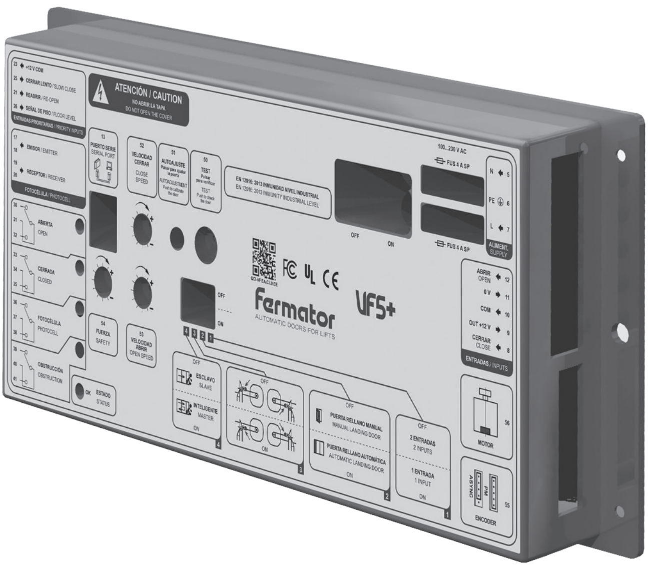
fermator

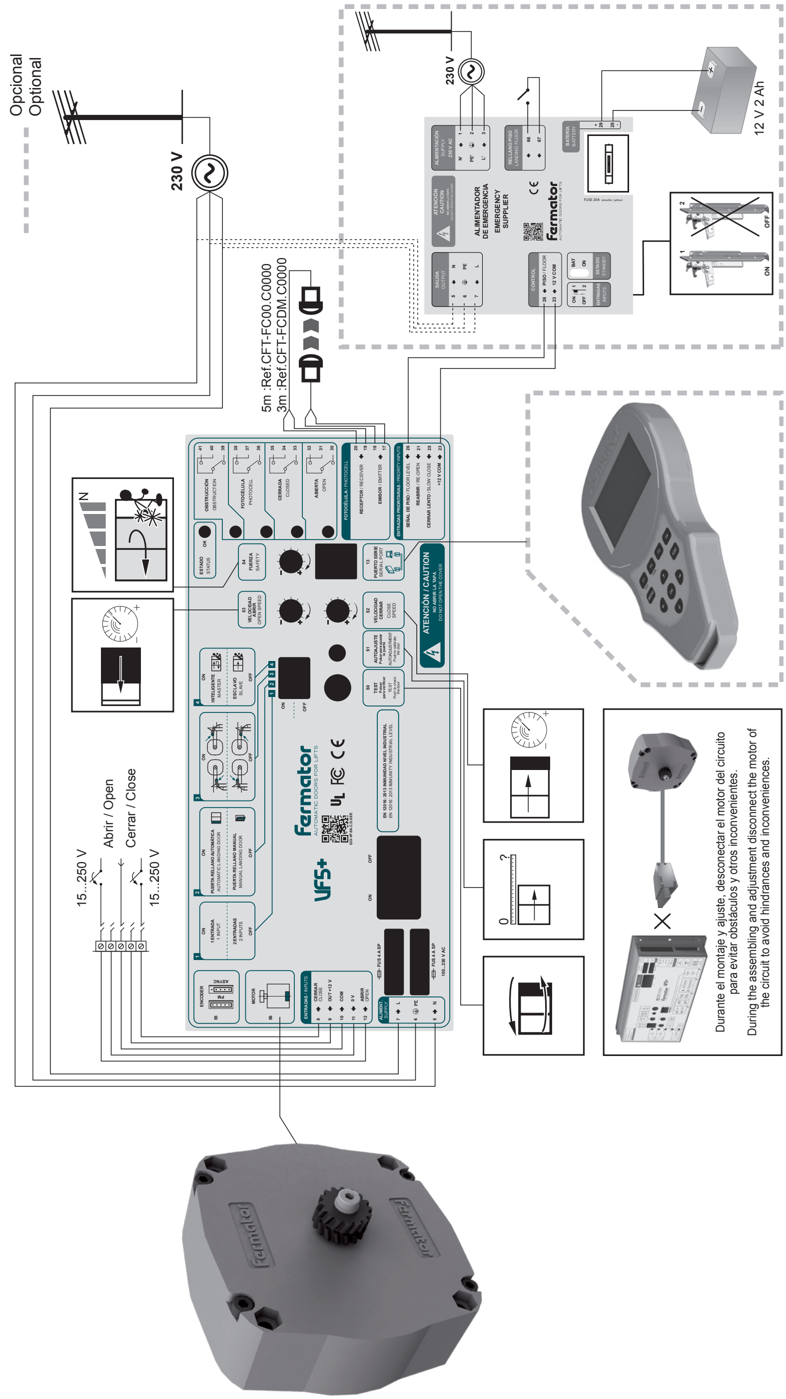
AUTOMATIC DOORS FOR LIFTS

ENG

User manual.
Automatic horizontal sliding car door.
Component: VF5+ Electronic Module.



