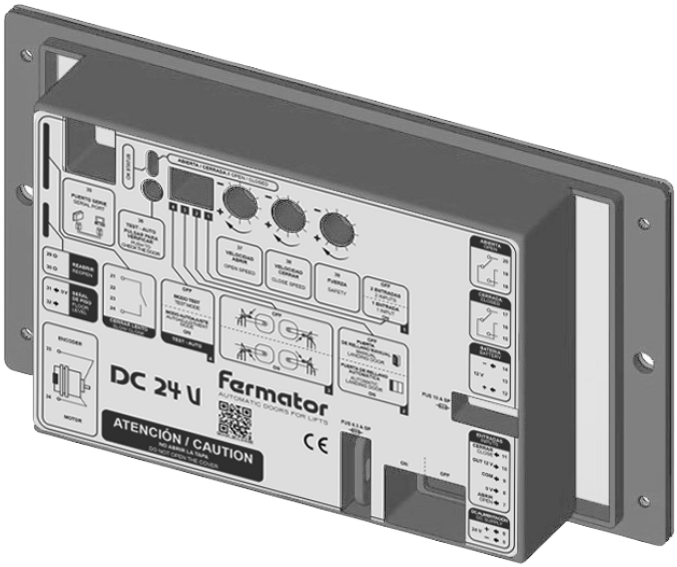
Fermator

AUTOMATIC DOORS FOR LIFTS

ENG

User manual.
Automatic horizontal sliding car door.
Component: DC 24 V Electronic Module.



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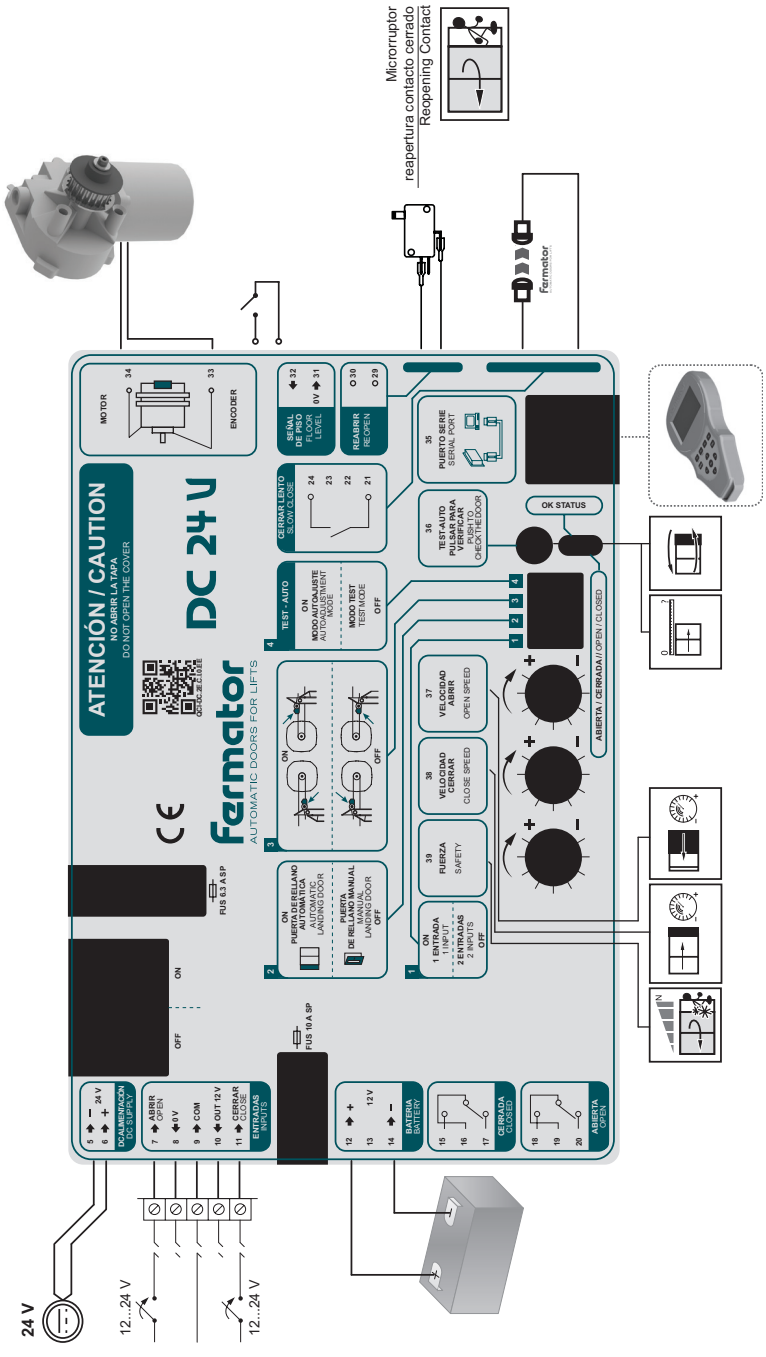
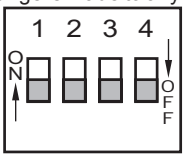

