

DOOR DRIVE

VF5+ULTRA



USER MANUAL

SICOR ITALY
AN  ELEVANTIS COMPANY

sicoritaly.com



MUM0368 REV. 01 - ENG

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1 Safety information



- Only qualified technicians are allowed to install and maintain the VF5+ULTRA door drive.
- AC input power must be disconnected before any wiring to the VF5+ULTRA door drive is made.
- Connect always the **terminal 6** to a ground. The grounding method must comply with the local standards of the country where the door controller is installed.
- DO NOT install the VF5+ULTRA door drive in a place subject to high temperature, direct sunlight, high humidity, excessive vibration, corrosive gases or liquids, or airborne dust.
- If the VF5+ULTRA door drive is stored in no charge condition for more than 3 months, the temperature should not exceed 86°F / 30°C. Storage longer than one year is not recommended.

2 Electrical connections

2.1 Power

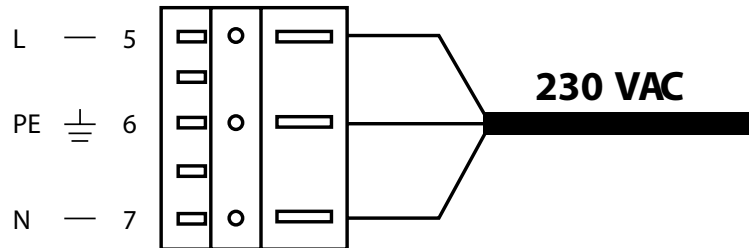
- 230 Vac - 5, 6, 7

The unit is designed to operate on a main supply of 230 Vac (+10%, -15%, 50 or 60 Hz). The unit consumes approximately 100 W. A good earth (ground) connection is essential for VF5+ULTRA door drive.

The VF5+ULTRA drive includes a soft-start system to control the charging of bulk capacitors and prevent short circuits. The VF5+ULTRA door drive complies with the FCC47 CFR-part 15 subpart B / EN 12016:2013 electromagnetic compatibility product family standard for lifts, escalator and moving walks.

- ON/OFF switch 57:

Disconnects the door drive from the main power supply.



2.2 Control inputs

The VF5+ULTRA drive can operate with either external voltage or internal voltage using voltage-free contact.

- Close signal 8:

Used to command the door to close.

- +12 Vdc output 9:

An isolated 12 Vdc output available for controlling the door via a voltage-free contact.

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

- Common 10:

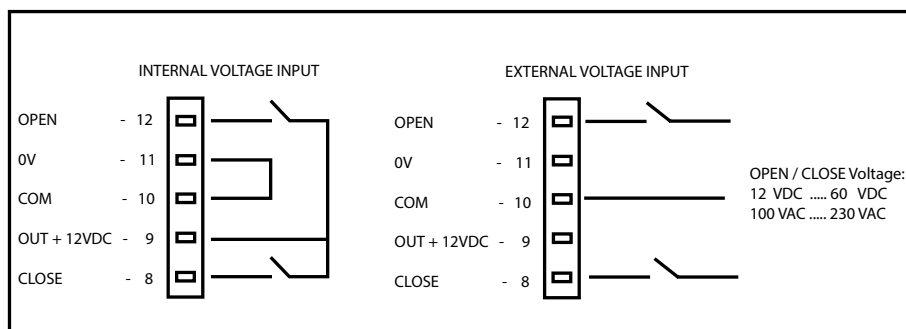
Used as a reference for the opening and closing signals.

- 0 Vdc output 11:

Connected to common 10 in case of using the internal voltage +12 Vdc to command the door opening and closing.

- Open signal 12:

A signal commands the door to open. The voltage can have a range from 12 Vdc to 60 Vdc or 120 Vac to 230 Vac, with an external supply between this input and the common.



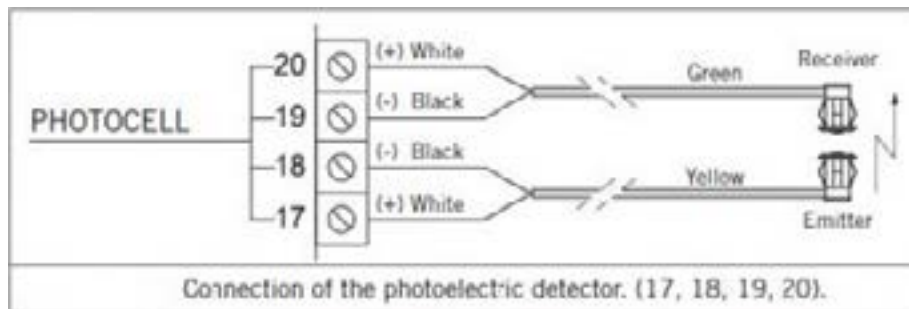
2.3 Serial port 13

The serial port is an RJ11 connector and is used for connecting bluetooth device (dongle).

