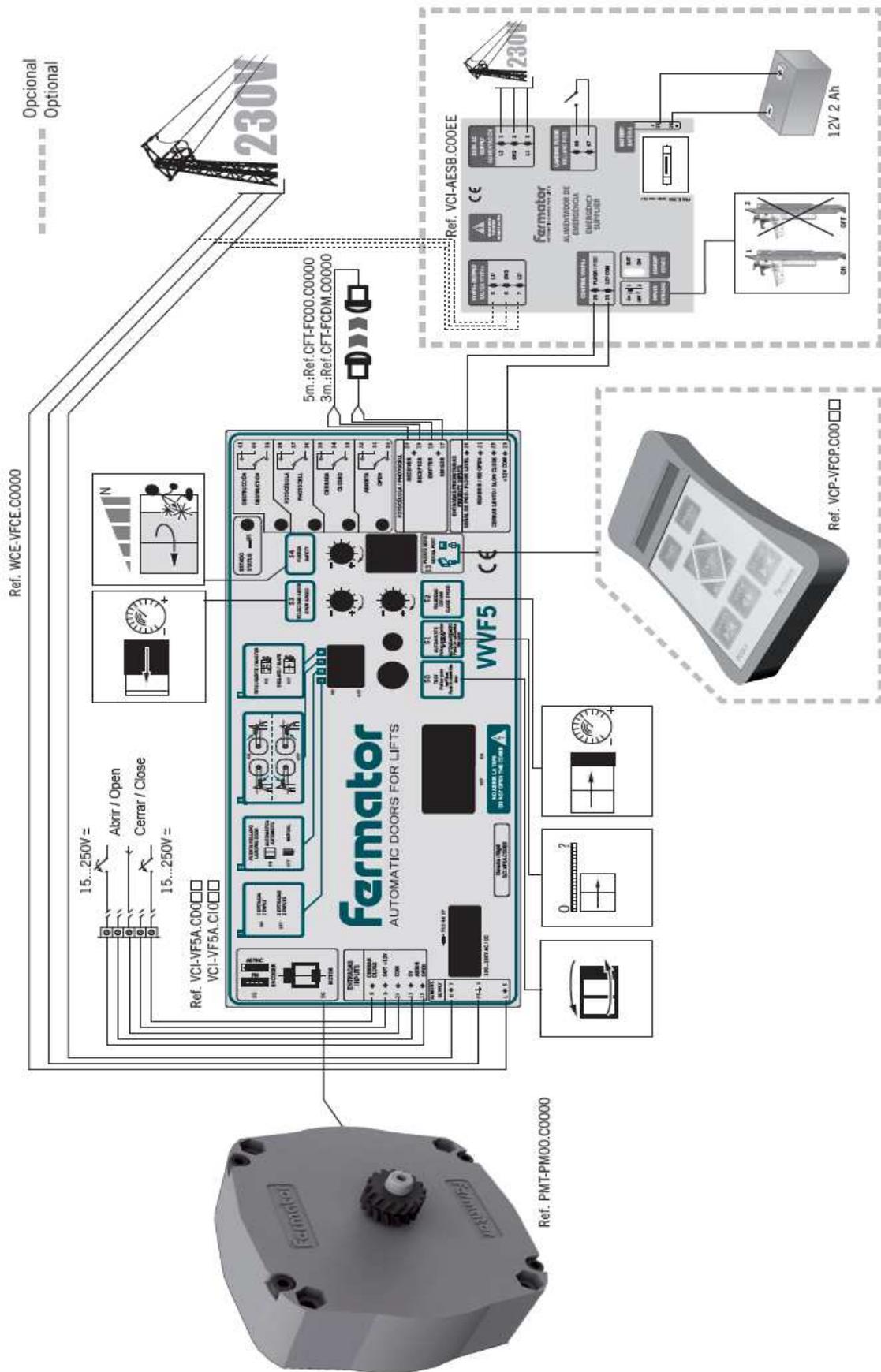


# DRIVE VVVF5

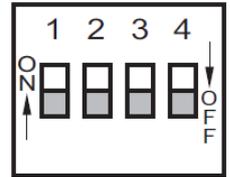


Instructions  
**DOC-TC.AS.IN.V00001.EN**  
**Connection Manual Drive VVVF5**  
 Versión / Version: 0.1



## DESCRIPTION OF SWITCHES

The unit may be programmed using the DIL switches on the front of the unit. If any change is made to any of the above switch selections, the Mains Supply to the VVVF-5 unit **MUST** be switched OFF and ON again to read the new programming. The switches functions are:



