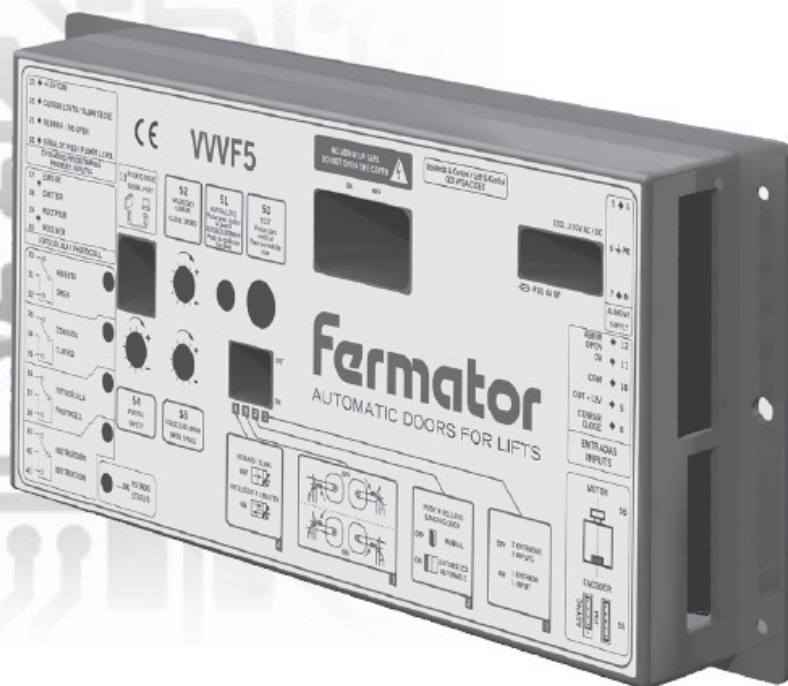


DRIVE VVVF5



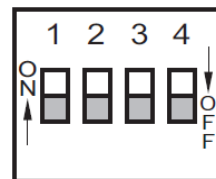
DOC-TC.AS.IN.V00001.PL

Версия / Version: 0.0



ОПИСАНИЕ ПЕРЕКЛЮЧАТЕЛЕЙ

Контроллер можно программировать с помощью переключателей DIP, которые находятся на передней стороне модуля. При введении каких либо изменений в настройках переключателей электропитание модуля VVVF5 должно быть отключенным (позиция OF), а затем включено (позиция ON) чтобы запрограммировать контроллер.



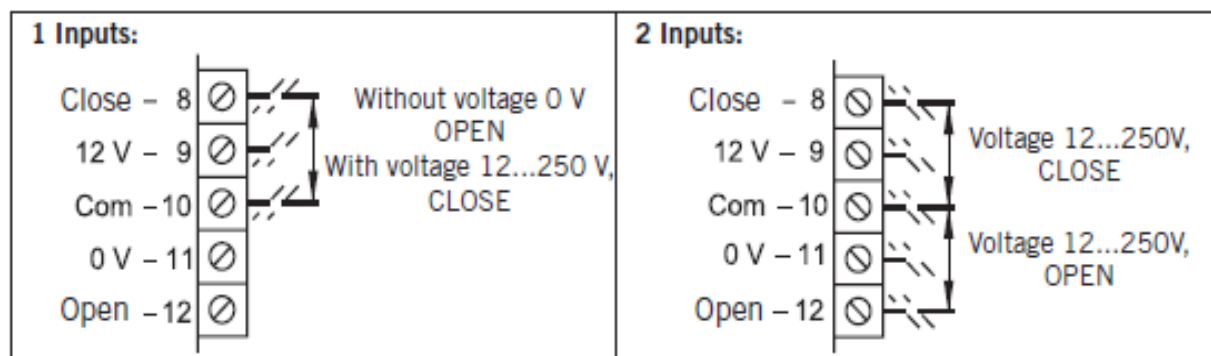
1.- 1 & 2 Входящие сигналы (Inputs).

ON: 1 Вход (Input).

Устройство управления дверьми будет контролироваться одиночным входящим сигналом. При поступлении в пункты 8 и 10 какого либо напряжение в диапазоне от 12 до 250V постоянного или переменного тока двери закроются. Без поступления напряжения двери откроются. Сигнал открытия не применяется.

OFF: 2 Вход (Input).

Устройство управления дверьми будет контролироваться с помощью двух независимых входящих сигналов. При поступлении в пункты 8 и 10 какого либо напряжение в диапазоне от 12 до 250V постоянного или переменного тока двери закроются. При поступлении напряжения в пункты 12 и 10 двери откроются. В случае не поступления сигнала двери останутся в режиме ожидания. При поступлении двух сигналов приоритет будет иметь сигнал открытия дверей.



2.- Автоматические / Полуавтоматические (Automatic / Semiautomatic).

ON: Автоматические.

Привода с отводкой (автоматические двери шахты), В этом случае происходит определенное движение чтобы закрыть или открыть отводку.

OFF: Полуавтоматические

Привода без отводок (полуавтоматические двери шахты).

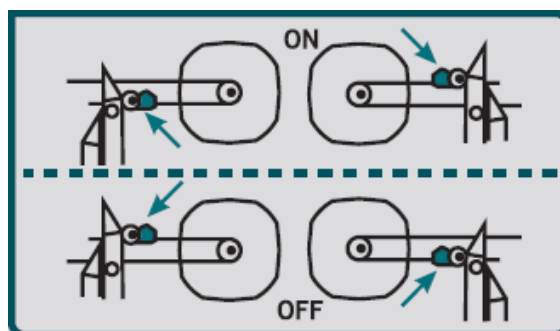
3.- Логика направления открытия (Rotation sense).

ON: Открытие замка:

- Отводка установлена на нижнем ремне, электродвигатель с правой стороны.
- Отводка установлена на верхнем ремне, электродвигатель с левой

OFF: Закрытие замка:

- Отводка установлена на верхнем ремне, электродвигатель с правой стороны.
- Отводка установлена на нижнем ремне, электродвигатель с левой стороны.



4.- Основной и Вторичный (Master i Slave)

ON: Основной.

Устройство управления будет сразу выполнять команды, например если сработает фотодатчик двери сразу откроются.

OFF: Вторичный.

Не будет использован автоматический сигнал открытия дверей. Двери откроются только в случае поступления входящего сигнала с главной станции управления лифтом, например если сработает фотозанавес контроллер вышлет сигнал к главной станции управления лифтом с помощью исходящего сигнала PHOTOCELL (36, 37, 38) и станция управления аннулирует сигнал закрытия дверей и вышлет сигнал открытия дверей.

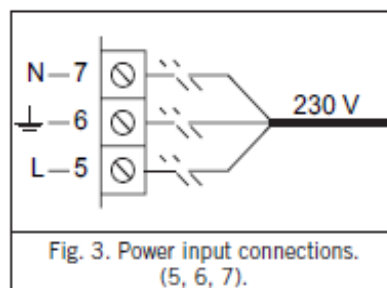
ВХОДНОЕ НАПРЯЖЕНИЕ 220-250V ОДНОФАЗНОГО ПЕРЕМЕННОГО ТОКА AC (5, 6, 7)

Электроцепь разработана для основного напряжения:

230V AC (+10%, -15%, 50 и 60 Гц).

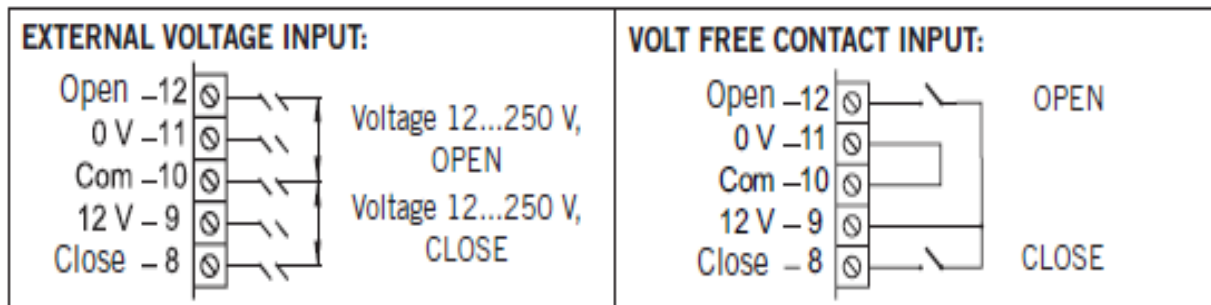
Устройство подбирает около 1A .

Немаловажным является то что Модуль Привода Дверей имеет ХОРОШЕЕ ЗАЗЕМЛЕНИЕ.



ВХОДЯЩИЕ СИГНАЛЫ УПРАВЛЕНИЯ (8, 9, 10, 11, 12)

Электрощет может работать при внутренних сигналах с напряжением как и без.