MAN-MU00000VEENGTC-10.2017


Opcional
Optional
230 V
5m :Ref.CFT-FC00.C0000
3m :Ref.CFT-FCDM.C0000
ALIMENTADOR DE EMERGENCIA
EMERGENCY SUPPLIER
12 V 2 Ah
15...250 V
Abrir / Open
Cerrar / Close
15...250 V
ATENCIÓN / CAUTION
NO ABRIR LA TAPA
DO NOT OPEN THE COVER
VF5+
Durante el montaje y ajuste, desconectar el motor del circuito para evitar obstáculos y otros inconvenientes.
During the assembling and adjustment disconnect the motor of the circuit to avoid hindrances and inconveniences.

The VF may be programmed using the DIP switches on the front of the unit. The main supply of the VF unit MUST be switched OFF during the manipulation of the switches and then it should be switched ON again to read the new programming.

The switches functions are:

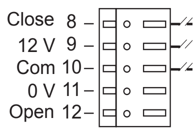
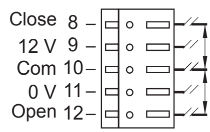
1 **1 & 2 Inputs.**

ON: 1 Input.

The door control unit will be controlled by a single input. Any voltage between 12 V DC to 60 V DC or 100 V AC to 230 V AC applied between terminals 8 & 10 will close the doors. Without input active the door remains opened. Open input is not used.

OFF: 2 Inputs.

The door control module will be controlled by two independent inputs. Any voltage between 12 V DC to 60 V DC or 100 V AC to 230 V AC applied between terminals 8 & 10 will cause the doors to close. And between terminals 10 & 12 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.

1 INPUTS	2 INPUTS
 **Without Voltage** 0 V OPEN **With Voltage** 12 V DC...60 V DC, 100 V AC..230 V AC CLOSE	 **Voltage** 12 V DC...60 V DC, 100 V AC...230 V AC CLOSE **Voltage** 12 V DC...60 V DC, 100 V AC...230 V AC OPEN

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 (manual landing door).

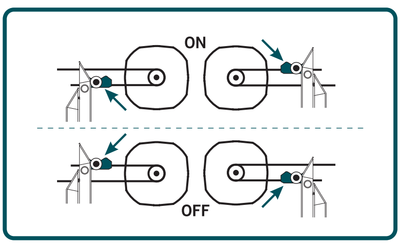
3 **Rotation sense.**

ON: Lock 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: Lock 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 **<u>Master and Slave.</u>**

ON: Master.

The door control unit will execute instructions directly. Example: photocell activation will cause the doors to re-open immediately without control of the door control unit.

OFF: Slave.

There is no automatic reopen movements. The doors will only react to instruction given by the main lift controller. Example: with the photocell activated the unit will send a signal to the main lift controller via the PHOTOCELL output (36, 37, 38). Then, the main lift controller must remove the close signal and put the open signal.

POWER INPUTS

5 / 6 / 7 **<u>230 Volts single phase AC.</u>**

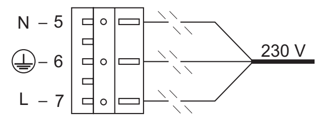
The circuit has been designed to operate on a mains supply of 230 V AC (+10%,-15%, 50 or 60 Hz). The unit will consume on average approximately 1 ampere from the supply.

It is important that the Door Operator Module has a GOOD EARTH CONNECTION.

The VF5+ incorporates a soft-start system to control the bulk capacitors charge and prevent short circuits.

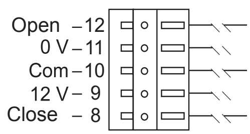
The circuit has been designed to pass the industrial level in immunity test according to the norm EN 12016:2013.

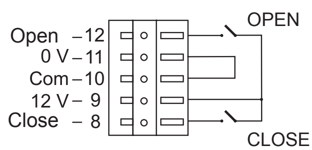
POWER INPUTS CONNECTIONS



CONTROL INPUTS

The circuit can work with external voltage inputs or internal voltage input (voltage free contact).

<table>
<tr><th colspan="2">EXTERNAL VOLTAGE INPUTS</th><th>INTERNAL VOLTAGE INPUTS</th></tr>
<tr><td>
</td><td>Voltage
12 V DC...60 V DC,
100 V AC...230 V AC.
OPEN

Voltage
12 V DC...60 V DC,
100 V AC...230 V AC.
CLOSE</td><td>
</td></tr>
</table>

8 **<u>Close signal.</u>**

This signal is used for ordering to close the door.

IMPORTANT: The lift controller must keep enabled the close signal all the time when the lift is in movement. When the lift controller does not keep enabled 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).

9 **<u>12 V.</u>**

Isolated 12 Volts output available to control the door via a voltage 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.

10 **Common.**
Is the reference used for the opening and closing signal.

11 **0 V.**
Is the opposite pole to 12 V, in the case of using internal voltage it should be connected to common input.