2 Electrical connections

2.4 Photocell 17, 18, 19, 20

The option to incorporate the photocell. It is composed by a emitter and receptor infrared.



2.5 Priority inputs

- Re-open 21:

This input can be used by the controller of a photocell or when the door controller detects an obstruction. To activate this signal, connect the "re-open" input 21 to +12 Vdc 23 using voltage-free contacts. The re-open signal has priority over the closing signal.

- +12 Vdc common 23:

Used to issue a reopening order or a slow closing command via an isolated contact. Always use voltage-free contacts, which are usually open.

- Slow close 25 "nudging"

Commands the door to close slowly. The slow signal takes priority over control signals and the photocell. It is intended for use with fire detection systems.

2.6 Output relays and led indicators

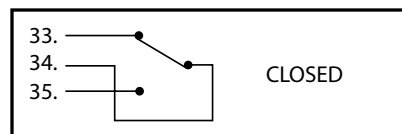
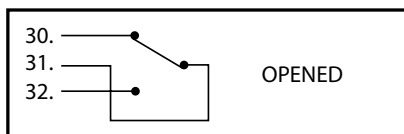
Output relays provide continuous status information to the main elevator controller regarding the doors. These relays can be used by the main elevator controller to indicate:

- Opened 30,31, 32:

When the doors are fully open, the led indicator will illuminate, and relay will switch position.

- Closed 33, 34, 35:

When the doors are fully closed and locked, the led indicator will illuminate, and relay will switch position.

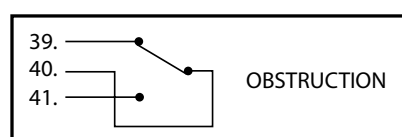
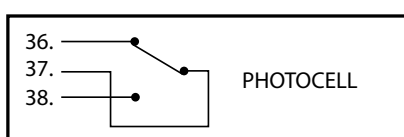


- Photocell 36, 37, 38:

Led indicator and relay activated when the photocell or the reopening input is operated.

- Obstruction 39, 40, 41:

Led indicator and relay activate when an obstacle is detected, preventing the doors from closing. The signal resets automatically.



2 Electrical connections

2.7 Push-buttons onboard

- Test push-button 50:

Activates a door open or close cycle for testing purposes.

- Auto-adjustment push-button 51:

Used to set up the doors. The doors will perform five complete movements to detect the motor and the clear opening. The microprocessor calculates acceleration, deceleration ramps, and braking torque required for optimal door control. After autoadjustment, the parameters are stored in non-volatile EEPROM and used for optimal performance. After the power is restored, the doors will open slowly for the first operation. Auto-adjustment is required when setting initial parameters.

2.8 Encoder and motor

- Encoder plug 55:

An integral quadrature pulse encoder located inside the motor provides precise information about the door's position and speed.

The VF5+ULTRA door drive is compatible with the standard encoder of the asynchronous motor connected with 4 wires, and with the high-resolution encoder for the synchronous PM motor connected with 5 wires.

The asynchronous motor encoder 4 wires should be connected to the 4 pins of the VF5+ULTRA encoder plug marked as "ASYNC." on its label.

- Motor plug 56:

Provides output 3-phase for the motor.