● **12.- Сигнал Открытия (Opening Signal).**

Это сигнал подающий команду открытия дверей. Можно использовать напряжение от 12 до 250V с внешним питанием между Входящим сигналом (Input) и Общим (Common). (10)

● **11.- 0 Вольт.**

Это значение противоположное к 12V, в случае использования внутреннего напряжения сигнал 11 должен быть подключен к 10.

● **10.- Общий (Common).**

Рекомендуется при использовании двух входящих сигналов.

● **9. - 12 Вольт.**

Питание 12V с сепаратором, выход доступен для контролирования дверей с помощью датчика. Требования:

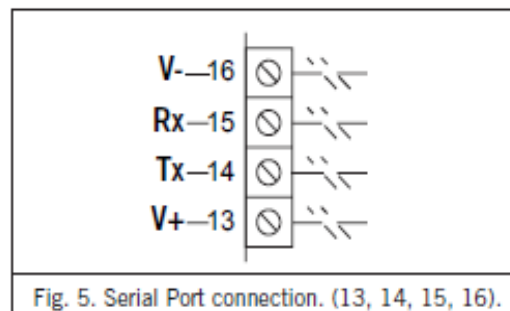
- Это питание должно быть использовано только для такого решения.
- Датчик должен быть изолированным от других источников питания.

● **8.- Сигнал Закрытия (Closing Signal).**

Это сигнал подающий команду закрытия дверей.

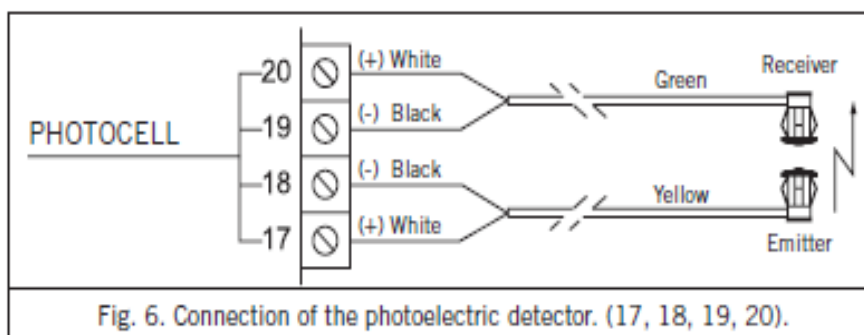
ПОСЛЕДОВАТЕЛЬНЫЙ ПОРТ (SERIAL PORT) (13, 14, 15, 16)

Этот последовательный порт используется для подключения с внешним устройством, таким как Сервис-Программатор, интерфейс и других устройств. Работа со скоростью 1.200 Бод, токовая петля.

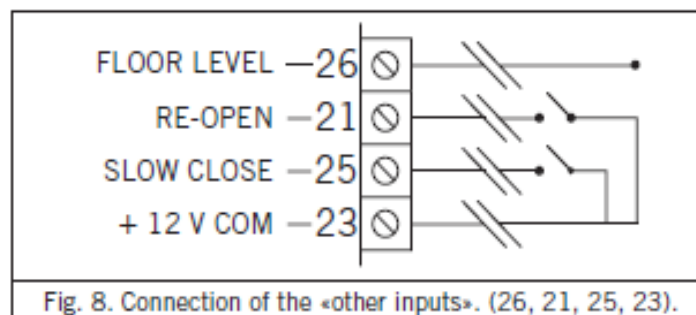


ФОТОДАТЧИК (PHOTOCELL) (17, 18, 19, 20)

Одна из наиболее важных функций это включение фотодатчика как опция. Состоит с передатчика (emitter) и приемника на инфракрасные лучи (receptor infrared).



ДРУГИЕ ВХОДЯЩИЕ СИГНАЛЫ (OTHER INPUTS) (26, 21, 25, 23)



● 26. Этажный сигнал (Landing signal).

Используется для подключения внешних источников питания, таких как аккумулятор 12V, для аварийного открытия дверей в случае отключения электропитания.

● 21. Повторное открытие (Reopening).

Этот сигнал используется для подключения передатчика дверей кабины или внешней системы безопасности. Этот сигнал имеет приоритет перед сигналом закрытия. Используйте сухие контакты для электропитания. Чтобы активировать этот сигнал закройте один датчик подавая напряжение +12V. (23).

● 23. +12V. COM

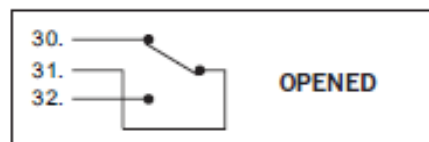
Этот терминал используется для передачи команды, для определенного датчика, повторного открытия дверей или медленного закрытия. Всегда используйте сухие контакты.

ПЕРЕДАТЧИКИ ВХОДЯЩИХ СИГНАЛОВ (OUTPUT RELAYS) И СИГНАЛЫ LED (от 30 до 41)

Передачики входящих сигналов используются для передачи информации к станции управления лифтом о статусе дверей. Для каждого передатчика используется один 2 А 150 V сухой контакт, что позволяет станции управления контролировать такую информацию как «двери полностью открыты», «двери полностью закрыты», «включение фотодатчика», «помеха в зоне закрытия дверей».

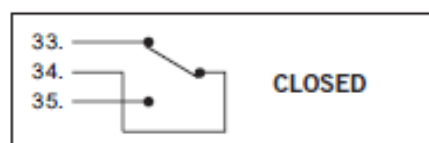
- **Открыты (Opened).**

Индикатор LED и передатчик будет активирован в моменте полного открытия дверей.



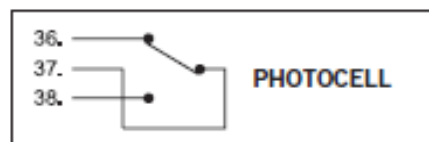
- **Закрыты (Closed).**

Индикатор LED и передатчик будет активирован в моменте полного закрытия дверей и замка.



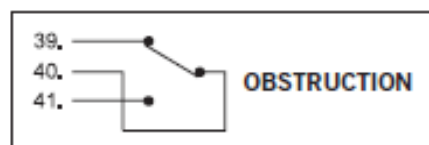
- **Фотодатчик (Photocell).**

Индикатор LED и передатчик будет активирован в моменте включения фотодатчика или поступление сигнала повторного открытия дверей.



- **Помеха (Obstruction).**

Индикатор LED и передатчик будет активирован в моменте обнаружения помехи при закрытии дверей. Сигнал будет аннулирован в моменте когда двери откроются или закроются.



- **Статус.**

Пульсирующий индикатор LED обозначает правильную работу.

КНОПКА ДИАГНОСТИКИ (TEST PUSHBUTTON) (50)

При нажатии кнопки диагностики будет произведен полный цикл открытия и закрытия дверей.

КНОПКА САМОРЕГУЛЯЦИИ (AUTOADJUSTMENT PUSHBUTTON) (51)

Кнопка саморегуляции используется для первоначальной настройки дверей. Двери произведут 5 комплектных циклов открытия и закрытия для настройки ширины открытия а также обнаружения и настройки электродвигателя. После окончания цикла саморегуляции данные будут записаны в неизменной памяти EEPROM и будут использоваться для оптимальной работы дверей. В моменте первого цикла, после отключения питания от контроллера, двери будут медленно открываться. Процесс саморегуляции должен использоваться только при первоначальной настройке или при введении изменений, таких как подключение или отключение Датчика Безопасности Fermator (Fermator Safety Detector).

Процесс Авторегуляции (Autoajustment):

- Отключить (соединения 8, 9, 10, 11 и 12) и приоритетные соединения (26, 21, 25 и 23).
- Выключить контроллер VVVF5 и переместить двери в закрытую позицию.
- Включить контроллер VVVF5 и нажать кнопку саморегуляции (51)

Первые два цикла служат для определения какого типа электродвигатель установлен.

- Первый цикл: Двери откроются на 200 мм (Если двери в моменте открытия ударяют в раму правдоподобно двери закрываются и направление открытия дверей противоположное. Измените позицию 3 переключателя DIP.)
- Второй цикл: Двери закроются на 150 мм.

Следующие 3 цикла служат для определения ширины открытия, третий цикл начинается 2 или 3 секунды после окончания второго.

- Третий цикл: Двери полностью закроются для определения нулевой позиции
- Четвертый цикл: Двери медленно откроются, просчитывая импульсы с энкодера установленного в электродвигателе до полной остановки для определения конечной позиции.
- Пятый цикл: Двери закроются после небольшого перерыва. Из собранной информации процессор рассчитает ускорение и торможение для оптимальной работы дверей.

СКОРОСТЬ ЗАКРЫТИЯ (CLOSE SPEED) (52)

Скорость закрытия можно независимо регулировать в диапазоне от 150 мм/с до 600 мм/с.