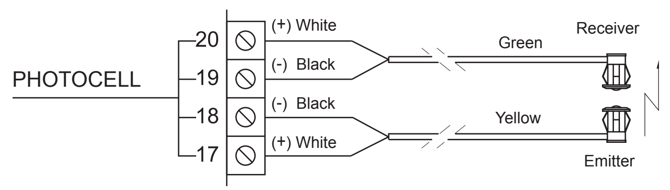
12 **Opening Signal.**
Is a signal that orders the door to open. The tension to apply could be from 12 V DC to 60 V DC or 100 V AC to 230 V AC, with an external supply between this input and common (10).

13 **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 per second, current loop. It is used a RJ11 connector (phone jack connector).

17 / 18 / 19 / 20 **Photocell.**

One of the most relevant characteristics of this control is the optional incorporation of the Fermator photocell. It is composed by a emitter and receptor infrared.

CONNECTION OF THE PHOTOELECTRIC DETECTOR



OTHER INPUTS

21 **Reopen.**

This signal is used for installing the cabin door switch or an external barrier. In order to active this signal, connect the re-open input (21) with the +12 V (23). Use voltage free contacts. The reopening signal has priority over the closing signal.

23 **+ 12 V Com.**

This terminal is used for giving with an isolated contact a reopening order or a slow closing. Always use voltage free contacts and usually open.

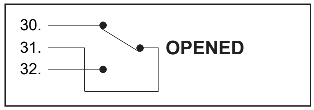
25 **Slow closing.**

This signal is used for ordering to close the door slowly. The slow signal has priority over the control signals and the photocell. It's created for working with detection of fire centres.

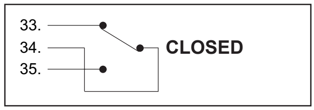
26 **Floor Level.**
This input is for connecting the external emergency supplier that allows the opening manoeuvre in the case of power failure by a battery of 12 V, able to give power during 15 seconds for a passengers rescue.

Output relays have been provided to give continuous information to the main lift controller concerning the status of the doors. The output contacts of the relays may be used by the main lift controller to pilot such information as «doors fully opened», «doors fully closed», «Photoelectric detection», «obstruction in the doorway» and «door control O.K.».

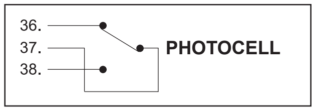
30 / 31 / 32 **<u>Opened.</u>**
Led indicator and relay activated when the doors are fully open.



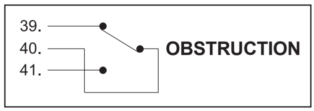
33/ 34/ 35 **<u>Closed.</u>**
Led indicator and relay activated when the doors are fully closed and locked.



36 / 37/ 38 **<u>Photocell.</u>**
Led indicator and relay activated when the photocell or the reopening input is operated.



39/ 40/ 41 **<u>Obstruction.</u>**
Led indicator and relay activated when an obstacle is detected that stops the doors from closing. The signal will reset when the doors reach the opened or closed position.



<u>Status.</u>
Blinking led indicating proper working conditions.

50 **<u>Test push-button.</u>**
Operation of the TEST push-button will cause a door open or close cycle.

51 **<u>Autoadjustment push-button.</u>**
The Autoadjustment push-button is used to set up the doors. With a PM motor installed, the autoadjustment has to be done with the cabin door coupled with the landing door. With an Asynchronous motor installed, the autoadjustment can be done with the cabin door coupled or uncoupled with the landing door. The doors will do 5 complete movements to detect the motor and the clear opening. From the information obtained the microprocessor will calculate the acceleration and deceleration ramps and the braking torque required to give the optimum control of the doors. Once the autoadjustment has been completed the parameters are stored in non-volatile EEPROM and will be used to calculate the optimum performance. The doors will open slowly for the first operation after power has been removed from the door control unit. Autoadjustment only needs to be used when setting the initial parameters or when changes such as connecting or removing the Fermator photocell are made.

Autoadjustment process:

- Switch OFF the VF and place the doors in closed position.
- Disconnect the inputs (Pins 8, 9, 10, 11 & 12) and the priority inputs (Pins 26, 21, 25 & 23).
- Switch ON the VF and Push auto-adjustment button (51).

Next 2 movements are to detect which kind of motor it is installed.

- 1st Movement: The door will open 200mm (If the door instead of opening makes small rebounds, means that it's trying to close and that the direction is the opposite. The pin 3 of the DIP switch has to be changed).
- 2nd Movement: The door will close 150 mm.

Next 3 movements are to detect the clear opening of the door, the 3rd movement is starting 2 or 3 seconds after finishing the second one.

