories must not exceed 500 mA.

 **The output of these terminals is DC - observe the power supply polarity of the accessories.**

5.1.4. EARTH

" Terminal. The control unit earthing line should be connected to this terminal.

 This connection is absolutely necessary to ensure a correctly operating control unit.

5.2. TERMINAL BOARD CN2

5.2.1. GEARMOTOR


"**APM1 - CHM1**" terminals. Connect the motor power cables to these terminals. The maximum load applied to these terminals must not exceed 70W


5.2.2. FLASHING LAMP / COURTESY LIGHT

"**LAMP - LAMP**" terminals. Both a flashing lamp and a courtesy light can be connected to these terminals, both powered on 24 Vdc and a maximum of 15W. To make this output operational, select parameter "**G**", see paragraph 9.

Flashing lamp operation:

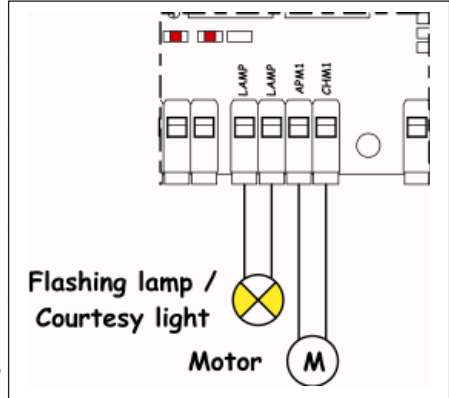
During normal operation, the flashing lamp operates only when the leaves are moving. When the leaves are idle, both during opening and closing, the flashing lamp stays off.

 We advise you to connect the flashing lamp before programming the control unit, because it indicates its phases.

 **Use a steady light flashing lamp; flashing is controlled by the control unit.**

Courtesy light operation:

The courtesy light stays on for the entire cycle time. At the end of the cycle, the light stays on for another 2 minutes. The activation time of the courtesy light cannot be changed. Use a lamp powered at a maximum of 24 V 15W.




5.3. TERMINAL BOARD CN3

5.3.1. CLOSURE TRAVEL LIMIT DEVICE

"**COMF - FCC**" terminals. Normally closed contact. It intervenes on the gate's closing motion, defining the start of the slowed down section. The status of this input is signalled by LED **DL5**.

5.3.2. OPENING TRAVEL LIMIT DEVICE

"**COMF - FCA**" terminals. Normally closed contact. It intervenes on the gate's opening motion, defining the start of the slowed down section. The status of this input is signalled by LED **DL6**.

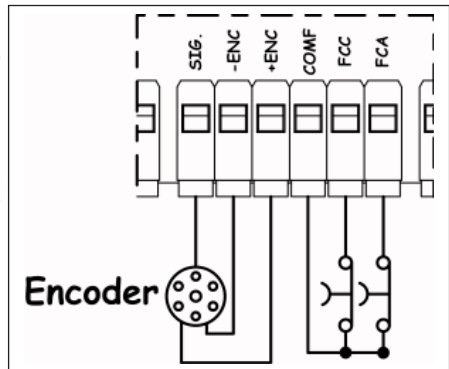
 • The travel limit devices cannot be used to stop gate motion immediately

5.3.3. ENCODER

"**SIG. - -ENC - +ENC**" terminals. Use the encoder supplied with the control unit. Connect the return signal from terminal "**S**" of the encoder to terminal "**SIG**"; to terminal "**-ENC**" connect terminal "**V-**" of the encoder and to terminal "**+ENC**" connect terminal "**V+**" of the encoder.

 **Use of the encoder is absolutely necessary for correct operation of the control unit.**

To ensure correct operation of the encoder, respect the connection described above.



5.4. TERMINAL BOARD CN4

5.4.1. TOTAL OPENING

"COM2 – OPEN A" terminals. Normally open contact. Connect, to these terminals, any pulse generator (push-button, key selector, etc...) which by closing a contact, generates a total opening or closing impulse of the gate. The operation of this contact is defined by operating parameter "D", see paragraph 9.



• A total opening impulse always has priority over pedestrian opening.

• To connect several pulse generators, connect the devices in parallel.

5.4.2. PEDESTRIAN OPENING

"COM2 – OPEN B" terminals. Normally open contact. Connect, to these terminals, any pulse generator (e.g. push-button, key selector, etc...) which, by closing a contact, generates a partial opening or closing impulse of the gate. Opening for pedestrians corresponds to 30% of the memory-stored total opening.