PM10 _____



ASYNC. MOTOR _____



3. Mobile app configuration: programming VF5+ULTRA

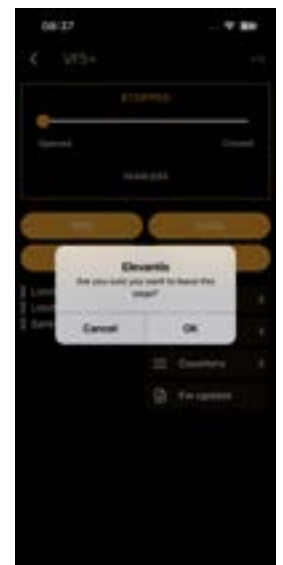
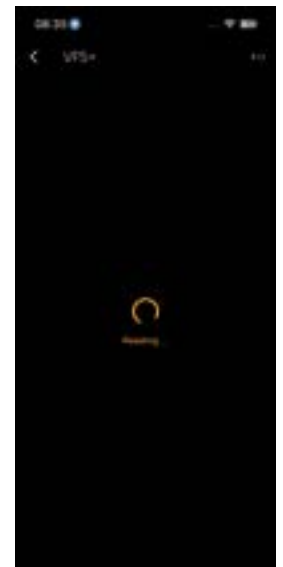
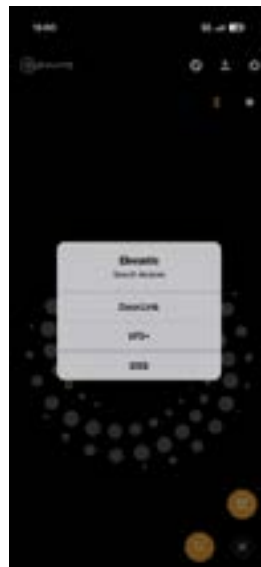
The VF5+ULTRA is equipped with a bluetooth device to be plugged in a RJ11 connector (serial port 13) and using the ELEVANTIS App on your smartphone it's possible to have the remote control of the VF5+ULTRA door drive.

This allows the lift engineers to command the doors standing in a safe position, without direct contact with VF5+ULTRA door drive or movement parts.

Using the dongle is possible to view and adjust the door speed profile to obtain the perfect movement in opening and closing.

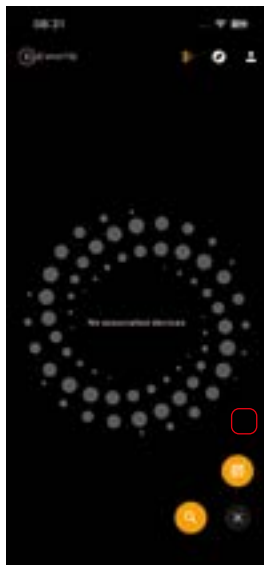
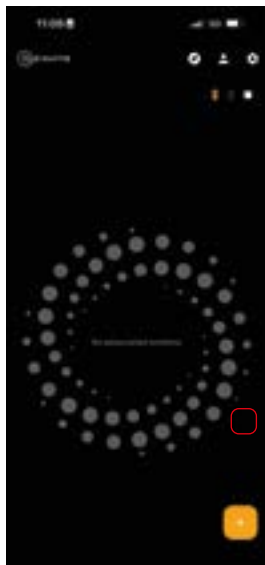
How to connect a new Dongle:

- Download the ELEVANTIS App
- Register your account
- Press search button and follow the steps to connect your device.
- Select the drive train configuration of the door operator: direct drive or geared drive



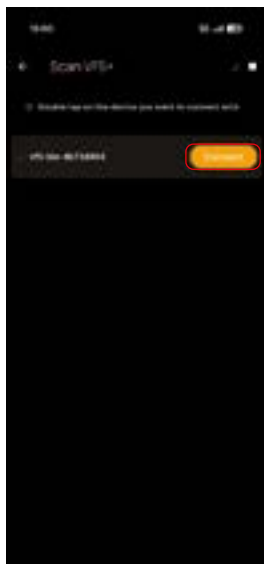
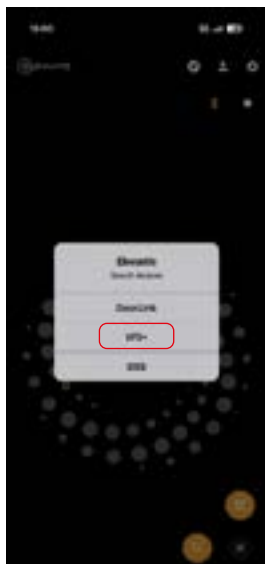
3. Mobile app configuration: programming VF5+ULTRA

3.1 BLE ELEVANTIS Mobile App



DEVICE CONNECTION:

This is the first page that appears when the mobile app is opened. The list of local devices is shown. Select the device to be connected from the BLE list devices found.