Microrruptor
reapertura contacto cerrado
Reopening Contact
Fermator
ATENCIÓN / CAUTION
NO ABRIR LA TAPA
DO NOT OPEN THE COVER
DC 24 V
Fermator
AUTOMATIC DOORS FOR LIFTS
MOTOR
ENCODER
SEÑAL DE PISO
FLOOR LEVEL
REABRIR
REOPEN
CERRAR LENTO
SLOW CLOSE
PUERTO SERIE
SERIAL PORT
TEST AUTO PULSAR PARA VERIFICAR
PUSH TO CHECK THE DOOR
OK STATUS
TEST - AUTO
MODO AUTOAJUSTE
AUTOADJUSTMENT MODE
MODO TEST
TEST MODE
PUERTA DE RELLANO AUTOMÁTICA
AUTOMATIC LANDING DOOR
PUERTA DE RELLANO MANUAL
MANUAL LANDING DOOR
1 ENTRADA
1 INPUT
2 ENTRADAS
2 INPUTS
FUSIBLE
SAFETY
VELOCIDAD CERRAR
CLOSE SPEED
VELOCIDAD ABRIR
OPEN SPEED
ABIERTA / CERRADA / OPEN / CLOSED
FUS 6,3 A SP
FUS 10 A SP
ALIMENTACIÓN
DC SUPPLY
ENTRADAS
INPUTS
BATERÍA
BATTERY
CERRADA
CLOSED
ABIERTA
OPEN
24 V
12...24 V
12...24 V

The unit has to be programmed using the DIP switches on the front of the unit. If any change is made to any of the above switch selections the unit must be switched OFF and ON again to read the new programming. It is also recommended to then carry out the learning cycle.



The switches functions are:

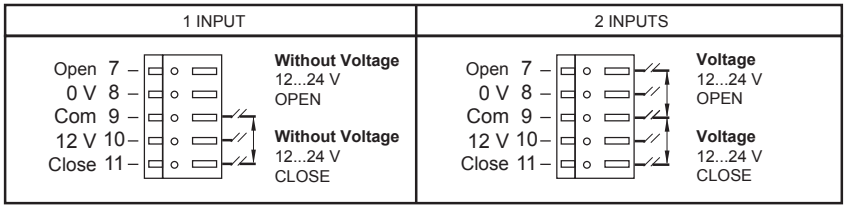
1 **1 & 2 Inputs.**

ON: 1 Input.

The door control unit will be controlled by a single input. Any voltage between 12 to 24 V DC applied between terminals 9 & 11 will close the doors. Without an active input the door remains open. When it activates the door close. The open input is not used.

OFF: 2 Inputs.

The door control module will be controlled by two independent inputs. Any voltage between 12 to 24 V DC applied between terminals 9 & 11 will cause the doors to close. The voltage applied between terminals 7 & 9 will cause the doors to open. In the absence of a signal, the doors will remain static. If both inputs are applied then the open signal has priority.



2 **Automatic / Semiautomatic.**

ON: Automatic.

Operators with clutch (automatic landing). In this case a special movement is made for locking and unlocking the clutch.

OFF: Semiautomatic.

Operators without clutch (Semiautomatic landing door).