• A total opening impulse always has priority over pedestrian opening.

• To connect several pulse generators, connect the devices in parallel.

5.4.3. STOP

"COM2 – STOP" terminals. Normally closed contact. Connect, to these terminals, any safety device (e.g. pressure switch, edge etc...), which, by opening a contact, causes the gate to stop immediately and disables any automatic function. The status of this input is signalled by LED "DL2". The gate resumes its memory-stored cycle only by means of another total or partial opening pulse.



• If no STOP devices are connected, jumper connect the input.

• To connect several STOP commands, connect the devices in series.

5.4.4. CLOSING SAFETY DEVICES

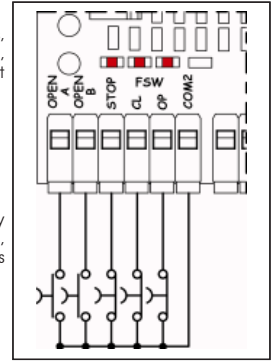
"COM2 – FSW CL" terminals. Normally closed contact. Connect, to these terminals, any safety device (photocell, safety edge, pressure switch etc...) which, by opening a contact, affects the gate's closing motion, causing it to reverse to the opening position. The status of this input is signalled by LED "DL3".

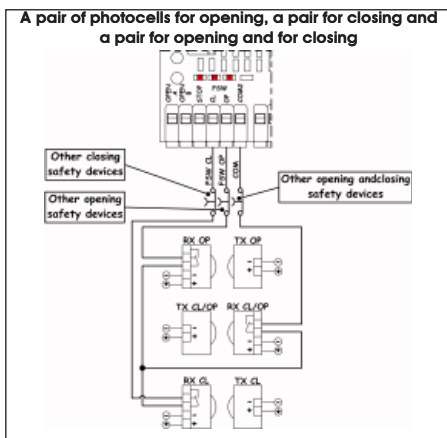
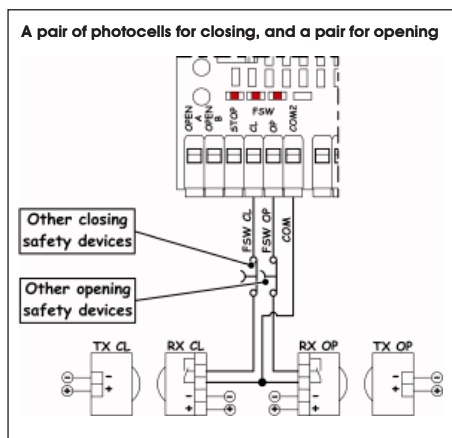
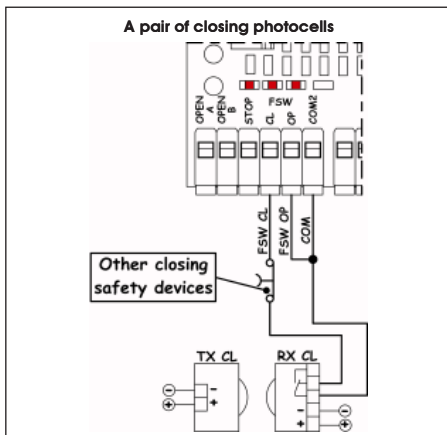
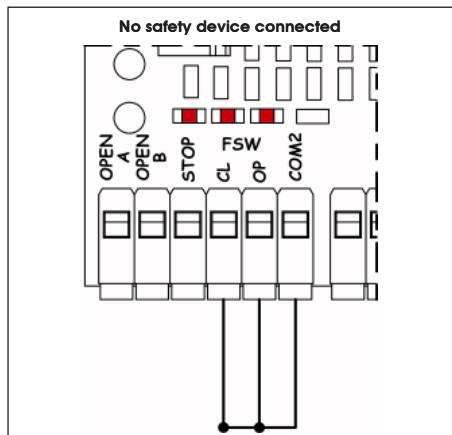
5.4.5. OPENING SAFETY DEVICES

"COM2 – FSW OP" terminals. Normally closed contact. Connect, to these terminals, any safety device (photocell, safety edge, pressure switch etc...) which, by opening a contact, affects the gate's opening motion, causing it to reverse to the closing position. The status of this input is signalled by LED "DL4".