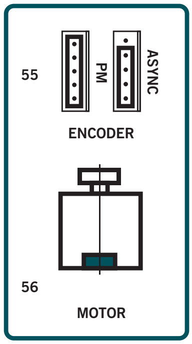
- 3rd Movement: The door will close completely in slow velocity until the end to detect the 0 position.
- 4th Movement: The door will open slowly counting the pulses from the encoder built into drive motor until it reach the open mechanical stop. Will detect the final position.
- 5th Movement: The door will close after a short delay. From the information obtained the microprocessor will calculate the acceleration and deceleration ramps and the braking torque required to give the optimum control of the doors.

52 **Close speed.**
The door closing speed can be independently adjusted from 150 mm/s up to 400 mm/s.

53 **Open speed.**
The door opening speed can be independently adjusted from 200 mm/s up to 700 mm/s.

54 **Safety.**
This potentiometer is used to set the closing pressure onto an obstacle in the clear opening. The closing pressure can be set between 60 and 150 Nm.

55 **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.



Compatibility with Fermator asynchronous motor.

- The VF5+ encoder connector is prepared to connect the high resolution encoder for the synchronous PM motor (5 wires) and the standard encoder from the asynchronous motor (4 wires).
- The encoder from the asynchronous motor (4 wires) has to be connected to the 4 pins of the encoder marked like ASYNC.

56 **Motor.**
Output to the 3 phase motor varying the voltage and frequency to control speed and torque.

57 **ON / OFF Switch.**
Disconnects the unit from the 230 V AC mains supply.

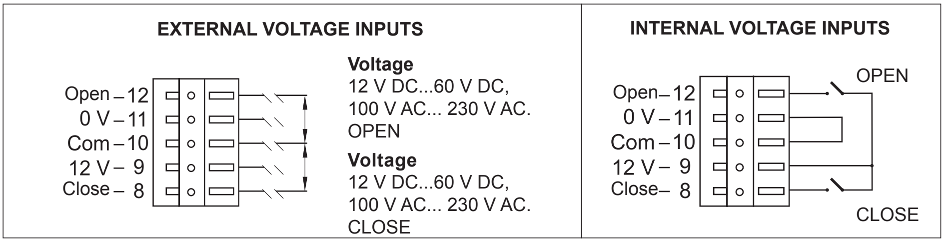
CONNECTION WITH THE LIFT CONTROLLER

If the autoadjustment was correctly passed, then the connections with the lift controller can be assembled. The three potentiometers can be regulated too.

1 **Connect the cables coming from the lift controller.**

- Connect the inputs cables (Pins 8, 9, 10, 11 & 12) and priority inputs cables (Pins 26, 21, 25 & 23).
- Connect the photocell (Pins 17, 18, 19 & 20).
- Connect the relays outputs cables that inform the lift controller (Pins 30 to 41).

Note: Switch off the VF control before connecting the open and close command cables. Do not mix the voltages from the lift controller with the internal ones in the VF control (#9: 12 V and #11: 0 V).



2 Put the potentiometers to the minimum.

- Close Speed (52).
- Open Speed (53).
- Safety (54).

3 Test the door.

- Check from the landing door side.
- Press the «TEST» button and establish the potentiometers (open speed, close speed and the safety force) in order to get the required adjustment.

4 Photocell installation (optional).

- Verify that there is an emitter and a receiver (E mark and R mark on the capsules) connected to the correct cable (emitter to the yellow cable and receiver to the green one).
- Connect the photocell to the electronic module.
- Put the capsules face to face at a minimum distance of 50 cm, make the autoadjustment process without hitting the capsules, once done, make a open and a close movement, and then block the photocell with the hand during the close movement to check that the Photocell relay is active every time the hand is in the middle of the infrared beam.

Note: Remove the photocell wiring from any place where there are “electric noises” such as motors, supplies wiring, etc.

Additional information: The VF parameters can be customized with the Fermator programming tool.

POWER FAILURES

The VF5+ incorporates two new security systems related to power failures:

- **Anti-banging system.**
  When a power failure occurs while the door is opening, closing or fully open, the new anti-banging system brakes the PM motor to perform a slow closing and avoid the door hits at closing.

- **Electronic Car Door Lock.**
  When a power failure occurs while the door is fully closed, the VF5+ detects the voltage drop and opens the Car Door Lock if the cabin is on the floor level. This new security system has to be used with a Car Door Lock without spring.

The Electronic Car Door Lock system could be enable or disabled by software.

Autoadjustment.

- **The control does not answer to the TEST or AUTOADJUSTMENT button.**

  - Switch off and on the controller and test again.

  - Change the controller If nothing happens.

- **The door does not move.**

  - Verify the motor cable and its connection with the motor connector.

  - Verify that a variable voltage is applied to the motor when a movement order is applied. This voltage is different when the door stops closed or open, because in open position a torque to keep the position is needed. The motor voltage has to be checked with the Fermator programming tool. You should change the motor if no movements are made when the voltage is present.

- **The door stops before the end of the learning cycle.**

  Verify the encoder :

  - The door keeps open with no movement → sense of opening reversed, so interchange the 2 middle cables in the connector (55).

  - The door closes and opens only 20 cm then stopping → encoder disconnected, encoder not supplied or damaged, pulley screw wrong tight.