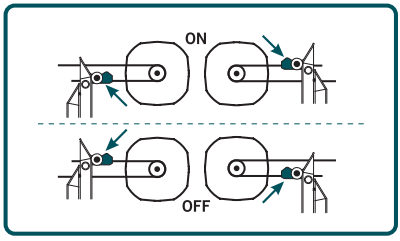
3 **Rotation sense.**

ON: Look at the picture.

- Clutch fixed on the bottom side of the belt and the motor on the right side.
- Clutch fixed on the top side of the belt and the motor on the left side.

OFF: Look at the picture

- Clutch fixed on the top side of the belt and the motor on the right side.
- Clutch fixed on the bottom side of the belt and the motor on the left side.



4 **Test-auto button mode.**

ON: Auto adjustment mode.

When the test-auto button is pushed the door control unit will execute the auto-adjustment process to recognise the clear opening of the door.

OFF: Test mode.

When the test-auto button is pushed the door control unit will cause a door open or close cycle.

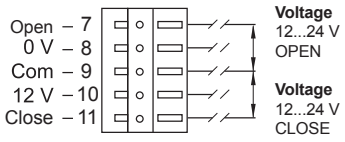
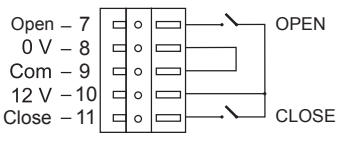
INPUTS

5 / 6 **Power inputs 24 V DC.**

The circuit has been designed to operate on a mains supply of 24 V DC (±15%).
The unit will consume approx 3 A maximum from the supply.

Control inputs.

The circuit can work with external voltage inputs or by means of a volt free contact input.

EXTERNAL VOLTAGE INPUT	VOLT FREE CONTACT INPUT
	

7 **Opening Signal.**

Is a signal that orders the door to open. The voltaje to apply could be from 12 to 24 V DC with an external supply between this input and common (9).

8 **0 Volts.**

Is the opposite pole to 12 Volts. In the case of using the internal voltage supply it should be connected to the acommon input.

9 **Common.**

Is the reference used for the two inputs.

10 **12 Volt.**

Isolated 12 Volt output available to control the door via a volt free contact.
Features are:

a) This supply must only be used for this purpose.
b) This contact must be isolated from any other power supply.

11 **Close signal.**

This signal is used for ordering to close the door.

IMPORTANT: The lift controller must maintain the close signal all the time when the lift is in movement. When the lift controller does not maintain the close signal the clutch will be open and the door will be able open with a force not greater than 300 N (point 5.3.15.1 of EN 81-20/50).

12 / 13 / 14 **Battery.**

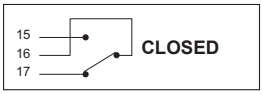
This input is for connecting a 12 V battery 2 Ah to act as an external emergency power supply and allows the opening movement of the door in case of a power failure. It is able to give power for 15 seconds to allow passenger rescue.

Output relays.

Output relays have been provided to give continuous information to the main lift controller concerning the status of the doors.

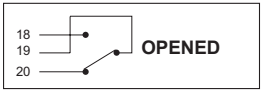
15 / 16 / 17 **Closed.**

Relay activated when the doors are fully closed and locked.



18 / 19 / 20 **Open.**

Relay activated when the doors are fully open.



LED INDICATORS:

Open/Closed.

Led indicated the status of the door.

LED	Door status
Illuminates green	The door is fully open
Illuminates red	The door is fully closed
Illuminates orange	an alarm is activated
Blinking green	The photocell is obstructed

Ok status.

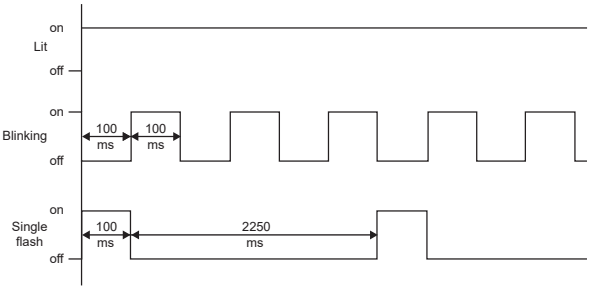
Red LED indicates proper working conditions.
Depending on how the DC 24 is powered the red LED illuminates up in different ways:

Red LED	24 V power supply	12 V battery
Illuminates	✓	✗
Blinking	✓	✓
Single flash	✗	✓

– LED lighting: constantly on.