• For correct connection of safety devices, consult the following images:





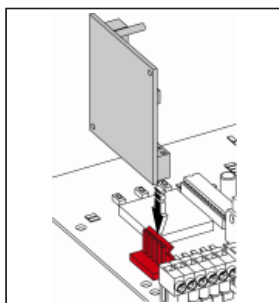
6. INSTALLING THE RADIO CONTROL RECEIVER BOARD

The control unit is designed to house a 5-pin radio-receiver module. Installation procedure: turn off electrical power and fit the module in connector **CN5** on the control unit.



To avoid damaging the receiver and thus irreparably compromising its operation, the receiver must be installed, observing the fitting direction specified in the figure at the side.

Follow the instructions of the radioreceiver to memory-store the radiocontrol.



7. CONTROL LEDES

LEDS	ON	OFF
DL1	Power supply by toroidal transformer	Power supply by batteries or no power supply
DL2	Stop command not activated	Stop command activated
DL3	Closing safety device not engaged	Closing safety device engaged
DL4	Opening safety device not engaged	Opening safety device engaged
DL5	Closing limit switch not engaged	Closing limit switch engaged
DL6	Opening limit switch not engaged	Opening limit switch engaged



Indicated in bold: status of LEDs with gate closed, control unit powered, and both travel limit devices installed.

- If the travel limit devices are not used, jumper connect the relevant inputs; LEDs **DL5** and **DL6** must be lighted.
- If no **STOP** devices are connected, jumper connect the input , the **DL2** LED must be lighted.
- If the **safety devices** are not connected, jumper connect the relevant inputs – LEDs **DL3** and **DL4** must be lighted.

8. OPERATION OF DISPLAY

The control unit has a handy display for viewing and programming the operating parameters.

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

DISPLAYED VALUE	GATE STATUS
- -	Gate at rest
□ P	Gate opening or opened (Only with automatic closure not enabled)
⋮ c	Gate open in pause status (Only with automatic closure not enabled)
□ L	Gate closing

9. ADJUSTING THE OPERATING PARAMETERS

The operating parameters of the control unit are identified by two characters, one letter, lower case or upper case, and the number. The letter identifies the parameter we are modifying, and the number the set value. For example, if "P2" appears on the display, this means that we are modifying the power of the motor and the sensitivity of the electronic clutch, letter A, which is currently on value 2.

To access operating parameter adjustment, follow the instructions below:

1. When you have made all the necessary connections, power up the system and check if all the signalling LEDs are in the situation specified in paragraph 7.
2. The display shows value "--".
3. Press and hold down push-button **P2** until the display shows the name and value of the first parameter.
4. Press push-button **P1** to change the value of the parameter.
5. To move on to the next parameter, press push-button **P2**.
6. 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 with push-button **P2**. When the displays shows value "--", you have returned to normal operation.

The following table summarises all settable parameters and the assignable values.

DISPLAY	DESCRIPTION
Adjustment of sensitivity of the electronic clutch and of motor power.	
A1	Minimum motor power, more sensitive to obstacle
A2	Medium-low motor power, medium-high sensitivity to obstacles
A3	Medium-high motor power, medium-low sensitivity to obstacles
A4	High motor power, low sensitivity to obstacles
Automatic Reclosure: this function enables or disables automatic gate reclosing	
c0	Disabled
c1	Enabled
Operation of OPEN A command: this function determines the behaviour of the OPEN A (total opening) push-button.	
d0	Opens / Closes / Opens
d1	Opens / Stops / Closes / Stops
Condominium function: if this function is enabled while the gate is being opened, the start command is disabled.	
E0	Disabled
E1	Enabled
Courtesy light/ Flashing lamp: with this parameter, you can select the type of output from the LAMP - LAMP terminals, selecting from flashing lamp and courtesy light. IMPORTANT: Maximum load of terminals: 24 Vdc 15W max.	
G0	Flashing lamp
G1	Courtesy light (active for about 2 minutes)
Slow-down point percentage: this parameter is used to set the length of the slowed down section, selecting it from the four fixed values	
H1	10% of maximum memory-stored opening
H2	20% of maximum memory-stored opening
H3	30% of maximum memory-stored opening
H4	40% of maximum memory-stored opening
Speed during slowed-down phase: this parameter is used to set motor speed during the slowed down phase, selecting it from the two values	
i0	High
i1	Low
Operation with encoder or encoder+travel limit device: with this function, you can choose the type of automated operation. When operating only with the encoder, at the end of the closing manoeuvre the control unit commands brief motion in order to facilitate a possible release operation.	
L0	Operation with encoder only
L1	Operation with encoder and travel limit device
Pre-flashing at closure: if this function is activated before the closing phase, the flashing lamp pre-flashes to indicate that the gate is about to move. Pre-flashing time is about 1.5 seconds and cannot be modified.	
r0	Pre-flashing excluded
r1	Pre-flashing ON
Immediate closure: if this function is activated, when the gate is open during a pause, and therefore with Automatic, Automatic step-by-step or condominium logics, when one transits in front of the photocells active during closure or during opening and closure, the gate closes immediately, without waiting for the programmed pause time to elapse.	
s0	Immediate closure disabled
s1	Immediate closure enabled
Immediate closure/timer command: this function enables you to command immediate closure of the gate or to close it with the OPEN A total opening command. This function is only active in combination with function logics with automatic closure of the gate (Automatic, Step-by-step Automatic and Condo).	
P0	Immediate closure: when the gate is open during a pause given with the OPEN A command, the gate begins the closing manoeuvre without waiting for pause time to elapse.
P1	Timer Function: when the gate is open during a pause, with a single impulse of the OPEN A command, the control unit restarts counting the pause time before reclosing. If you keep pressing the OPEN A command, the pause time count stops and the gate stays open until the OPEN A command is active. When you release the command, the gate recloses when pause time has elapsed.
Soft Block Function: this function is used to activate brief braking of the gate before gate motion is stopped	
r0	Function not active: leaf stops immediately
r1	Function active: gate brakes briefly before it stops