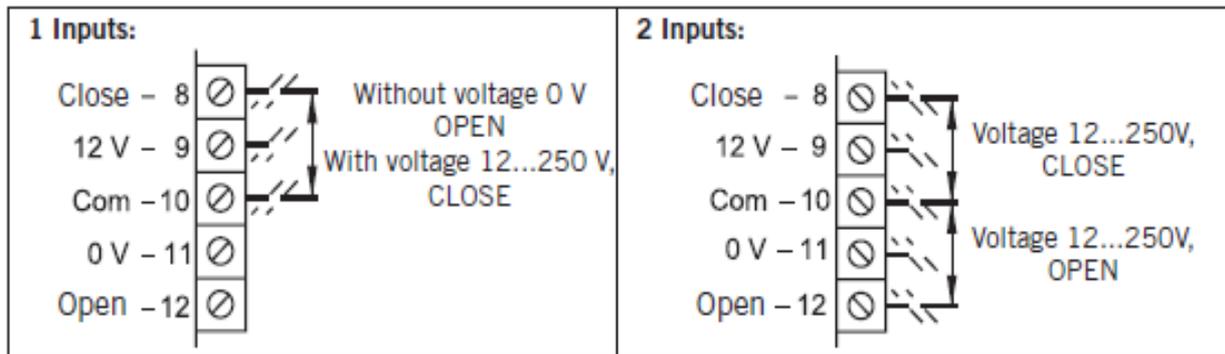
### 1.- 1 & 2 Inputs.

**ON:** 1 Input.

The door control unit will be controlled by a single input. Any voltage between 12 to 250 volts AC or DC applied between terminals 8 & 10 will close the doors. Without input active the door opens. Open input is not used.

**OFF:** 2 Inputs.

The door control module will be controlled by two independent inputs. Any voltage between 12 to 250 volts AC or DC applied between terminals 8 & 10 will cause the doors to close. And between terminals 12 & 10 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 skate (automatic landing). In this case a special movement is made for locking and unlocking the skate

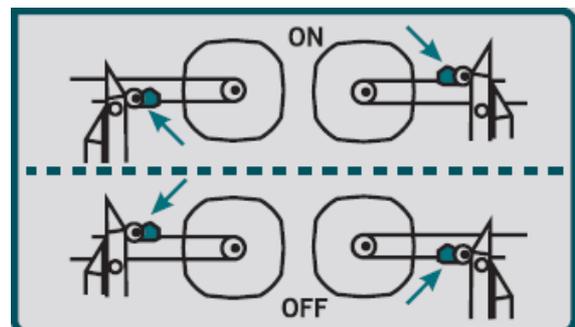
**OFF:** Semiautomatic.

Operators without skate (Semiautomatic landing door).

### 3.- Rotation sense.

**ON:** Lock at the picture:

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



**OFF:** Lock at the picture:

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

**4.- Master and Slave.**

**ON:** Master.

The door control unit will execute instructions directly. Example: operation of the Photoelectric Detector will cause the doors to re-open immediately under 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 by the inputs. Example: operation of the Safety Edge Detector will cause the door operator module to give a signal to the main lift controller via the PHOTOCCELL (36, 37, 38) output. The main lift controller

**POWER INPUTS 220-250 VOLTS SINGLE PHASE AC (5, 6, 7)**

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

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

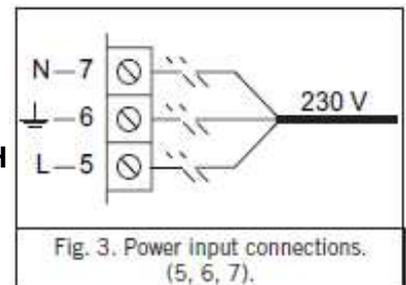
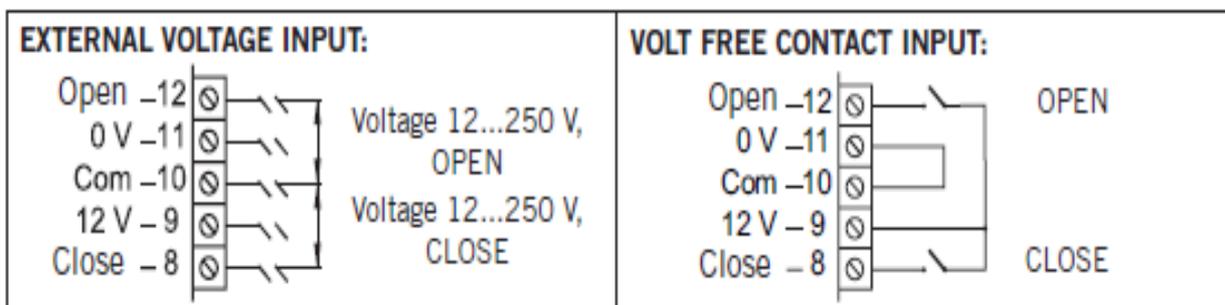


Fig. 3. Power input connections. (5, 6, 7).