    Change the encoder if nothing solves it.

- **The door opens instead of close.**

  - Verify the DIP switch 3 position.

  - Reverse 2 phases of the motor connection (56).

- **The door makes the learning phase correctly but the clutch stays open with the closed relay active.**

  - Verify the switch 2 according to the correct open sense of the door. The door should be close in the motor zone with the clutch closed too.

- **The door stops in the clutch zone.**

  - Verify by hand the correct and soft movement of the clutch (see the assembling manual).

- **The door does not close completely.**

  - Disconnect the whole system and verify that no obstruction happens.

Normal operation.

- **The door only closes 35 cm.**

  - This is the clear entrance of any controller that has never been adjusted. Therefore an autoadjustment is required (check the autoadjustment process).

- **The door opens but doesn't close.**

  - Check if the photocell LED is activated. If so, verify that the photocell is not blocked or the «OPEN» input is active (8) continuously.

- Check if the close signal (12) arrives to the system using a multimeter or the console. Change the VF control if the voltage arrives, but the door does not close.
- Check if the re-opening signal (21) is activated.
- Check that there is no stray voltage in the open signal.

- **The door re-opens by itself.**
  - Check the sensibility of the re-opening (#54) Safety regulation potentiometer.
  - Check that the photocell is not activated.
  - Check that there is no mechanical obstruction on the door.
  - In case of having the same problem, disconnect the photocell and try again with the TEST button, and if the door doesn't open or close totally there must be a mechanical obstruction on the door.

- **The door doesn't reach the fully open position.**
  - Verify the mechanical adjustments of the door. The motor has enough torque to open the doors in normal circumstances until a Clear Opening of 1400 mm (motor without reduction).

- **The door reopens when the clutch is closing.**
  - Check the regulation of the clutch, because probably the locking system of the clutch is not well adjusted and the door has a mechanical friction. Verify if the the obstruction LED lights.

- **The door hits when it opens.**
  - Check that the clutch unlocking is well fixed before the door starts to open. In case the clutch is not fully fixed you should check the clutch adjustment because it is probably too hard.

- **The door hits when it arrives at the fully open position, the "open" LED is not activated and the system gets out of order.**
  - Check the tension of the toothed belt, because probably is not correctly adjusted and it slips on the pulley of the motor and consequently the encoder is sending a wrong information. Adjust the belt tension and make the autoadjustment again.

- **The system gets power but doesn't work and the led ON is off.**
  - Check if both external fuse are burned and change it for another Fermator fuse (250 V, 4 A ceramic fast speed).

- **The motor is moving intermittently.**
  - Check the wiring connections or if a phase of the motor is failing.
  - Verify that the pulley of the encoder is well assembled.

- **The "ON" LED is activated and the door doesn't obey to the signals.**
  - There has been an obstruction at opening and then the door enters into an "out of order stage" during 15 seconds.
  - In slave mode, there is a continuous obstruction and the lift controller has not changed the close signal by the open signal in slave mode.
  - There has been a short circuit in the output of the motor, and the system will be deactivated during 3 seconds.

Photocell.

- **The photocell is active intermittently.**

  - Check the “grounding” connection (6).

  - Check the correct plugs connection (17 to 20).

  - Disconnect the photocell, make a complete open and close movement, connect again the photocell and try again.

  - Verify that there is an emitter and a receiver (E mark and R mark on the capsules) connected to the correct cable (emitter to the yellow cable and receiver to the green one).

  - Remove the photocell wiring from any place where there are “electric noises” such as motors, supplies wiring,...being sure that the cables are not short-circuited.

  - If you can use a console, please check the stability of the signal.

  - Do not extend the photocell wires.

  - Take in mind that in master mode the system recognizes automatically the photocell detector after making a complete autoadjustment with the beam free controlled by the input signals.

LIFT STANDARD EN 81-20/50

In this section the modifications are listed for customer knowledge 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 do an autoadjustment. Remember to active the full protection if you want to keep the configuration. The EUNAP option is enabled by default.

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

Kinetic energy.

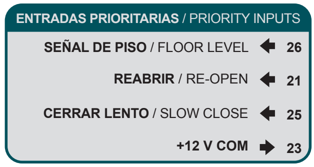
- The average closing speed has to be limited to 10 J. To limit it is necessary to know the moving mass, the door opening and the panels number. This parameters are programmed by default except for the spare part. In this case the parameters have to be introduced by the programming console (spare part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

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

  Instructions: Enable the “Kinetic Energy Limit”. Then enable “Force Limit 150 N” option and depend 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.



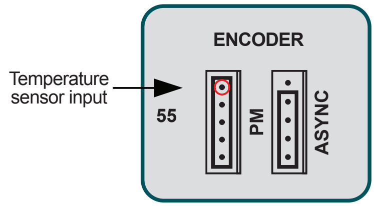
- The light curtain is mandatory and has to be connected to the lift controller.

- 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 25, of VF5+.

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.