10. PROGRAMMING

During the programming procedure, the control unit memory-stores the mechanical contact points during opening, closing and any pause time before re-closing.

1. Release the gearmotor and position the gate at about halfway of open position. Re-block the gear motor.
2. Power up the control unit and check if value "--" is shown on the display.
3. Press and hold down key **P2** until the display shows the first parameter and relevant value.
4. Give an **OPEN A** command to any device connected to this input - the display shows value "Pr", and the leaves begin to move. The first manoeuvre performed by the leaves must be closing. If this does not happen, stop gate movement by pressing the "RESET" push-button. Power down, and then reverse the wires of the motor (**APM1** and **CHM1** terminals). Resume the programming procedure from point 1.
5. When the closing mechanical stop point or travel limit device is reached, the gearmotor pauses for about 2 seconds, and then restarts with a total opening manoeuvre up to the opening mechanical stop point or up to the relevant travel limit device.
6. When the opening position has been reached, the pause time count begins. This happens also if automatic re-closure of the gate has not been enabled
7. When the required time has elapsed, give another **OPEN A** pulse, and the gate will begin to close.
8. When the closing stop point or relevant travel limit device has been reached, programming has terminated, and the display shows value "--".



The display shows value "Pr" during the entire programming procedure.

- The flashing lamp stays lighted on steady beam during the entire programming time.*
- During the programming procedure, leaf movement is slowed down.*

11. OPERATION OF ELECTRONIC CLUTCH

A very important device for reasons of safety. Its setting stays unchanged long-term, without wear. It is active during both closing and opening. When it operates, it reverses gate movement without disabling automatic closing if enabled. If the clutch operates several consecutive times during the closing movement, the control unit goes into **STOP** status, disabling any automatic command. If the clutch operates several consecutive times, means that the obstacle remains and it could be dangerous to perform any manoeuvre. To restore normal operation, the user must give an **OPEN A** / **OPEN B** pulse.

12. PROTECTION FUSES

FUSE	PROTECTION	FUSE	PROTECTION	FUSE	PROTECTION	FUSE	PROTECTION
F1=T10A 250V - 5x20	Power supply 24Vac	F2= Self-re- setting	Flashing lamp	F3= Self-re- setting	Battery-char- ger	F4= Self-re- setting	Supply to ac- cessories

13. FUNCTION LOGICS

Logic "A" Automatic C=1 d=0 E=0

Gate status	Pulses					
	Open A	Open B	Stop	Opening safety devices	Closing safety devices	OP/CL safety devices
Closed	Opens gate and recloses after pause time	Partially opens the leaf and recloses after pause time	No effect (OPEN disabled)	Disables OPEN commands	No effect	Disables OPEN commands
Open in pause	P=0 Closes immediately P=1 Reloads pause time; if held down, it stops gate movement; on release, it recloses after pause time	Closes the gate immediately	Stops operation	No effect	O=0 at release, and providing pause time has elapsed, recloses after 5 seconds, otherwise, it recloses when pause time is up	O=0 at release, and providing pause time has elapsed, recloses after 5 seconds, otherwise, it recloses when pause time is up
At closure	Reverses gate movement	No effect	Stops operation	No effect	Reverses motion	Stops operation and reverses after release
At opening	Reverses gate movement	No effect	Stops operation	Reverses gate movement	No effect	Stops operation and restarts after release