MENU:

This is the main menu page that can be accessed:

- Parameters
- Status
- Counters

In the same page is possible to send OPEN/CLOSED commands, and is possible to start AUTOADJUST procedure or NUDGING.

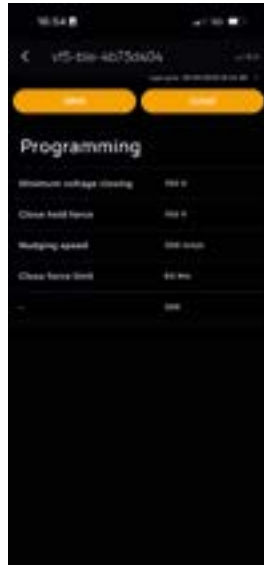
Status information of the door are present.

The status door informations are:

- Limit opening
- Limit closing
- Safety edge

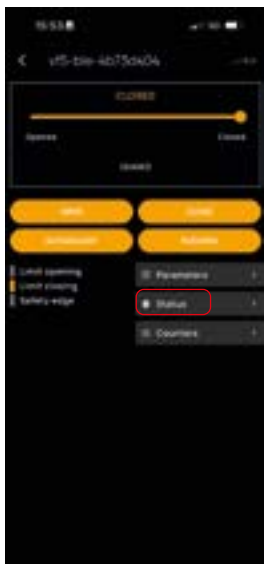


3. Mobile app configuration: programming VF5+ULTRA



PARAMETERS:

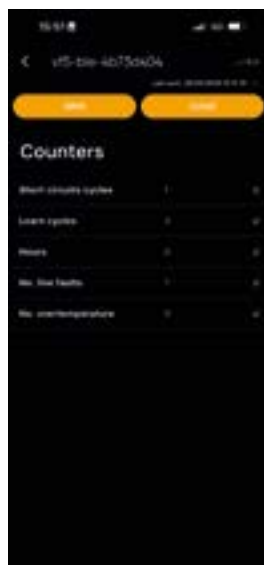
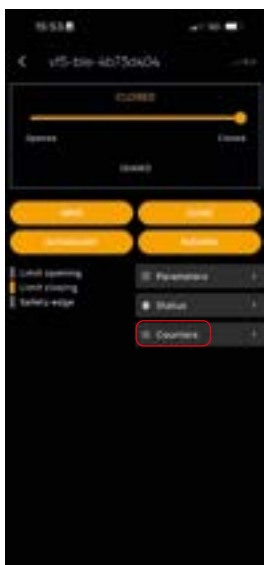
List of the parameters that can be configured.



STATUS:

List of status of the:

- DIP switch
- Line volts
- Active faults
- Temperature

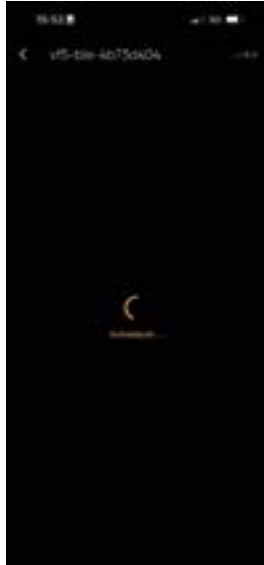
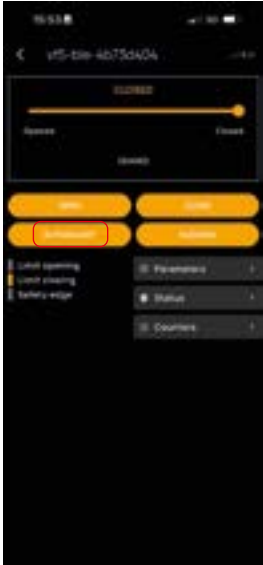


COUNTERS:

List of counters:

- Short circuit cycles
- Learn cycles
- Hours
- No line faults
- No overtemperature

3. Mobile app configuration: programming VF5+ULTRA



AUTOADJUST (App setup mode):

If the auto-adjust button is clicked, the end-of-line self-learning procedure will start; at the end of the procedure, you can choose whether it is:

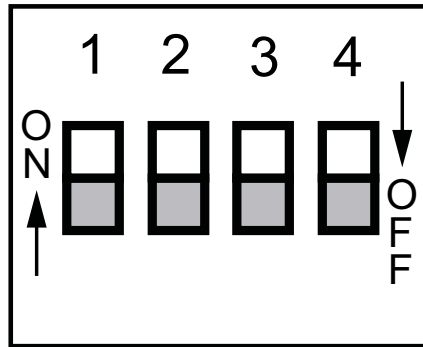
- Geared drive
- Direct drive



4 Local setup mode: programming VF5+ULTRA

The door drive can be programmed using the DIP switches on the front panel.