- One of the sensors:
  - It indicates the motor is close to the critical temperature.
  - This sensor has to be connected to the lift controller.
  - When the motor arrives to this temperature the lift controller must stop the car at a landing for the passengers can leave.



- The other sensor:
  - Indicates the motor has reached the critical temperature.
  - This sensor has to be connected to the VF5+ in one of the pins of the encoder connector.
  - The VF5+ must to remove the motor supply voltage until the temperature drops and activate an alarm.

- 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. In order to comply this point an additional door contact is added, and the signal has to be connected to the lift controller.

  The maximum contact rating is 2 A 230 Vac.

REFERENCE DATA

Electrical characteristics				
	Minimum	Nominal	Maximum	Units
Voltage input rating:	100	230	300	V AC
Frequency rating:	50	-	60	Hz
Input current rating:	-	-	0,55	A
Output current rating:	-	-	0,85	A
Power input rating:	-	-	126	W
Power output rating:	-	-	100	W

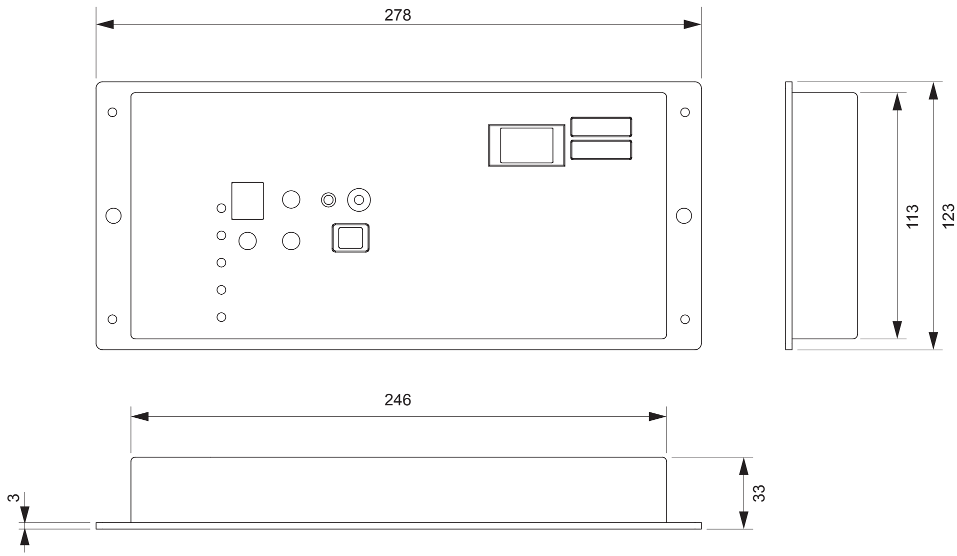
Protection requirements				
Protective class:	Protective Class I (1)			
Residual-current device [RCD]:	RCD Type A [Recommended]			
Over-voltage category:	Over-voltage category III			
Electrical supply system:	Supply earthing systems TT, NT, IT, not corner-earthed.			
Short-circuit current rating [SCCR]:	-	-	1,5	kA
IP rating:	-	-	20	

The accessible connections and parts listed below are of protective class 0. It means that the protection of these circuits relies only upon basic insulation and becomes hazardous in the event of a failure of the basic insulation. Therefore, devices connected to these circuits must provide electrical-shock protection as if the device was connected to supply mains voltage. In addition, during installation these parts must be considered, in relation with electrical shock, as supply mains voltage circuits.

Class 0 circuits:
INPUTS 8, 9, 10, 11, 12.
SERIAL COMMUNICATION 13.
PHOTOCELL 17, 18, 19, 20.
PRIORITY INPUTS 21, 23, 25, 26.
MOTOR ENCODER 55.

Environmental characteristics				
	Minimum	Nominal	Maximum	Units
Operating and storage environments:	-10	-	80	ºC
Temperature ambient:	-10	-	50	ºC
Humidity:	-	-	95	%
Altitude:	-	-	2000	m
Pollution degree:	-	-	2	
Enclosure details:	PA 66 / 6			

Protection requirements			



Dimensions:	L: 278 mm	W: 123 mm	D: 34 mm
Mass:	1,59 kg		

Motor PM requirements				
Type:	Synchronous permanent magnet			
Voltage input rating:	10			
Electrical characteristics:				
	Minimum	Nominal	Maximum	Units
Voltage Supply:	50	103	144	V
Current:	0,18	1,13	2,13	A
Power:	15	162	405	W
Torque:	0	1,5	2,5	N·m
Speed:				r.p.m
Thermal class:				
Encoder:	Magnetic Incremental ABI (channel A, channel and index).			
Resolution:	-	180	-	pulses / rev.

Motor VF requirements				
Type:	Asynchronous three-phase			
Voltage input rating:	6			
Electrical characteristics:				
	Minimum	Nominal	Maximum	Units
Voltage Supply:	200			V AC
Current:	0,58	0,82	1,53	A
Power:	90	220	440	W
Torque:	0,38	1,28	1,98	N·m
Speed:	975	900	630	r.p.m
Thermal class:				
Encoder:	-			
Resolution:	-	8	-	pulses / rev.