– LED blinking: iso-phase on and off with a frequency of approximately 5 Hz: on for approximately 100 ms followed by off for approximately 100 ms.

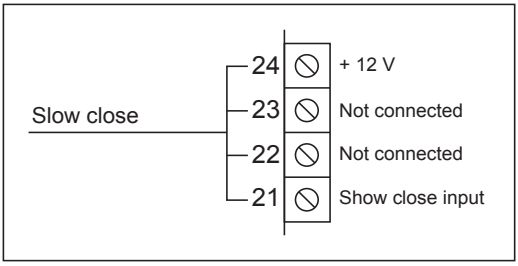
– LED single flash: one short flash (approximately 100 ms) followed by a long off phase (approximately 2.250 ms).



Indicator states and flash rates.

21 / 22 / 23 / 24 **Slow close input.**

The slow close is enabled by the pins 21 and 24:



29 / 30 **Reopen.**

This signal is for installing the cabin door pushbutton or an external detector barrier. This signal has priority over the closing signal. They do not activate when the door is closed. The door will only reopen if this signal is free (Normally Closed).

31 / 32 **Floor level.**

This input controls the open movement of the door. When the lift is at a floor level it allows the opening movement. The door only will open if this signal is bridged (Normally Open).

33 **Encoder.**

An integral quadrature pulse encoder is connected to this input. The purpose of the encoder, which is situated inside the motor, is to inform the control of the exact position and speed of doors.

34 **Motor.**

Output to the 24 DC motor to control speed and torque. The DC 24 motor controller is formed by a power stage with a feedback speed control circuit with voltage compensation and current limiting protections (Imax).

35 **Serial Port.**

The serial port is used to connect with external devices like the diagnostic console, interfaces and future expansion devices. Operating speed 1.200 Baud, current loop.

36 **Test push-button.**

Test mode.
Operation of the Test pushbutton will cause a door open or close cycle.

Auto adjustment mode.
The auto adjustment pushbutton is used to set up the doors. The doors will carry out a complete movement to detect the clear opening. Once the auto adjustment has been completed the parameters are stored in non-volatile EEPROM and will be used to calculate the optimum performance. Auto adjustment only needs to be used when setting the initial parameters or when connecting or disconnecting the photocell (barrier device).

Auto adjustment mode.
-Disconnect the inputs (Pins 7, 8, 9, 10 & 11).
-Switch OFF the DC 24 and place the doors in the closed position.
-Switch ON the DC 24 and push the autoadjustment button.

1. When the unit is switched on and the first control signal is received or the auto-adjustment button is pushed the unit looks for the position reference at the closed position.
2. Then the first open movement is carried out at low speed checking the encoder pulses in order to determinate the Clear Opening of the door.
3. This value is saved in the memory and the normal curve movements are established.

37 **Open speed.**
The door opening speed can be independently adjusted from 200 mm/s upto 700 mm/s.

38 **Close speed.**
The door closing speed can be independently adjusted from 150 mm/s upto 400 mm/s.

39 **Safety.**
This potentiometer is used to set the closing pressure onto an obstacle in the doorway. The closing pressure can be set between 40 and 150 Nw.

40 **On/Off switch.**
Disconnects the unit from the DC 24 V mains supply.

LIFT STANDARD EN 81-20/50

In this section the modifications are listed for customer awaraness in order to comply with the new lift standard EN 81-20/50.

Is important to enable the EUNAP option inside the Option Menu with the programming console (spare part ref. VCP-VFCP.C00) and carry out an auto adjustment. Remember to activate the full protection if you want to keep the configuration. The EUNAP option is enabled by default.

IMPORTANT: The lift controller must maintain the close signal all the time when the lift is moving. When the lift controller does not maintain the close signal the clutch will be open and the door will be able open with a force not greater than 300 N (point 5.3.15.1 of EN 81-20/50).