СКОРОСТЬ ОТКРЫТИЯ (OPEN SPEED) (53)

Скорость открытия можно независимо регулировать в диапазоне от 200 мм/с до 1.000 мм/с.

БЕЗОПАСНОСТЬ (SAFETY) (54)

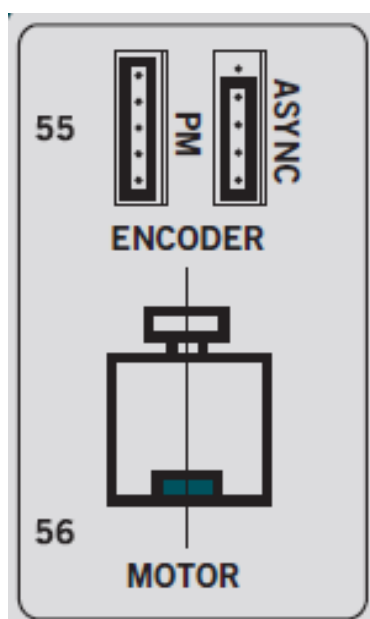
Этот потенциометр используется для настройки силы закрытия в случае появления помехи в зоне закрытия дверей. Силу закрытия можно регулировать в диапазоне от 40 до 150 Nm.

ЭНКОДЕР (ENCODER) (55)

В место этого соединения подключается интегрированный с двигателем энкодер. Энкодер высылает точную информацию контроллеру о местонахождении и скорости дверей.

СОВМЕСТИМОСТЬ С VVVF4+

- VVVF5 полностью совместим с VVVF4+, можно использовать VVVF5 вместо VVVF4+, но не наоборот.
- Соединитель энкодера VVVF5 приспособлен для подключения высокой четкости энкодера для синхронного электродвигателя PM (5 проводов) и стандартного энкодера для асинхронного электродвигателя VVVF4+ (4 провода).
- Энкодер VVVF4+ (4 провода) должен быть подключен к соединению обозначенного ASYNC.

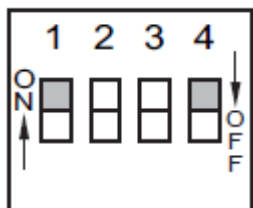
**ЭЛЕКТРОДВИГАТЕЛЬ (MOTOR) (56)**

Исходящие параметры с 3 фазного двигателя, для определения скорости, частоты и напряжения.

ПЕРЕКЛЮЧАТЕЛЬ ВКЛ./ВЫКЛ. (ON / OFF SWITCH) (57)

Отключает контроллер от электропитания 230V AC.

Внимание: После отключения электропитания конденсаторы в устройстве управления остаются заряженными еще некоторое время. Подождите около 60 секунд прежде чем дотронетесь к плате или двигателю.

MASTER: 1 Сигнал**ПРИМЕРЫ ПРОГРАМИРОВАНИЯ****• Конфигурация**

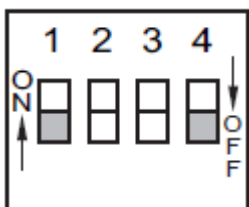
1. ON: 1 Сигнал
2. В зависимости от типа дверей
3. В зависимости от типа дверей
4. ON: Основной (Master)

Соединения

1. (8) Закрытие. Закрытие дверей при напряжении между 8 и 10. Открытие дверей, когда напряжение между 8 и 10 отсутствует.
2. (17...20) Фотодатчик. Повторное открытие дверей при обнаружении помехи.
3. (21-23) Повторное открытие. Двери не закроются при активном сигнале.
4. Помеха. Двери откроются еще раз при обнаружении помехи (остановка двигателя).
5. (25-23) Медленное закрытие. Закрытие в зависимости от состояния фотодатчика.

Приоритет

1. (21-23) Повторное открытие.
2. Помеха.
3. (25-23) Медленное закрытие.
4. (17...20) Фотодатчик
5. (8) Закрытие.

SLAVE: 2 Сигналы**• Конфигурация**

1. OFF: 2 Сигналы
2. В зависимости от типа дверей
3. В зависимости от типа дверей
4. ON: Вторичный (Slave)

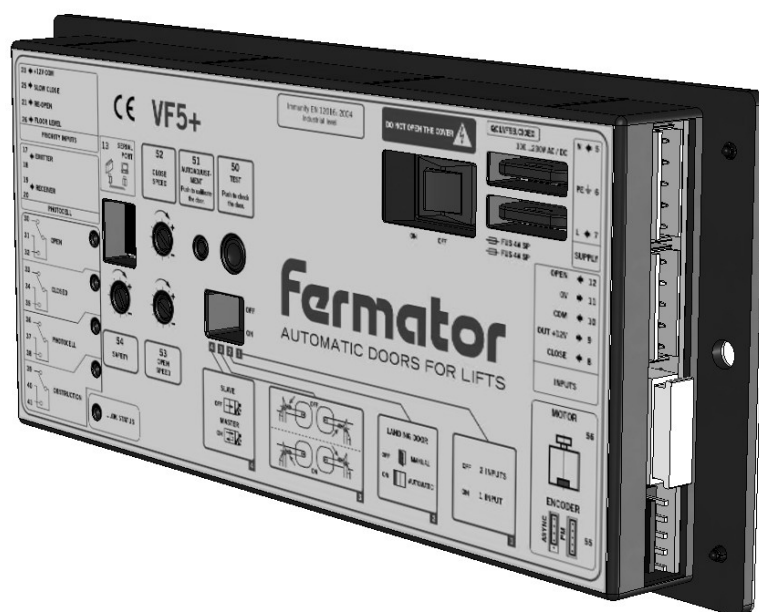
Соединения

1. (8) Закрытие. Закрытие дверей при напряжении между 8 и 10.
2. (17...20) Открытие. Открытие дверей при напряжении между 12 и 10.
3. (21-23) Фотодатчик. Двери не будут открываться при активном датчике, будет выслан сигнал к главной станции управления.
4. Повторное открытие. Двери не закроются при активном сигнале.
5. (25-23) Помеха. Двери не откроются еще раз при обнаружении помехи (остановка двигателя).
6. (25-23) Медленное закрытие. Закрытие в зависимости от состояния фотодатчика.

Приоритет

1. (21-23) Повторное открытие.
2. Помеха.
3. (25-23) Медленное закрытие.
4. (17...20) Закрытие.

VF5+ Electronic Module



VF5+ Electronic Module

Instructions

0 List of content

1 Scope of the document.....	2
2 Modification register.....	2
3 Connection.....	3
4 Programming.....	4
5 Inputs/Outputs.....	5
6 Connection with the lift controller.....	8
7 Power failures.....	9
8 Troubleshooting.....	10
9 Lift standard EN 81-20.....	12
10 Reference data.....	13
11 Annex 1.....	17
12 Annex 2.....	20