Logic "AP" Step-by-step Automatic C=1 d=1 E=0

Gate status	Pulses					
	Open A	Open B	Stop	Opening safety devices	Closing safety devices	OP/CL safety devices
Closed	Opens gate and recloses after pause time	Partially opens the leaf and recloses after pause time	No effect (OPEN disabled)	Disables OPEN commands	No effect	Disables OPEN commands
Open in pause	P=0 Closes immediately P=1 Reloads pause time; if held down, it stops gate movement; on release, it recloses after pause time	Closes the gate immediately	Stops operation	No effect	O=0 at release, and providing pause time has elapsed, recloses after 5 seconds, otherwise, it recloses when pause time is up	O=0 at release, and providing pause time has elapsed, recloses after 5 seconds, otherwise, it recloses when pause time is up
At closure	Stops gate motor and opens after next pulse	No effect	Stops operation	No effect	Reverses motion	Stops operation and reverses after release
At opening	Stops gate motor and closes after next pulse	No effect	Stops operation	Reverses gate movement	No effect	Stops operation and restarts after release

Logic "E" Semi-automatic C=0 d=0 E=0						
Pulses						
Gate status	Open A	Open B	Stop	Opening safety devices	Closing safety devices	OP/CL safety devices
Closed	Opens the gate	Executes partial opening	No effect (OPEN disabled)	Disables OPEN commands	No effect	Disables OPEN commands
Open	Closes the gate	Closes the gate	No effect (OPEN disabled)	No effect	Saves the OPEN command and closes at release	Disables OPEN commands
At closure	Reverses gate movement	No effect	Stops operation	No effect	Reverses gate movement	Stops operation and reverses after release
At opening	Reverses gate movement	No effect	Stops operation	Reverses gate movement	No effect	Stops operation and restarts after release
Logic "EP" Step-by-Step Semi-automatic C=0 d=1 E=0						
Pulses						
Gate status	Open A	Open B	Stop	Opening safety devices	Closing safety devices	OP/CL safety devices
Closed	Opens the gate	Executes partial opening	No effect (OPEN disabled)	Disables OPEN commands	No effect	Disables OPEN commands
Open	Closes the gate	Closes the gate	No effect (OPEN disabled)	No effect	Saves the OPEN command and closes at releases	Disables OPEN commands
At closure	Stops gate motor and opens after next pulse	No effect	Stops operation	No effect	Reverses gate movement	Stops operation and reverses after release
At opening	Stops gate motor and closes after next pulse	No effect	Stops operation	Reverses gate movement	No effect	Stops operation and restarts after release
Logic "D" Condominium C=1 d=0 E=1						
Pulses						
Gate status	Open A	Open B	Stop	Opening safety devices	Closing safety devices	OP/CL safety devices
Closed	Opens gate and recloses after pause time	Partially opens the leaf and recloses after pause time	No effect (OPEN disabled)	Disables OPEN commands	No effect	Disables OPEN commands
Open in pause	P=0 Closes immediately P=1 Reloads pause time; if held down, it stops gate movement; on release, it recloses after pause time	Recloses the gate immediately	Stops operation	No effect	O=0 at release, and providing pause time has elapsed, recloses after 5 seconds; otherwise, it recloses when pause time is up	O=0 at release, if pause time has elapsed, recloses after 5 seconds; otherwise it recloses immediately Stops operation and reverses after release
At closure	Reverses gate movement	No effect	Stops operation	No effect	Reverses gate movement	Stops operation and reverses after release
At opening	No effect	No effect	Stops operation	Reverses gate movement	No effect	Stops operation and restarts after release

14. HOW TO SECURE THE BOARD

The outdoor enclosure is designed to house the control unit, the toroidal transformer and any buffer batteries (Optional).


To secure the toroidal transformer and the board support, consult the specific instructions.

To secure the control board, follow the instructions below:

1. Position the supplied spacers (Ref. ①) on the columns identified by the following letters: **D-L-O-P-R-H-E**.
2. Secure the board using the supplied screws (Ref. ②).

 The spacer located on letter **O** serves only as a rest for the board.

3. Locate the cables required for your installation.
4. To position and wire the battery kit, refer to the relevant instructions.

 **If you are using the battery kit, YOU MUST clear the pre-drilled hole in the lower part of the enclosure (Ref. ③) as specified by current safety laws.**