Kinetic energy.

The average closing speed has to be limited to 10 J. To limit this it is necessary to know the moving mass, the door opening and the number of door panels. These parameters are programmed by default except when delivered as a spare part. In this case the parameters have to be introduced by the programming console (spare part ref. VCP-VFCP.C00). These options are available in programming tools delivered since 01/07/2016.

To modify the parameters with the console it is necessary to join Kinet Menu → Inputs Menu → Inside there are the parameters “Kinetic Energy Limit”, “Force Limit 150 N”, “Glass Door”, “Door type”, “Panels number” and “Door mass kg”.

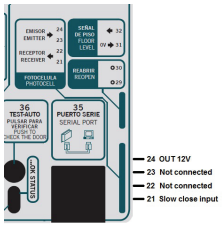
Instructions: Enable the “Kinetic Energy Limit”. Then enable “Force Limit 150 N” option and depending if the door is a glass door or not enable or disable the “Glass door” option. After that configure the “Door type”, “Panels number” and “Moving mass kg”.

To know the moving mass check the Annex 1 and for examples check the Annex 2.

Light curtain.

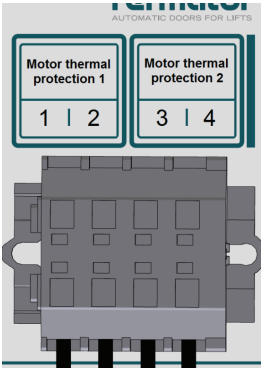
The light curtain is mandatory and has to be connected to the lift controller.

In case of failure or deactivation of the light curtain the kinetic energy of the doors must be limited to 4J. To limit it the lift controller has to activate the slow close input, pin 21 and 24 of DC 24 V.



Overheating protection.

Two temperature sensors are added in the motor winding to measure the temperature and protect the motor against overheating. These sensors are normally closed and the signals are connected in a 2-conductor terminal strip:



The motor thermal protection 1 is the sensor that indicates the motor is close to the critical temperature. In this case the lift controller must stop the car at a landing so the passengers can leave.

The motor thermal protection 2 is the sensor that indicates the motor has reached the critical temperature. Then the lift controller has to remove the DC 24 V supply voltage.

The maximum contact rating is 3 A 250 Vac.

Door contact.

A separate monitoring signal is necessary to check that the car door(s) is/are in the closed position. To comply with this requirement an additional door contact is added and the signal should be connected to the lift controller.

The maximum contact rating is 2 A 230 Vac.

POWER SUPPLY

• DC voltage range:	24 V	±15% DC.
• Stand by power:	70 mA	1,7 W.
• Open door power:	0,93 A	21,5 W.
• Nominal power:	0,51 A	12 W.
• Maximum power:	2 A	50 W.

PWM REGULATION

• PPWM frequency:	15 KHz.
• Voltage range:	0 to 24 V DC III.
• Maximum output current:	2 A.
• Positional control:	Quadrature encoder.

MOTOR

• Type of motor:	Brushed DC motor
• Voltage supply:	24 V.
• Power:	50 W.
• Enclosure class:	IP 30.
• Nominal speed:	270 RPM.

INPUTS

• Impedance:	8,2 K Ω.
• Voltage:	12 to 24 V AC / DC.

OUTPUTS

• Contacts:	Switched.
• R. contact:	50 mW.
• Swich:	5 ms.
• Output current:	Máximum: 5 A
• Voltage:	250 V

PERFORMANCE

• Open Speed:	100 to 400 mm/s.
• Close speed:	100 to 350 mm/s.
• Maximum acceleration:	100 to 500 mm/s^2.