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

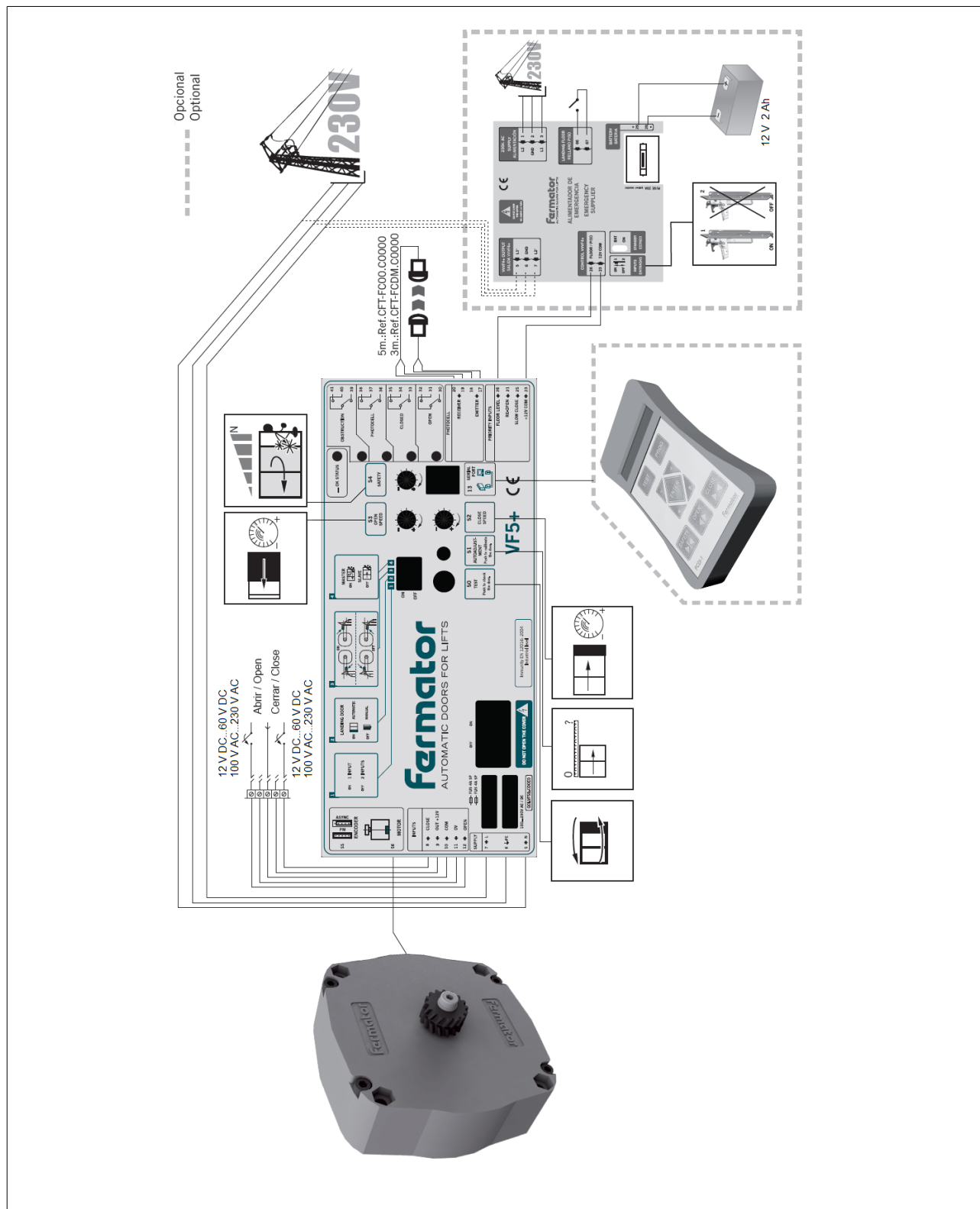
1 Scope of the document

The aim of this document is to explain the operation of the VF5+.

2 Modification register

Date	Version	Description
31/03/16	0.0	New Document.
30/06/16	0.1	Added new lift standard EN 81-20.
04/07/16	0.2	Added mechanical characteristics and assembly instructions.
24/01/17	0.3	Changed VF requirements.
26/01/17	0.4	Added new information in the overheating protection section.
02/02/17	0.5	Updated manual.

3 Connection



INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

4 Programming

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:

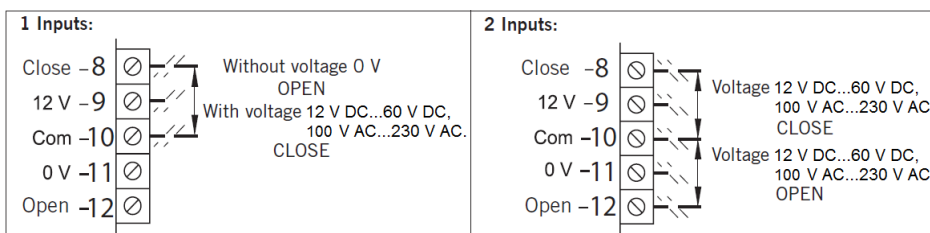
SW1.- 1 & 2 Inputs

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.



SW2.- Automatic / Manual

ON: Automatic.

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

OFF: Manual.

Operators without clutch (manual landing door).

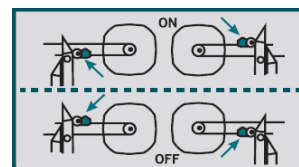
SW3.- Rotation sense

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.



SW4.- Master and Slave

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.

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

5 Inputs/Outputs

5.1 Power inputs 230 Volts single phase AC (5, 6, 7)

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.

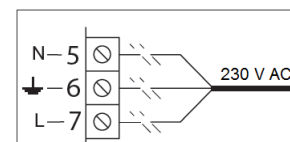
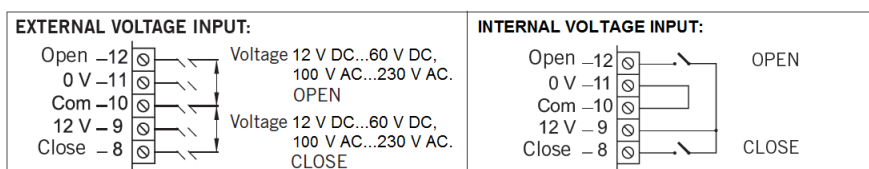


Fig. 3. Power input connections.
(5, 6, 7).

5.2 Control inputs (8, 9, 10, 11, 12)

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



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).

11.- 0 Volts

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

10.- Common

Is the reference used for the opening and closing signal.

9.- 12 Volt

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

Features are:

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

8.- Close signal

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 300N (point 5.3.15.1 of EN 81-20).

5.3 Serial port (13)

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).

5.4 Photocell (17, 18, 19, 20)

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.

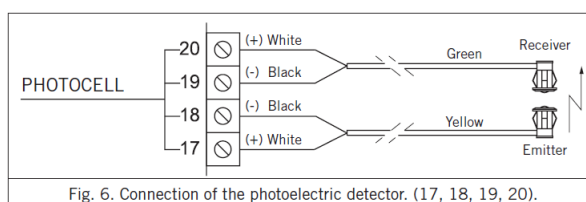


Fig. 6. Connection of the photoelectric detector. (17, 18, 19, 20).

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

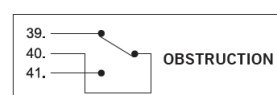
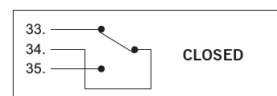
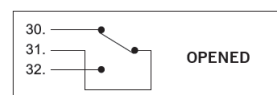
5.5 Other inputs (26, 21, 25, 23)

- 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.
- 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.
- 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.
- 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.

5.6 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. 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.».

- **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



5.7 Test push-button (50)

Operation of the TEST push-button will cause a door open or close cycle.

5.8 Autoadjustment push-button (51)

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 150mm.

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

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.

5.9 Close speed (52)

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

5.10 Open speed (53)

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

5.11 Safety (54)

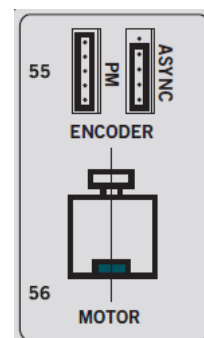
This potentiometer is used to set the closing pressure onto an obstacle in the clear opening. The closing pressure can be set between 60 and 150 Nm.

5.12 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 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.



5.13 Motor (56)

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

5.14 On / Off Switch (57)

Disconnects the unit from the 230 V AC mains supply.

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

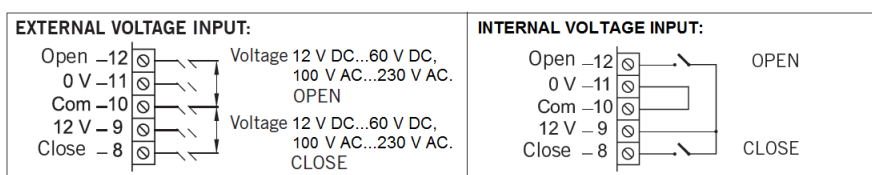
6 Connection with the lift controller

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.

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

7 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.

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

8 Troubleshooting

8.1 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.

8.2 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.

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

- **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.

8.3 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.

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

9 Lift standard EN 81-20

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

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).

9.1 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 150N" 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.

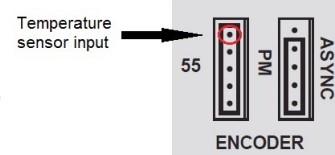
9.2 Light curtain

- 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+.

ENTRADAS PRIORITARIAS PRIORITY INPUTS	
SEÑAL DE PISO / FLOOR LEVEL	26
REABRIR / RE-OPEN	21
CERRAR LENTO / SLOW CLOSE	25
+12 V COM	23

9.3 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.



9.4 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.

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

10 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	
1. 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.				