If you make any changes to the DIP switch settings, you must turn OFF the main power supply of the unit and then ON again for the new settings to take effect.



DIP Switch Functions:

1

ON: 1 Input

- The door control unit operates with a single input.
- Any voltage between 12 Vdc and 60 Vdc, or 100 Vac and 230 Vac applied between terminals 8 and 10 will close the doors.
- When there is no active input, the door remains open.
- The "Open" input is not used.

OFF: 2 Inputs

- The door control unit operates with two independent inputs.
- Voltage between 12 Vdc and 60 Vdc, or 100 Vac and 230 Vac, applied between **terminals 8 and 10**, will close the doors, while voltage between **terminals 10 and 12** will open the doors.
- In the absence of any signal, the doors remain stationary.
- If both inputs are active, the "Open" signal takes priority.

2

ON: Automatic Sliding Door Landings

- Set dip switch 2 to ON for car door operators used in automatic applications which deploy a skate to manipulate the sliding landing door pickup rollers and interlocks.

OFF: Manual Swing Door Landings

- Set dip switch 2 to OFF for car door operators used with manual swing doors on the landing where a skate will not be required.

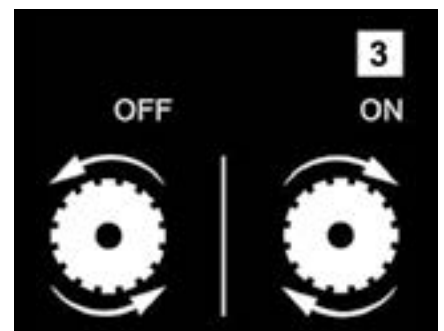
3

ON: CW MOTOR ROTATION DIRECTION

- Set dip switch 3 to ON for all speeds of center-opening entrances and all speeds of side-sliding entrances that close to the left. When standing outside the elevator, left-hand entrances can be identified by the strike post located on the left side of the frame.

OFF: CCW MOTOR ROTATION DIRECTION

- Set dip switch 3 to OFF for all speeds of side-sliding entrances that close to the right. When standing outside the elevator, right-hand entrances can be identified by the strike post located on the right side of the frame.



4

ON: Master

- The door control unit performs priority functions, such as reopening the doors when an obstruction signal is received from the re-open **contact 21**, without needing further instructions from the main elevator controller.

OFF: Slave

- The doors only respond to instructions from the main elevator controller.
- Priority inputs are not active in this mode.

4 Local setup mode: programming VF5+ULTRA

4.1 Auto-adjustment procedure

- Switch OFF the power supply and move the door in a closed position.
- Disconnect the inputs plug 8-12 and the priority inputs plug 21-25 if connected.
- Switch ON the power supply and press the auto adjustment push-button 51.

For the correct setting of the door system, it will make five movements:

- 1st movement: the door should open approx. 8" / 200 mm
Note: if the door is not open and makes a small rebound, the position of dip switch 3 must be changed.
- 2nd movement: the door will close approx. 6" / 150 mm
- 3rd movement: the door will close at a slow speed to detect the final closed position.
- 4th movement: the door will open at a slow speed to detect the final opened position.
- 5th movement: the door will close after a short delay and will calculate the acceleration, deceleration ramps, and braking torque required for optimal door control.

5 Troubleshooting during auto-adjustment

- VF5+ULTRA door drive does not respond to the test or auto-adjustment button:

Turn OFF and then ON again, the power of VF5+ULTRA door drives. If there is still no response, replace the VF5+ULTRA door drive.

- Door does not move:

Check the motor cable and its connection to the motor connector.

Check that a variable voltage is applied to the motor when a movement order is given. The voltage will differ when the door stops in the closed or open position, as torque is needed to maintain the open position.

Replace the motor if no movement occurs when voltage is present.

- Door stops before completing the learning cycle:

Check the encoder, may be disconnected, not powered, damaged, or the pulley screw may be improperly tightened.

- Door opens instead of closing:

Check the position of dip switch 3.

Reverse two phases of the motor connection on plug 56.