Wiring requirements for the female connectors				
	Minimum	Nominal	Maximum	Units
Power supply:	0,08 / 28	-	2,5 / 12	mm^2 / AWG
Inputs:	0,08 / 28	-	2,5 / 12	mm^2 / AWG
Priority inputs:	0,08 / 28	-	2,5 / 12	mm^2 / AWG
Outputs:	0,08 / 28	-	2,5 / 12	mm^2 / AWG
Motor power:	-	0,75 / 18	-	mm^2 / AWG
Motor Encoder:	-	0,14 / 26	-	mm^2 / AWG
Photocell:	0,08 / 28	-	2,5 / 12	mm^2 / AWG

Input signals	
Impedance:	20 kΩ
Voltage:	12 V DC to 60 V DC
	100 V AC to 230 V AC

Output signals				
Type:	Minimum	Nominal	Maximum	Units
Contacts:	Potential free contacts.			
Contact resistance:	-	-	100	mΩ
Operate time:	-	-	7	ms
Release time:	-	-	3	ms
Current limit:	-	-	150	mA
Voltage:	-	-	125	V AC

Performance				
	Minimum	Nominal	Maximum	Units
Opening Speed:	0,2	-	0,7	m/s
Closing Speed:	0,15	-	0,4	m/s
Safety Force:		-	150	N

Performance		
EMC:	EN 12015 : 2014	Electromagnetic compatibility. Product family standard for lifts, escalators and moving walks. Emission.
	EN 12016 : 2013	Electromagnetic compatibility. Product family standard for lifts, escalators and moving walks. Immunity.
Safety:	EN 61800-5-1:2007	Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy.

ANNEX 1

Compact and compact+ product lines

#	Model	Opening	Number of panels	PL [mm]	HL [mm]	Panel type	Fire homologation	Moving mass [Kg]
0	Compact	Side	2	800	2.000	Metal sheet	F.R. E120	29,46

#	Concept	Multiplier factor
1	Difference from T2 to C2	0,02
2	Difference of 100 mm in PL	0,03
3	Difference of 100 mm in HL	0,01
4	Difference from F.R. E120 to F.R. EI60	0,16
5	Difference from F.R. E120 to F.R. EI120	0,20
6	Difference from F.R. E120 to F.R. EW60	0,12
7	Difference from F.R. E120 to F.R. E30 Russia	0,00
8	Difference from F.R. E120 to F.R. EI60 Russia	0,16
9	Difference from F.R. E120 to F.R. EI60 Ukraine	0,16
10	Difference from Metal sheet panels to Wien type vision panels	0,28
11	Difference from Metal sheet panels to Flush big vision panels	0,23
12	Difference from Metal sheet panels to Full glass in skirting panels	0,07
13	Difference from Compact to Compact PM model	0,01
14	Difference from Compact to Compact+ PM 150 model	0,05

40/10 Product line

#	Model	Opening	Number of panels	PL [mm]	HL [mm]	Panel type	Fire homologation	Moving mass [Kg]
0	40/10	Side	2	800	2.000	Metal sheet	F.R. E120	31,61

#	Concept	Multiplier factor
1	Difference from T2 to T3	0,08
2	Difference from T2 to T4	0,26
3	Difference from T2 to C2	0,00
4	Difference from T2 to C4	0,26
5	Difference from T2 to C6	0,08
6	Difference of 100 mm in PL	0,07
7	Difference of 100 mm in HL	0,03
8	Difference from F.R. E120 to F.R. EI30	0,19
9	Difference from F.R. E120 to F.R. EI60	0,19
10	Difference from F.R. E120 to F.R. EI120	0,25
11	Difference from Metal sheet panels to Double skin panels	0,32
12	Difference from Metal sheet panels to Flush big vision panels	1,02
13	Difference from Metal sheet panels to Full glass in skirting panels	0,95
15	Difference from Metal sheet panels to Wien type vision panels	0,32
16	Difference from Metal sheet panels to Vision panels	0,61
19	Difference from 40/10 to 40/10 VF model	0,03
20	Difference from 40/10 to 40/10 PM model	0,01

50/11 Product line

#	Model	Opening	Number of panels	PL [mm]	HL [mm]	Panel type	Fire homologation	Moving mass [Kg]
0	50/11 VF	Side	2	800	2.000	Metal sheet	F.R. E120	34,49

#	Concept	Multiplier factor
1	Difference from T2 to T3	0,13
2	Difference from T2 to T4	0,36
3	Difference from T2 to C2	0,00
4	Difference from T2 to C4	0,36
5	Difference from T2 to C6	0,13
6	Difference from T2 to C8	0,36
7	Difference of 100 mm in PL	0,08
8	Difference of 100 mm in HL	0,03
9	Difference from F.R. E120 to F.R. EI30	0,18