**CONTROL INPUTS (8, 9, 10, 11, 12)**

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



**• 12.- Opening Signal.**

Is a signal that orders the door to open. The tension to apply could be from 12 to 250 V., with an external supply between this input and common. (10)

**• 11.- 0 Volts.**

Is the opposite pole to 12V, in the case of using internal tension should be connected by a common input.

**• 10.- Common.**

Is the reference used for the two inputs.

**• 9.- 12 Volt.**

Isolated 12 Volts 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.

**• 8.- Close signal.**

This signal is used for ordering to close the door.

**SERIAL PORT (13, 14, 15, 16)**

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.

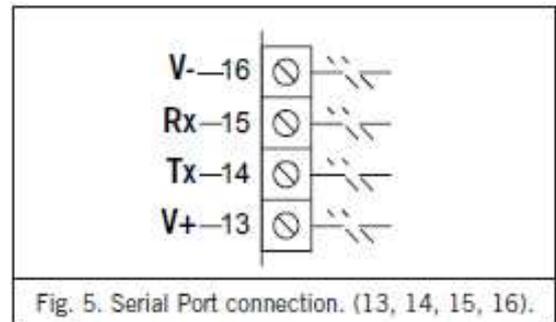


Fig. 5. Serial Port connection. (13, 14, 15, 16).

**PHOTOCELL (17, 18, 19, 20)**

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

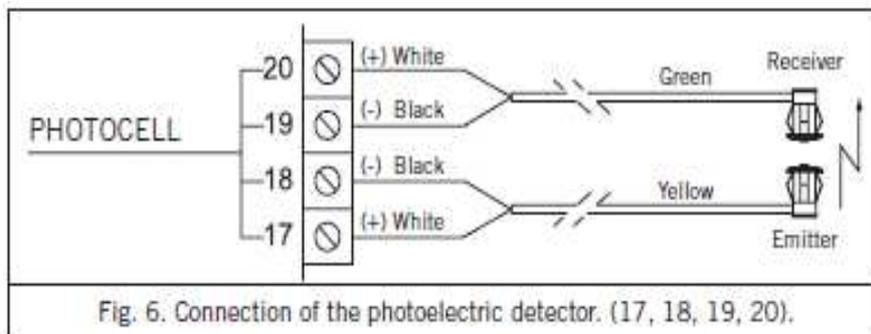


Fig. 6. Connection of the photoelectric detector. (17, 18, 19, 20).

**OTHER INPUTS (26, 21, 25, 23)**

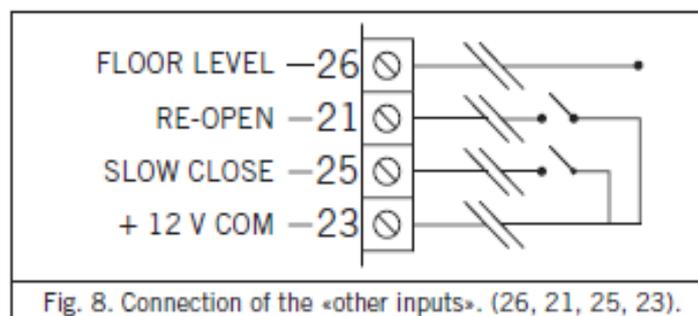


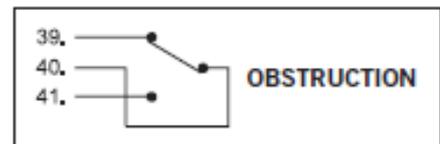
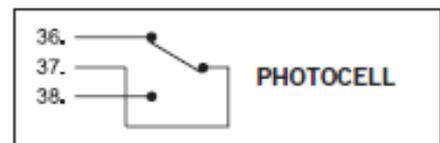
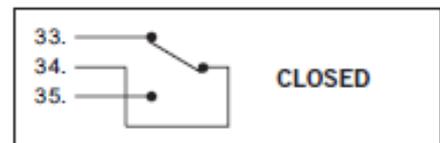
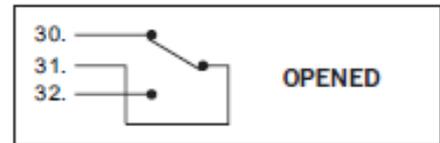
Fig. 8. Connection of the «other inputs». (26, 21, 25, 23).