40/10 Product line

#	Model	Opening	Number of panels	PL [mm]	HL [mm]	Panel type	Fire homologation	Moving mass [Kg]
0	40/10 DC 24 V model	Side(1)	2	800	2.000	Sheet metal	F.R. E120	31,61

#	Concept	Multiplier factor
1	Difference from T2(2) to T3	0,08
2	Difference from T2 to C2(3)	0,00
3	Difference from T2 to C4	0,26
4	Difference of 100 mm in PL	0,07
5	Difference of 100 mm in HL	0,03
6	Difference from F.R. E120 to F.R. EI30	0,19
7	Difference from F.R. E120 to F.R. EI60	0,19
8	Difference from F.R. E120 to F.R. EI120	0,25
9	Difference from sheet metal panels to Double skin panels	0,32
10	Difference from sheet metal panels to Flush big vision panels	1,02
11	Difference from sheet metal panels to Full glass in skirting panels	0,95
12	Difference from sheet metal panels to Wien type vision panels	0,32
12	Difference from sheet metal panels to Vision panels	0,61

1. Opening type = side means the door is telescopic type. This is the reason it uses T2 and not S2.
2. T2 means T = Telescopic door (opening type side), and 2 is the number of panels.
3. C4 means C = Central door, and 4 is the number of panels.

ANNEX 2

Example 1: Increment of PL and HL

Door to be calculated:						
Model	Opening	Number of panels	PL [mm]	HL [mm]	Panel type	Fire protection
40/10 DC 24 V model	Side	2	900	2.100	Sheet metal	F.R. E120

Taking as basis(1):							
Model	Opening	Number of panels	PL [mm]	HL [mm]	Panel type	Fire homologation	Moving mass [Kg]
40/10 DC 24 V model	Side	2	900	2.100	Sheet metal	F.R. E120	31,61

Calculations:							
Difference per opening	Difference per number of panels	Difference per PL (each 100 mm)	Difference per HL (each 100 mm)	Difference per panel type	Difference per fire homologation	SUM	Moving mass
There are equals	There are equals	31,61 x 0,07(2) = 2,21 Kg	31,61 x 0,03(3) = 0,95 Kg	There are equals	There are equals	2,21 + 0,95 = 3,16 Kg	31,61 + 3,16 = 34,77 Kg

1. These specifications are in the Annex 1.
2. This factor is the increment of 100 mm in PL. There is the number 4 of the second table in the Annex 1.
3. This factor is the increment of 100 mm in HL. There is the number 5 of the second table in the Annex 1.

Example 2: Difference of opening and number of panels + increment of PL and HL

Door to be calculated:						
Model	Opening	Number of panels	PL [mm]	HL [mm]	Panel type	Fire protection
40/10 DC 24 V model	Central	4	800	2.000	Double skin	F.R. E120

Taking as basis(1):							
Model	Opening	Number of panels	PL [mm]	HL [mm]	Panel type	Fire homologation	Moving mass [Kg]
40/10 DC 24 V model	Side	2	800	2.000	Sheet metal	F.R. E120	31,61

Calculations:							
Difference per opening(2)	Difference per number of panels(2)	Difference per PL (each 100 mm)	Difference per HL (each 100 mm)	Difference per panel type(3)	Difference per fire homologation	SUM	Massa móvel
31,61 x 0,26 = 8,22 Kg		There are equals	There are equals	31,61 x 0,32 = 10,12 Kg	There are equals	8,22 + 10,12 = 18,34 Kg	31,61 + 18,34 = 49,95 Kg

1. These specifications are in the Annex 1.
2. This factor is the difference between T2 (side 2 panels) to C4 (central 4 panels). There is the number 3 of the second table in the Annex 1.
3. This factor is the difference between sheet metal panel and double skin panel. There is the number 9 of the second table in the Annex 1.

ATTENTION: Any proposed modification not shown in this manual should be clarified with our Technical Department before actioning.
TECNOLAMA accepts no responsibility for any resultant damage produced in the equipment described in this manual and associated installation if the instructions given have not been followed.
TECNOLAMA reserves the right to modify the product or specifications in this technical brochure without prior notification.

DECLARATION CE OF CONFORMITY

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77380 Combs la Ville (France)

We hereby declare that the products mentioned below conform with the following E.U. council directives:

CE

Norm EN 81-1/2
DIRECTIVE 2006/42/EC (Machinery directive), DIRECTIVE 2014/30/UE (Electromagnetic compatibility), of the European Parliament and of the Council.
Electronic module DC 24 V

Combs la Ville, 12-09-17

Olivier Guillard
General Manager