10	Difference from F.R. E120 to F.R. EI60	0,18
11	Difference from F.R. E120 to F.R. EI120	0,24
12	Difference from Metal sheet panels to Double skin panels	0,30
13	Difference from Metal sheet panels to Flush big vision panels	0,96
14	Difference from Metal sheet panels to Full glass in skirting panels	0,89
16	Difference from Metal sheet panels to Wien type vision panels	0,30
17	Difference from Metal sheet panels to Vision panels	0,57

Premium product line

#	Model	Opening	Number of panels	PL [mm]	HL [mm]	Panel type	Fire homologation	Moving mass [Kg]
0	Premium	Side	2	800	2.000	Metal sheet	F.R. E120	40,68

#	Concept	Multiplier factor
1	Difference from T2 to T3	0,07
2	Difference from T2 to T1	-0,17
3	Difference from T2 to C2	-0,03
4	Difference from T2 to C4	0,30
5	Difference from T2 to C6	1,15
6	Difference of 100 mm in PL	0,07
7	Difference of 100 mm in HL	0,11
8	Difference from F.R. E120 to F.R. EI30	0,18
9	Difference from F.R. E120 to F.R. EI60	0,18
10	Difference from F.R. E120 to F.R. EI120	0,24
11	Difference from Metal sheet panels to Double skin panels	0,12
12	Difference from Metal sheet panels to Flush big vision panels	0,60
13	Difference from Metal sheet panels to Full glass in skirting panels	0,60
14	Difference from Metal sheet panels to Foam filled panels	-0,17
15	Difference from Premium to Premium TITAN model	0,79
16	Difference from Premium to Premium PM model	-0,10
17	Difference from Premium to Premium VF TITAN model	0,80

Platinum product line

#	Model	Opening	Number of panels	PL [mm]	HL [mm]	Panel type	Fire homologation	Moving mass [Kg]
0	Platinum PM	Side	2	800	2.000	Double skin	NO F.R. F.R. E120	56,85

#	Concept	Multiplier factor
1	Difference from T2 to C2	0,06
2	Difference of 100 mm in PL	0,08
3	Difference of 100 mm in HL	0,07

Example 1: Increment of PL and HL

Door to be calculated:						
Model	Opening	Number of panels	PL [mm]	HL [mm]	Panel type	Fire protection
50/11 VF	Side	2	900	2.100	Metal sheet	F.R. E120

Taking as basis(1):							
Model	Opening	Number of panels	PL [mm]	HL [mm]	Panel type	Fire homologation	Moving mass [Kg]
50/11 VF	Side	2	800	2.000	Metal sheet	F.R. E120	34,49

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	34,49 x 0,08(2) = 2,75 Kg	34,49 x 0,03(3) = 1,03 Kg	There are equals	There are equals	2,75 + 1,03 = 3,78 Kg	34,49 + 3,78 = 38,27 Kg

1. These specifications are in the Annex 1.
2. This factor is the increment of 100mm in PL. There is the number 7 of the second table of 50/11 VF in the Annex 1.
3. This factor is the increment of 100mm in HL. There is the number 8 of the second table of 50/11 VF 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
Premium PM	Side	1	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]
Premium PM	Side	2	800	2.000	Metal sheet	F.R. E120	36,61

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	Difference per fire homologation	SUM	Moving mass
36,61 x (-0,17) = -6,13 Kg		There are equals	There are equals	36,61 x 0,12 = 4,39 Kg	There are equals	4,39 – 6,13 = -1,74 Kg	36,61 – 1,74 = 34,87 Kg

1. These specifications are in the Annex 1.
2. This factor is the increment of 100 mm in PL. There is the number 7 of the second table of 50/11 VF in the Annex 1.
3. This factor is the increment of 100 mm in HL. There is the number 8 of the second table of 50/11 VF in the Annex 1.

Fermator
AUTOMATIC DOORS FOR LIFTS

Fermator
AUTOMATIC DOORS FOR LIFTS

Tecnolama, S.A.
Ctra. Constantí, Km 3
43204 REUS (Spain)

Here with declares that the products mentioned below conform with the following E.U. council directives:

CE

European Directive 2014/30/EU on Eelectromagnetic Compatibility (EMC) in accordance with the Product family standard for lifts, escalators and moving walks EN12015: 2014 and EN12016: 2013

VF5+ Electronic Module
(14/31708764)

Reus, 12-09-2017

David

David Román
General Manager

ATTENTION: Any type of modification not reflexed in this manual, before testing it should be notified to our Technical Department.
TECNOLAMA accepts no responsability in the event of any damage produced in the equipment described in this manual and associated installation if the instructions given have not been followed.
TECNOLAMA reserves the rights to modify the products specifications of this technical brochure without any previous advise.

(tecnolama

Tecnolama, S.A. ● Ctra. Constantí, Km 3 ● 43204 REUS (Spain) ● Tel.: +34 977 774 065
Fax: +34 977 771 615 ● www.fermator.com ● e-mail: info.es@fermator.com