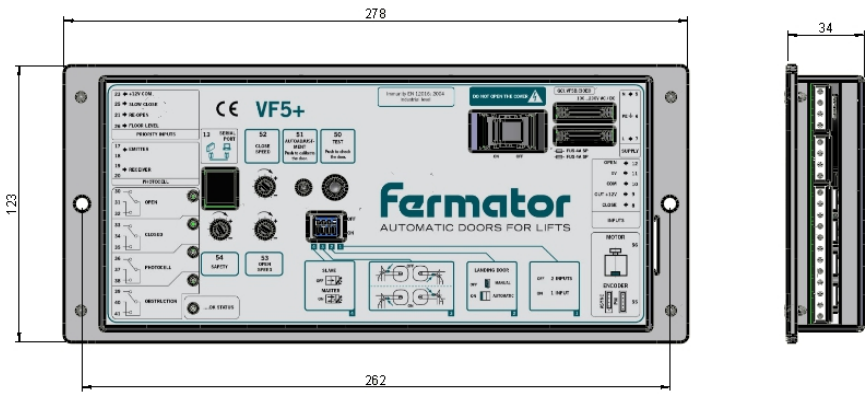
Environmental characteristics				
	Minimum	Nominal	Maximum	Units
Operating and storage environments	-10	-	80	°C
Temperature ambient	-10	-	50	°C
Humidity	-	-	95	%
Altitude	-	-	2000	m
Pollution degree	-	-	2	
Enclosure details	PA 66 / 6			

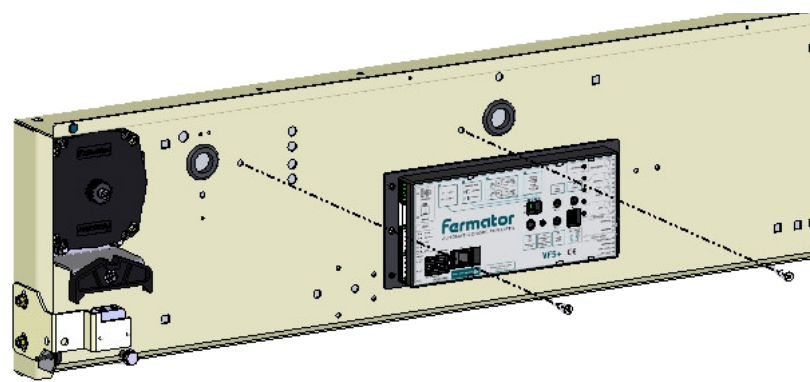
INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

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

Assembly instructions	
	

Motor PM requirements				
Type	Synchronous permanent magnet			
Number of poles	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	600			r.p.m.
Thermal class				
Encoder	Magnetic Incremental ABI (channel A, channel and index).			
Resolution	-	180	-	pulses / rev.

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

Motor VF requirements				
Type	Asynchronous three-phase			
Number of poles	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				
	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	60	-	150	N

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

Reference to standards		
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.

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

11 Annex 1

11.1 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. E 120	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. E 120 to F.R. EI 60	0,16
5	Difference from F.R. E 120 to F.R. EI 120	0,20
6	Difference from F.R. E 120 to F.R. EW 60	0,12
7	Difference from F.R. E 120 to F.R. E 30 Russia	0,00
8	Difference from F.R. E 120 to F.R. EI 60 Russia	0,16
9	Difference from F.R. E 120 to F.R. EI 60 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

11.2 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. E 120	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. E 120 to F.R. EI 30	0,19
9	Difference from F.R. E 120 to F.R. EI 60	0,19
10	Difference from F.R. E 120 to F.R. EI 120	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

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

11.3 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. E 120	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. E 120 to F.R. EI 30	0,18
10	Difference from F.R. E 120 to F.R. EI 60	0,18
11	Difference from F.R. E 120 to F.R. EI 120	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

11.4 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. E 120	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. E 120 to F.R. EI 30	0,18
9	Difference from F.R. E 120 to F.R. EI 60	0,18
10	Difference from F.R. E 120 to F.R. EI 120	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

INSTRUCTIONS

DOC-FE.IE.IN.016172.EN

VF5+ Electronic Module

Version: 0.5

11.5 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	2000	Double skin	NO F.R. F.R. E 120	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

INSTRUCTIONS
DOC-FE.IE.IN.016172.EN
VF5+ Electronic Module

Version: 0.5

12 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
50/11 VF	Side	2	900	2.100	Metal sheet	F.R. E 120

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. E 120	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	$34,49 \times 0,08^{(2)} = 2,75 \text{ Kg}$	$34,49 \times 0,03^{(3)} = 1,03 \text{ Kg}$	There are equals	There are equals	$2,75 + 1,03 = 3,78 \text{ Kg}$	$34,49 + 3,78 = 38,27 \text{ Kg}$

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. E 120

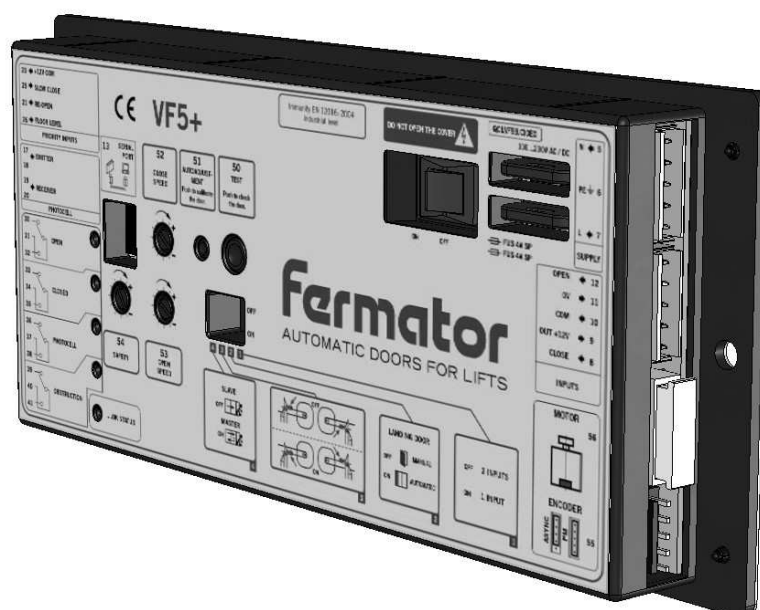
Taking as basis ⁽¹⁾ :							
Model	Opening	Number of panels	PL [mm]	HL [mm]	Panel type	Fire homologation	Moving mass [Kg]
Premium PM	Side	2	800	2.000	Metal Sheet	F.R. E 120	36,61

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 ⁽³⁾	Difference per fire homologation	SUM	Moving mass
$36,61 \times (-0,17) = -6,13 \text{ Kg}$	There are equals	There are equals	$36,61 \times 0,12 = 4,39 \text{ Kg}$	There are equals	There are equals	$4,39 - 6,13 = -1,74 \text{ Kg}$	$36,61 - 1,74 = 34,87 \text{ Kg}$

1. These specifications are in the Annex 1.
2. This factor is the difference between T2 (side 2 panels) to T1 (side 1 panel). There is the number 2 of the second table of Premium PM in the Annex 1.
3. This factor is the difference between metal sheet panel and double skin panel. There is the number 11 of the second table of Premium PM in the Annex 1.