- **26.- Landing signal.**  
This input is for connecting the external emergency current supplier that allows the opening manouvre in the case of power failure by a battery of 12V, able to give power during 15 seconds for a passengers rescue.
- **21.- Reopening.**  
This signal is for installing the cabin door switch or an external barrier. This signal has priority to the closing signal. Use contacts free on tension. For activating close one contact with the main supply +12V. (23).
- **25.- Slow Closing.**  
This input orders to the operator to close the door slowly regardless of the barrier and control signs. Is created for working with detection of fire centres.
- **23.- + 12 V. COM**  
This terminal is used for giving with an isolated contact a reopening order or a slow closing. Always use contacts free of tension and usually open.

### OUTPUT RELAYS AND LED INDICATORS (from 30 to 41)

Output relays have been provided to give continuous information to the main lift controller concerning the status of the doors. One 2 Amp 150 Volts volt free change over contact is provided on each relay that may be used by the main lift controller to pilot such information as «doors fully opened», «doors fully closed», «Photoelectric detedion», «obstruction in the doorway» and «door control O.K.».

- **Opened.**  
Led indicator and relay activated when the doors are fully open.
- **Closed.**  
Led indicator and relay activated when the doors are fully closed and locked.
- **Photocell.**  
Led indicator and relay activated when the photocell or the reopening input is operated.
- **Obstruction.**  
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.
- **Status.**  
Blinking led indicating proper working conditions



### TEST PUSHBUTTON (50)

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

### AUTOADJUSTMENT PUSHBUTTON (51)

The Autoadjustment pushbutton is used to set up the doors. The doors will do 5 complete movements to detect the motor and the clear opening. 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 Safety Detector are made.

#### Autoadjustment process:

- Disconnect the inputs (Pins 8,9,10,11 & 12) and the priority inputs (Pins 26,21,25 & 23).
- Switch OFF the VVVF5 and place the doors in closed position.
- Switch ON the VVVF5 and Push auto-adjustment button (51)

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

- 1<sup>st</sup> 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.).
- 2<sup>nd</sup> Movement: The door will close 150mm.

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

- 3<sup>rd</sup> Movement: The door will close completely in slow velocity until the end to detect the 0 position.
- 4<sup>th</sup> 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.
- 5<sup>th</sup> Movement: The door will close after a short delay. From the information gained the microprocessor will calculate the acceleration and deceleration ramps and the braking torque required to give the optimum control of the doors.

### **CLOSE SPEED (52)**

The door closing speed can be independently adjusted from 150 mm/s upto 40 mm/s.

### **OPEN SPEED (53)**

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

### **SAFETY (54)**

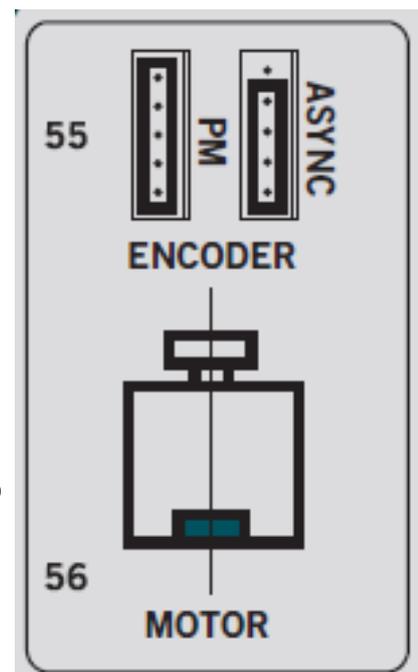
This potentiometer is used to set the closing pressure onto an obstacle in the doorway. The closing pressure can be set between 40 and 150 Nw.

### **ENCODER (55)**

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 VVVF4+**

- The VVVF5 is fully compatible with the VVVF4+, it is possible to replace a VVVF4+ for a VVVF5, but not in the other way.
- The VVVF5 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 of the VVVF4+ (4 wires).
- The VVVF4+ encoder (4 wires) has to be connected to the 4 lower pins of the encoder connector, they are marked like ASYNC.



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## **MOTOR (56)**

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

## **ON / OFF SWITCH (57)**

Disconnects the unit from the 230 Volts AC mains supply.

**Caution: When the supply is switched off, capacitors in the control system will remain charged for a short time. Allow 60 seconds before handling the Control Card or Motor.**

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