- Door completes learning phase but clutch stays open with closed relay active:

Verify the position of switch 2 to ensure the correct opening direction of the door.

- Door stops in the clutch zone:

Check by hand that the skate moves correctly and smoothly.

- Door does not close completely:

Disconnect the entire system and check for any obstructions.

Always perform the tests in this order to ensure correct movement and verification in a known sequence.

6 Normal regulation with the elevator controller

If the auto-adjustment was successfully completed, you can proceed with the connections to the elevator controller and adjust the speeds from the app.

- **A. Connect the wires from the elevator controller:**

Connect command inputs 8, 9, 10, 11, 12 and priority inputs 21, 25, and 23.

Connect the relay output that provides information to the elevator controller from 30 to 41.

Note: switch OFF the VF5+ULTRA door drive power before connecting the open and close commands. Do not mix the VF5+ULTRA door drive internal voltage +12 Vdc and 0 Vdc with the elevator controller voltage which can be from 12 Vdc to 60 Vdc and 100 Vac to 230 Vac.

- **B. Test the door:**

Check the door operation using the app on your smartphone. Adjust the parameters if needed to achieve the perfect door speed profile.

7 Power failures

The VF5+ULTRA door drive includes two safety systems to address power failures:

- **Anti-banging system: (available for operators fitted with permanent magnet motors)**

When a power failure occurs while the door is opening, closing, or fully open, the anti-banging system breaks the PM motor to perform a controlled, slow closing. This prevents the door from slamming shut during a power outage.

- **CDL electronic system:**

When a power failure occurs while the door is fully closed, the VF5+ULTRA drive detects the voltage drop and opens the CDL (Car Door Lock) if the cabin is at the floor level. This safety feature is designed to be used with a CDL that does not have a spring mechanism. The CDL electronic system can only be enabled or disabled via software on the programming tool.

8 Troubleshooting

- The door only closes 35 cm:

This indicates that the controller has not been adjusted. An auto-adjustment is required (refer to the auto-adjustment procedure).

- The Door Opens but Doesn't Close:

Check if the "open" input 8 is not continuously active.

Use a multimeter to check if close signal 12 is reaching the system. Replace the VF control if the voltage is present but the door does not close.

Check if the re-opening signal 21 is active.

Ensure there is no stray voltage in the open signal.

- The door reopens by itself:

Check the sensitivity of the re-opening safety regulation.

Verify that there is no mechanical obstruction on the door.

- The door doesn't reach the fully open position:

Verify the mechanical adjustments of the door. The motor should have enough torque to open the doors up to a clear opening of 54" / 1400 mm in direct drive.

- The door reopens when the clutch is closing:

Check the regulation of the skate. The locking system of the skate may not be properly adjusted, causing mechanical friction. Verify if the obstruction led is lit.

- The door hits when it opens:

Ensure that the skate unlocking mechanism is properly fixed before the door begins to open. If the skate is not fully secured, adjust the skate mechanism, as it may be too tight.

- The door hits when it reaches the fully open position, the "open" led is not activated, and the system malfunctions:

Check the tension of the tooth belt. If it is not properly adjusted, it may slip on the motor pulley, causing incorrect encoder signals. Adjust the tension of the tooth belt and perform the auto-adjustment again.

- The system gets power, but the "on" led is off:

Check if both external fuses are blown. Replace them with new fuses (250 Vac, 4 A ceramic fast speed).

- The motor is moving intermittently:

Check the wiring connections or if one phase of the motor is failing.

Check that the encoder pulley is properly assembled.

- The "on" led is activated, but the door does not respond to signals:

There may have been an obstruction while opening and that causing an "out of order" state for 15 seconds.

In slave mode, continuous obstruction may occur if the elevator controller has not switched from the close signal to the open signal.

A short circuit may have occurred in the motor output, causing the door drive "out of order" for 3 seconds.

9 Test of the photocell

Remove the photocell wiring from any place where there are "electric noise" such as motors, supplies wiring, etc.

1. 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).

2. Connect the photocell (on the operator)

Even if you will not install the photocell, make the learning of the photocell to avoid that the photocell relay is active by no reason. Once the photocell is verified, it is possible to disconnect it and the VF control will detect that is not connected anymore.