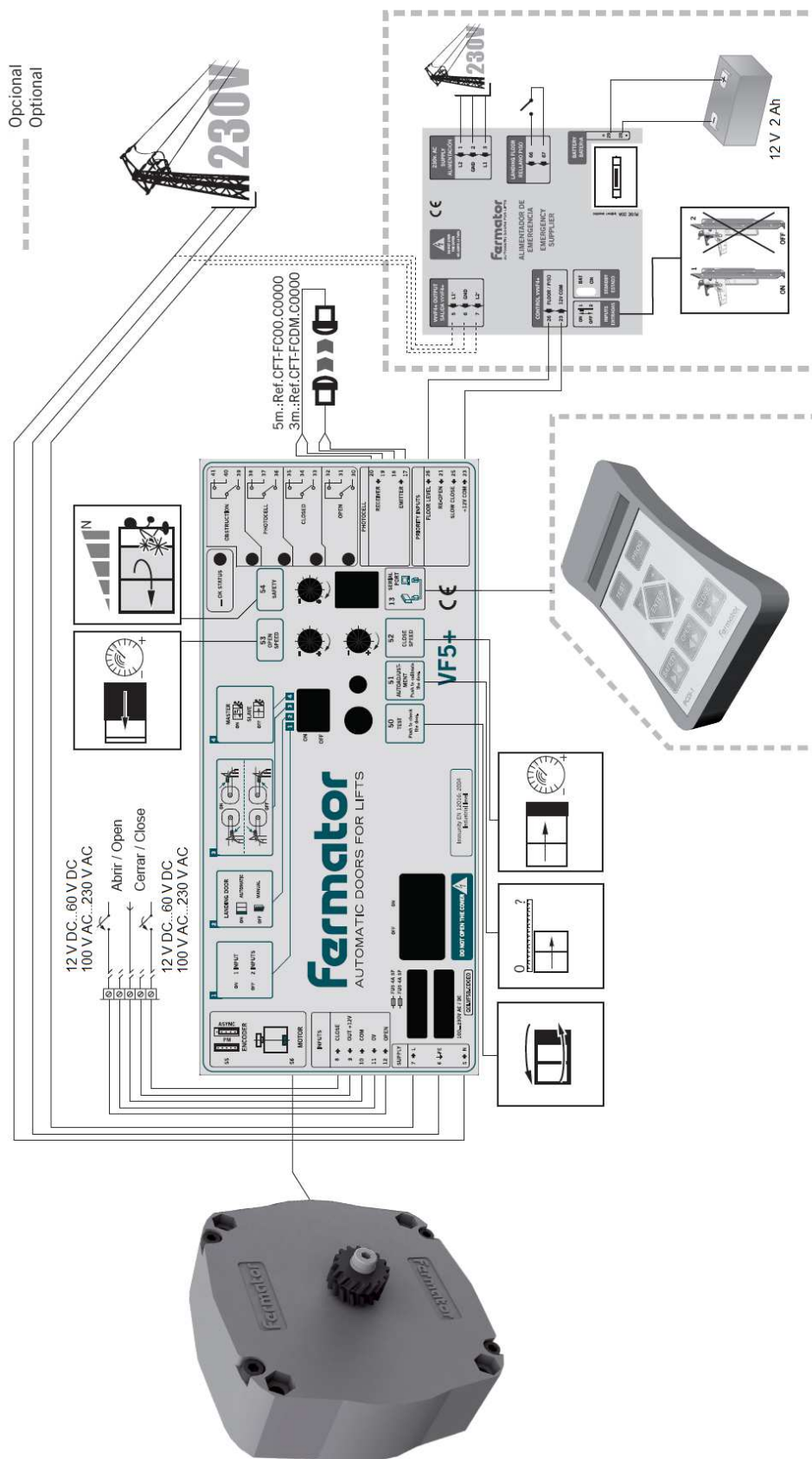
VF5+

操作指导书



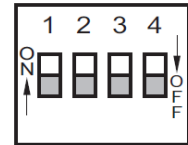
索引

- 连线图.....3
- 参数设置.....4
- 输入端口.....5
- 自学习过程中的故障排查.....9
- 电梯控制的正常调节.....10
- 电源故障.....11
- 电眼测试.....12
- 故障排查.....13
- 参考数据.....14
- 符合性声明.....16



参数设置

VF 门机控制器可通过面板上的拨码开关进行参数设置。如果改变了开关的位置设置，需要重启VF5控制器，以便读取新的开关参数设置。拨码开关的功能如下：



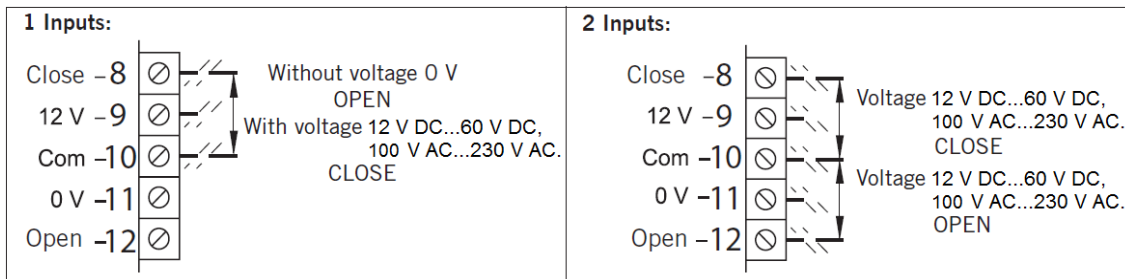
1.- 1 & 2 输入.

ON: 单信号输入.

开关位于On位置,此时由单一关门信号控制.任何加在端口8和10之间12-6VDC或者100V~230VAC电压均会使门关闭.去除这一信号,门将打开.在门关闭动作过程中,开门信号不起作用。

OFF: 双信号输入.

开关置于OFF处,此时开关门有两个独立信号输入控制.当8 & 10 端口输入一个介于12~60VDC或100V~230VAC之间的电压时, 门将关闭。当10 & 12端口输入以上条件电压时, 门将打开。如果没有电压, 门将保持静止。如果同时输入开关门电压, 开门优先。



2.- 自动/半自动设置

ON: 自动模式.

带门刀的装置（自动厅门）。在这种模式下有一个特殊的收刀和松刀的动作。

OFF: 半自动模式.

不带门刀的装置（半自动厅门）。

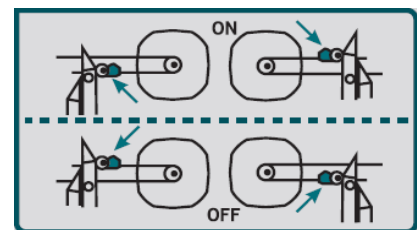
3.- 旋转方向.

ON: 如图所示:

- 1.门刀安装在皮带的底部, 马达装在右边。
- 门刀安装皮带上部, 马达安装在左边。

OFF: 如图所示:

- 门刀安装在皮带的上部, 马达安装在右边。
- 门刀安装在皮带的下部, 马达安装在左边。



4.- 主动和从动.

ON: 主状态:

门机控制器自动控制。例如：在门机控制器的控制下，光电探测器会使门重新打开。

OFF: 从动状态:

这里没有自动重开门的动作。门机控制器只接受电梯主系统的控制信号输入。例如：安全检测装置会使门机通过电眼指示端口（36.37.38）向电梯主控系统发送一个安全指令，然后电梯主控系统会随之撤消关门信号，重新发送一个开门信号给门机控制器。

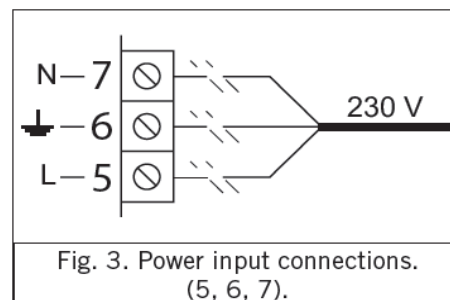
输入：

电源输入端口（5，6，7）：AC220-250V，单项交流电。

控制器设计规格：工作电压：AC230V（+10%,-15%,50或者60Hz），
工作电流：1A

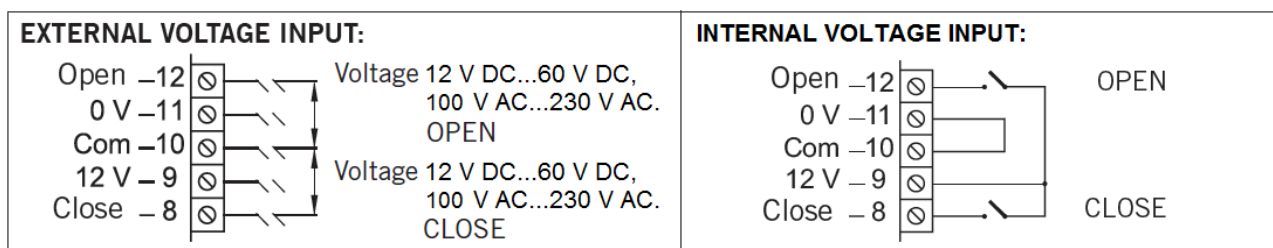
控制器的接地非常重要。

VF5+控制器中的软启动系统用来控制大容量电容的电荷并防止短路。
控制器的设计通过了EN12016:2004标准的抗扰性测试。



控制信号输入端口（8，9，10，11,12）

控制器可以由外部电压控制,也可由内部电压控制.



12.- 开门信号

提供一个使门打开的信号。控制电压范围：12-60VDC，100V~230VAC，加在输入端口与公共端口（10）之间。

11.- 0V端口

与12V极性相反，在使用内部电源时此端口应与公共端口短接。

10.- 公共端

作为输入端口的参考电位。

9.- 12V端口

在没有外部控制电源输入时，内部独立的12V电源输出用来控制开关门。特征如下：

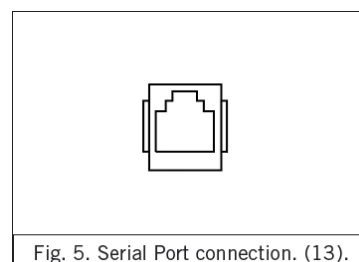
- a) 只能用来控制开关门。
- b) 必须与任何供电电源隔离。

8.- 关门信号端口

提供一个使门关闭的信号。

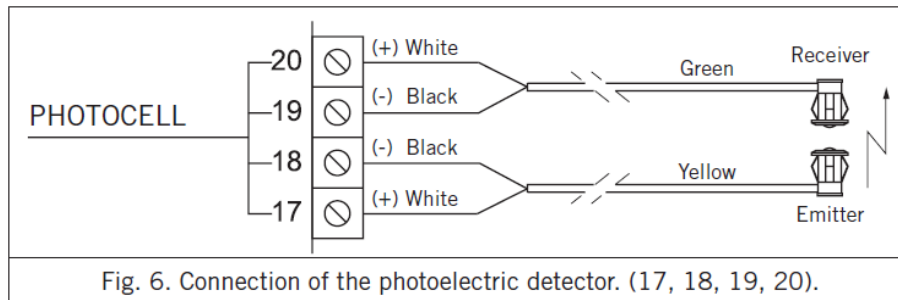
串行端口(13)