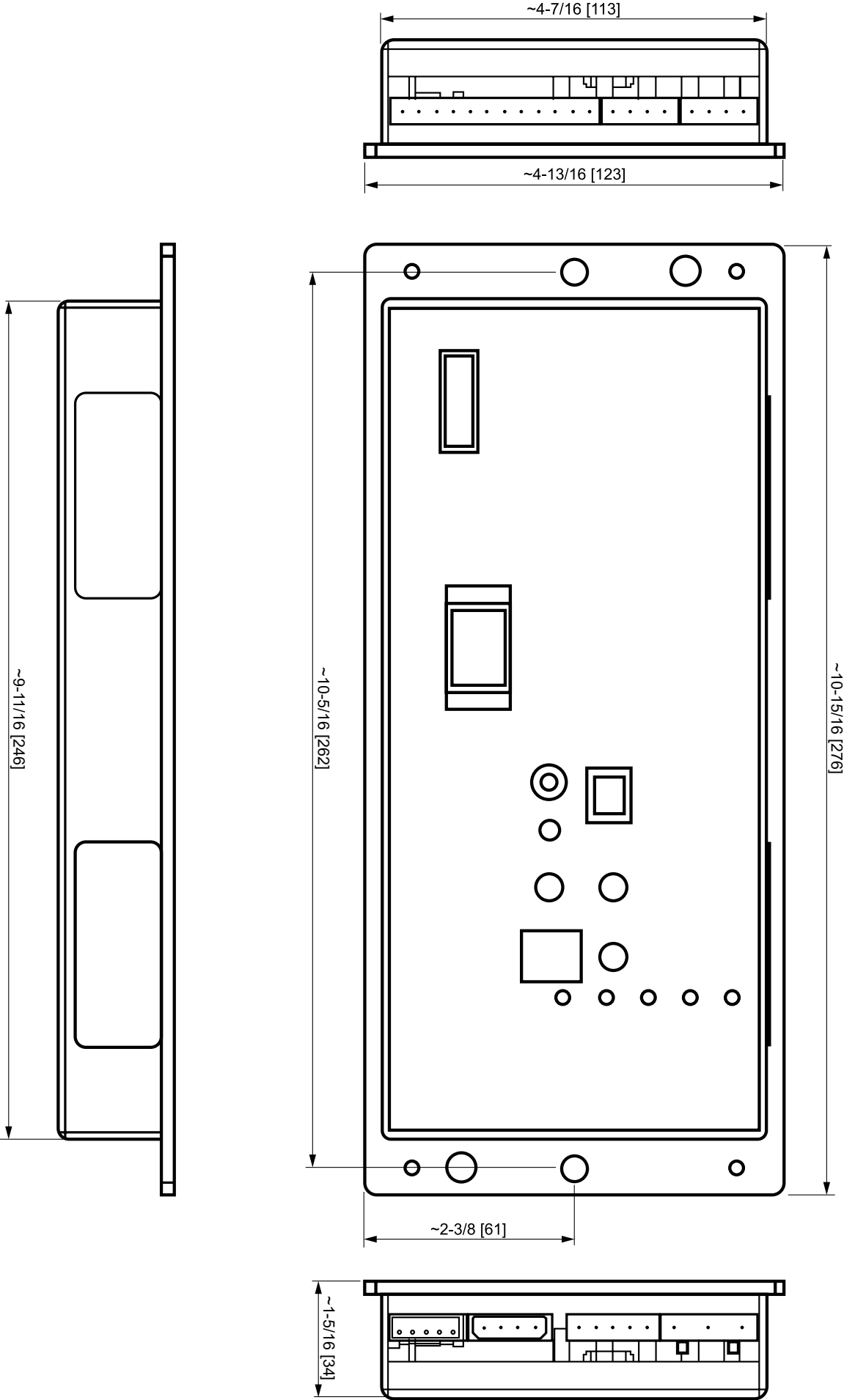
3. Put the capsules face to face at a minimum distance of 50cm, make the autoadjustment process without hitting the capsules, once done, make a open and a close movement, and then block the photocell with the hand during the close movement to check that the photocell relay is active every time the hand is in the middle of the infrared beam.

PROBLEMS WITH THE PHOTOCCELL.

- The photocell is active intermitently

- 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.
- Do not extend the wires.
- Take in mind that in master mode the system recognizes automatically the photocell detector after making a complete learning cycle with the beam free controlled by the input signals.