串行端口用于连接扩展设备,例如调试器,计算机以及未来的扩充设备等.传输速率1200Bps，电流环路.使用电话线接口(RJ11)连接

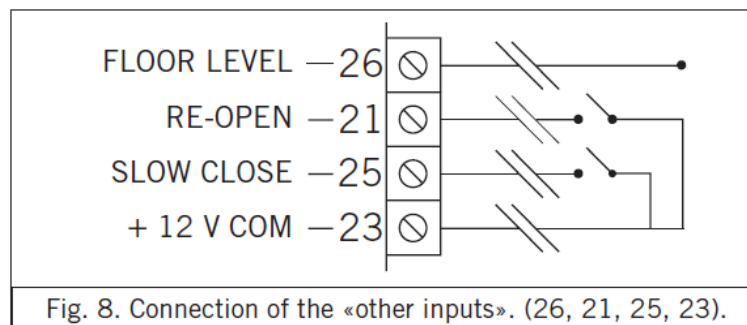


PHOTOCELL (17, 18, 19, 20)

最主要的特征就是一个光电收发器件组合。包含一个红外发射模块，一个红外接收模块。



其他输入端口 (26.21.25.23)



26.- 平层信号

该输入端口用于外部紧急备用电源输入。当控制器断电时，12V的备用电池会提供15秒的开门动作，用于乘客的紧急救援。

21.- 重开们信号

这个信号是控制轿门开关门切换或者处理碰到障碍物状态的。使用时，短接（21）和（23）端口。不需要外接电压。开门信号优先与关门信号。

25.- 慢关门信号

这个信号用于使门慢速关闭。这个慢关门信号优先与控制端的输入信号和电眼反馈信号。此设计用于火灾检测控制。

23.- +12V公共端

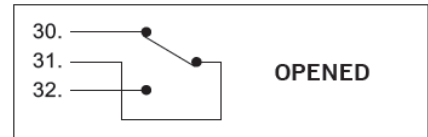
这个端子用于提供相互独立的重开门和慢关门的电压信号。处于常开状态

输出继电器和LED信号指示端口（30~41）

输出继电器连续地向电梯主控制器提供门动作状态的各种信息。继电器的输出被用来向电梯主控系统传送以下信息：《门全部打开》,《门全部关闭》,《电眼检测》,《运行障碍》,《正常状态》。

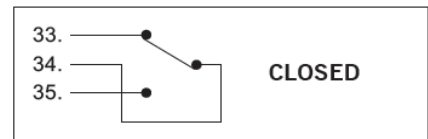
- **开门到位指示.**

门完全打开，继电器动作，LED指示灯亮。



- **关门到位指示.**

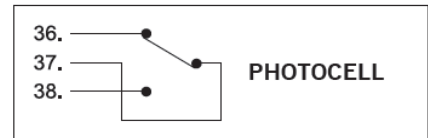
门完全关闭，继电器动作，LED指示灯亮。



- **电眼指示.**

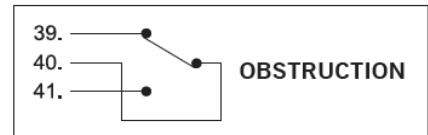
当门重开有信号输入或者电眼开始工作时，继电器动作，LED指示灯亮

备注: 在USA版本中，电眼指示灯同样是障碍指示。



- **障碍指示.**

当关门过程中遇到障碍物时，继电器动作，LED指示灯亮。当门完全打开或者完全关闭时，此信号消失。



- **Status.状态指示**

LED指示灯闪烁表示工作状态正常。

测试按钮（50）

按下测试按钮可以进行一个开门或关门动作。

备注: 在USA版本中，测试按钮必须一直按压直到整个关门或者开门行程顺利完成。假如没有完成，测试中按测试按钮门将不能完成整个开关门动作。

AUTOADJUSTMENT PUSHBUTTON (51)

自学习按钮用于初始化门机控制器。自学习时，门机控制器通过5个动作来检测马达的种类以及开门宽度。通过收集到的数据，微处理器会计算出最合适的加减速速度控制曲线以及制动转矩。一旦自学习完成，参数将被写入EEPROM储存器中，然后用以计算出最优化的控制参数。断电后重新通电，门机控制器第一次运行会慢慢打开。只有在控制器初始化或者做出参数修改时，和连接或者移除FERMATOR安全探测装置时才会重新自学习。

自学习过程:

- 断开输入信号（脚8, 9, 10, 11, & 12），还有优先输入信号（脚 26,21,25 & 23）
- 关闭VVVF5控制器的电源 开关，然后将电梯门处于关闭位置。
- 打开VVVF5控制器电源开关，然后按自学习按钮（51）。

接下来的二次动作，用于检测安装的马达种类。

- 第一步动作：门会打开200mm(假如门只是抖动了一下而不是打开的动作，意味着门试图关上但是方向是相反的。那么必须改变第三个拨码开关的状态。)
- 第二步动作：门将会关闭150mm。

之后的3个动作（3, 4, 5）是检测门的净开门宽度的，其中的第三个动作，在完成第2个动作2到3秒后才开始。

- 第3步动作：门会以一个很慢的速度完全关闭，检测显示位置为"0"
- 第4步动作：门会慢慢的打开，直至碰到开门限位装置，期间控制器会计算来自马达内部的编码器的脉冲数，从而确定门的最终位置。
- 第5步动作：门在等待片刻后会关闭。微处理器会通过收集的信息，计算出控制门运动时的最合适的加减速速度控制曲线，以及所需的制动力矩。

关门速度(52)

关门速度可以从150mm/s至400mm/s进行独立调节。

开门速度(53)

开门速度可以从 200 mm/s 至700 mm/s进行独立调节。

安全力 (54)

这个电位器设定关门时重开门的阻力的大小。60至150Nm可调。

备注: 在USA版本中，最大可调是130Nm.

编码器端口(55)

一个连续的正交脉冲编码器被连接在这个输入端口。安装在电机内部的编码器的脉冲信号，提供门在控制状态下的精确位置和速度信息。

与Fermator的异步马达兼容.

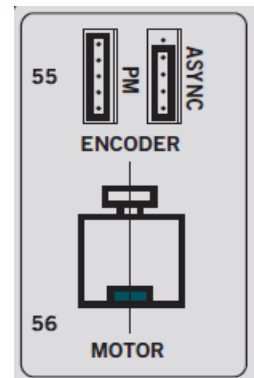
- VF5的编码器接头可用于连接永磁同步电机内部的高分辨率编码器（5线），也可连接异步电机内部的标准编码器（4线）
- 异步电机的编码器线（4芯）必须连接在如有图所示的（ASYNC）4 Pin接头上。

电机 (56)

与三项电机相连，通过改变电压和频率控制电机的速度和转矩。

开/关 (57)

控制 AC 230V 电源供电的通断。



自学习过程中故障排除

- **按下TEST 或者AUTOADJUSTMENT 按钮，没有反应。**

- 关掉电源重启控制器，重新测试。

如果还是没有反应，更换门机控制器。.

- **门没有运动。**

- 检查马达的连接线是否正确。

- 当有控制动作时（按下按钮等），检查是否有一可变电电压传送给马达。这个电压在门静止，关闭和打开时是不同的。因为在打开的状态下，需要一保持力矩维持门处于打开的状态。马达的电压只能由Fermator提供的调制器进行检测。如果电压正确而马达没有动作，那么你必须更换马达。

- **在自学习周期完成之前，门停止动作。**

检查编码器：

- 门保持开门状态→意味着开门没有到位，这是需更换编码器电缆（#55连接线）

- 门打开或者关闭≤20cm，然后静止不动 →检查编码器是否连接 或是否损坏，检查马达滑轮是否拧紧。

如果仍无法工作，建议更马达换编码器。

- **门本来应该关闭的却打开了。**

- 检查Dip拨码开关位置3的设置是否正确。

- 检查马达连接线（#56连接线）

- **门机自学习过程正确，但门刀无法合上，关门到位继电器动作。**

- 检查Dip拨码开关位置2是否正确设置。门在马达位置0处，门刀也应该合上，在关门到位的时候。

- **门在门刀活动的行程中停止。**

- 手动检查门刀的开合是否正常（参考组装手册）

- **门不能完全关闭。**

- 断开所有连接，检查受否有障碍物。

备注：需按以上方法进行正确的安装测试，并且定期检查。

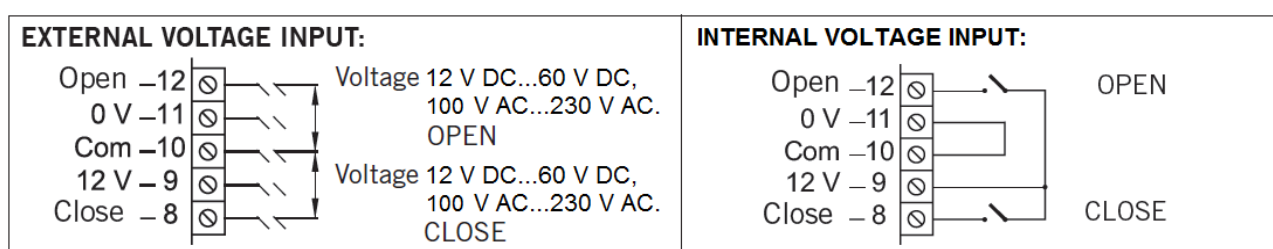
控制器的正确调试

只有门机自学习周期顺利完成，才能连接电梯系统的控制信号。同时，三个电位计才可以用与参数调节设置。

1.- 如何正确连接电梯系统的控制线。

- 连接输入信号线 (端口 8, 9, 10, 11 & 12) 和优先控制信号线 (端口 26, 21, 25 & 23).
- 连接继电眼装置(端口 17, 18, 19& 20).
- 连接继电器输出信号与电梯系统的控制线(端口 30 to 41).

关掉 VF 控制器的电源，然后连接"open"和"close"的控制线。不要混淆来自电梯的控制电压和来自门机内部的控制电压。(端口 9: 12 V 和 端口 11: 0 V).



2.- 将调节电位计调至最小值。

- 关门速度 (#52)。
- 开门速度 (#53)。
- 安全力 (#54)。

3.- 调试门系统

- 检查厅门装置是否正确。
- 按下«TEST» 按钮，并调节电位计(开门速度,关门速度，安全力)，以得到最佳的调整状态。

备注: VF控制器的参数，可以通过Fermator调制器进行设置。

电源故障

VF5+ 针对电源故障新增了两项保护系统包含两项保护系统：

- **防撞系统**

当门正在打开、关闭或完全打开时发生断电，防撞系统能够控制PM马达以低速缓慢使门关闭，以避免关门中的撞击。

- **轿门锁电子系统**

当门完全关闭时发生断电，VF5+控制器能够检测到电压的骤降且在轿门处于平层时能够打开轿门锁。这项新的安全系统需要使用在不带弹簧的轿门锁上。轿门锁电子系统能够通过软件被激活。

电眼调节测试

避免电眼电缆引入干扰噪声信号（如马达干扰，电源线噪声干扰等）

1.- 检查是否有电眼接收和发射装置（标有E 和 R的电眼装置），检查装置电缆线是否连接正确（发射端连接黄色电缆线，接收端连接绿色电缆线）。

2.- 将电眼装置连接到门机控制器。

即使你不安装电眼装置，也必须学习电眼测试方法，避免电眼指示继电器不正常工作。一旦电眼装置被门确定，那么之后断开电眼装置，门机控制器会立即检测到。

3.- 将红外收发探头对齐，分别安装于左右门上，并留有至少 5 厘米的间隙，以确保门在自学习关门过程中不会相互撞到。安装自学习完毕，用手去监测电眼装置是否正常工作。检测方法：当门打开或者关闭过程中，用手掌挡住红外探头的光线，检测电眼信号继电器是否工作正常。。

红外电眼装置的问题排查。

• 电眼装置间歇性动作

- 检查接地端口是否正常(#6端口).
- 检查插头接线是否正确 (#17 到 #20端口).
- 断开电眼装置，使门完全开门再关门一次，然后再连接上电眼装置，重新测试。
- 确认下电眼的收发端接线是否正确（E是发射端和R是接收端），E接黄色电缆线，R接收端接绿色点篮线。
- 使电眼电缆线远离电噪声器件，如电机，电源供电线等，确保电眼电缆线没有相互短路。
- 如果有Fermator调制器，可以用调制器测试电眼信号是否正常。
- 请勿加长电眼装置的电缆线。
- 切记，在主动模式下，系统在完成一个完整的自学习周期后，会自动识别电眼控制信号。

故障处理

- **门只是关闭35 cm.**

- 这个是控制器默认的开门宽度(在没有做任何自学习之前)。因此，需要做自学习动作(参照自学习指导步骤)

- **门可以打开，但是不能关闭。**

- 检查电眼指示灯是否工作。如果在工作，检查电眼信号是否被隔断，或者«OPEN»端口有信号输入。
- 用万用表或Fermator调试器检查关门信号端口(#12)是否正常。如果关门信号正常，门依然不能关闭，那么请更换新的VF控制器。
- 检查重开门信号端口(#21)是否有信号输入。
- 检查开门信号是否存在干扰电压。

- **门自己重新打开**

- 检查重开门保持力电位器的调节情况(#54)
- 检查电眼装置有无动作。
- 检查并确保门系统没有机械上的阻碍。
- 如果还有同样的问题存在，断开电眼装置，重新按压测试按钮，如果门还是不能完全打开或者关闭，那必然有障碍物阻挡门正常运行。

- **门不能抵达完全打开的位置**

- 检查门的自学习是否完全。正常情况下，只要开门宽度不超过1400mm, 门机马达拥有足够的力矩将门打开。

- **在关闭门刀的时候门重新打开**

- 检查门刀的组装方法，很有可能门刀组装错误导致存在机械摩擦。检查障碍指示灯是否亮起。

- **门在打开的过程中存在撞击现象。**

- 检查门刀在门打开之前，就是仅当门刀完全打开时，门刀是否固定完好。如果门刀没有完全固定好，需要调整门刀，不然门刀很难正常打开。

- **当门到达完全打开的位置没有停止，关门到位灯没有亮起，然后系统故障报错。**

- 检查皮带的松紧度，因为故障产生的原因可能是皮带打滑，然后编码器输送了出错的信号。调节好皮带的松紧程度，然后重新自学习。
- 门通电正常，但是门机系统不工作，电源指示灯不亮
- 检查两根外部保险丝是否完好，如果烧毁，请更换保险丝(Fermator指定型号 250V，4A)

- **马达间歇性动作**

- 检查马达连接线是否正常，或者检查是否有缺相。
- 检查滑轮和编码器是否组装正确。

- **电源指示灯正常，但门机不遵从控制信号工作**

- 这里肯定在门打开的时候存在障碍物，所以门机进入15秒的无指令状态。
- 在从动状态的设置下，存在一个持续的障碍，但是电梯主控制系统依然输出的是给门机关门的指令而不是开门指令
- 应该存在马达短路的现象。门机会进入时长3秒的自我检测程序。

Instructions

DOC-FE.IE.IN.xxxxxx.EN

VF5+控制器操作指导书

Version: 0.0

REFERENCE DATA 参考数据

供电电源:

⤴ AC电压范围:	230 V AC +10%, -15%.
⤴ 工作频率:	50...60 Hz.
⤴ 待机功耗:	50 mA 4 W.
⤴ 额定功率(PM马达):	0,21 A 20 W.
⤴ 最大峰值功率:	1,31 A 170 W.

变频参数:

⤴ 载波频率:	16 KHz.
⤴ 频率范围:	0,5...100 Hz.
⤴ 电压范围:	40...200 V AC III.
⤴ 最大输出电流:	4 A.
⤴ 位置控制:	正交编码器.

PM马达:

⤴ 永磁同步:	10 pole.
⤴ 额定电压:	88 V.
⤴ 额定功率:	63 W.
⤴ 额定扭矩:	1 N·m.
⤴ 额定转速:	600 RPM.
⤴ 绝缘等级:	F-155°C.

VF马达:

⤴ A三相异步电机:	6 pole.
⤴ 额定电压:	230 V.
⤴ 额定功率:	250 W.
⤴ 额定扭矩:	1,5 N·m.
⤴ 额定转速:	900 RPM.
⤴ 绝缘等级:	F-155°C.

输入端口:

⤴ 阻抗:	20 KΩ.
⤴ 电压范围:	12 V DC to 60 V DC, 100 V AC to 230 V AC .

输出端口:

⤴ 继电器触点:	常闭
⤴ 继电器功率:	50 mW.
⤴ 响应时间:	5 ms.
⤴ 输出电流:	≤150 mA.
⤴ 电压:	230 V AC.

性能参数:

⤴ 开门速度:	200...700 mm/s.
⤴ 关门速度:	150...400 mm/s.
⤴ 安全力:	60...150 N 可调.

DECLARATION OF CONFORMITY 符合性声明

*Tecnolama, S.A.
Ctra. Constanti Km. 3
43206 REUS (Espana)*

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

在此声明，以下产品符合欧洲标准：



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

符合欧盟委员会EMC电磁兼容性标准2014/30/EU

符合电梯产品行业标准EN12015: 2014和 EN12016: 2013

VF5+ Electronic Module门机控制器
(14/31707704_M1)

Tecnolama S.A., 2014

A handwritten signature in black ink, appearing to be 'Josep Vila Gomis', written over a horizontal line.

Josep Vila Gomis
Administrator