10 External dimensions



11 Technical sheet

		Electrical characteristics		
		Minimum	Nominal	Maximum
Input voltage range	[In AC]	100	230	300
Frequency range	[Hz]	50	--	60
Input intensity range	[A]	--	--	0.55
Output intensity range	[A]	--	--	0.85
Power inlet socket	[W]	--	--	126
Output power range	[W]	--	--	100

		Protection values		
Protection class		Protection Class I ⁽¹⁾		
Residual current device (RCD)		Type A residual current circuit breaker (Recommended)		
Overvoltage category		Overvoltage category III		
Power supply system		Device connected to the ground according to scheme TT, NT, IT, not corner earthed		
Short-circuit current intensity (SCCR)	kA	--	--	1.5
IP Index	[]	--	--	20

1. The accessible connectors and listed parts below are protected Class 0 This means that the the protection of these circuits relies only on standard insulation and only becomes dangerous if The standard insulation is damaged. That is why the devices connected to these circuits must be equipped of protection against electric shocks as if they were directly connected to the source of food supply. Furthermore, during the installation, these parts must be considered regarding electric shocks, like main power sources.

Class 0 Circuits: ENTRIES 8, 9, 10, 11, 12
 COMMUNICATION SERIES 13
 PHOTO CELLS 17, 18, 19, 20
 PRIORITY ENTRIES 21, 23, 25, 26
 ENGINE ENCODER 55

		Environmental data		
		Minimum	Nominal	Maximum
Operating conditions and storage	[°C]	-10	--	80
Ambient temperature	[°C]	-10	--	50
Humidity	[%]	--	--	95
Altitude	[m]	--	--	2000
Degree of pollution	[]	--	--	2
Case materials	[]	PAG 6/6		

		Mechanical characteristics		
Dimensions	[mm]	278	123	34
Mass	[kg]	1,59		
Assembly instructions				

		Motor data PM		
Type		Permanent magnet synchronous motor		
Number of poles		10		
		Electrical characteristics		
		Minimum	Nominal	Maximum
Power supply voltage	[V]	50	103	144
Intensity	[A]	0.18	1.13	2.13
Power	[W]	15	162	405
Coupe	[N-m]	0	1.5	2.5
Speed	[r.p.m.]	600		
		Thermal class		
Encoder		Magnetic Incremental ABI (channel A, channel and index).		
Precision	[pulsation/tr]	--	180	--

11 Technical sheet

		VF engine data		
Type	Asynchronous three-phase			
Number of poles	6			
		Electrical characteristics		
		Minimum	Nominal	Maximum
Power supply voltage	[In AC]	200		
Intensity	[A]	0.58	0.82	1.53
Power	[W]	90	220	440
Coupe	[N.m]	0.38	1.28	1.98
Speed	[r.p.m.]	975	900	630
		Thermal class		
Encoder	--			
Precision	[pulsation/tr]	--	8	--

Wiring requirement on female connector				
		Minimum	Nominal	Maximum
Food	[mm² AWG]	0.08 / 28	--	2.5 / 12
Entrées	[mm² AWG]	0.08 / 28	--	2.5 / 12
Priority entries	[mm² AWG]	0.08 / 28	--	2.5 / 12
Outputs	[mm² AWG]	0.08 / 28	--	2.5 / 12
Engine power	[mm² AWG]	--	0.75 / 18	--
Motor encoder	[mm² AWG]	--	0.14 / 26	--
Photoelectric cells	[mm² AWG]	0.08 / 28	--	2.5 / 12

Input signals				
Impedance	[kΩ]	20		
Tension	[V DC]	12 to 60		
	[V AC]	100 to 230		

--				
		Minimum	Nominal	Maximum
Contacts	[]	Contacts without polarity		
Contact resistance	[Ω]	--	--	100
Reaction time	[ms]	--	--	7
Return time	[ms]	--	--	3
Limit intensity	[mA]	--	--	150
Tension	[In AC]	--	--	125

Services				
		Minimum	Nominal	Maximum
Opening speed	[m/s]	0.2	--	0.7
Closing speed	[m/s]	0.15	--	0.4
Security effort	[N]	60	--	150

Normative references				
EMC	EN 12015: 2014	Electromagnetic compatibility Product family standard for elevators, escalators and moving walkways - Emission		
	EN 12016: 2013	Electromagnetic compatibility Product family standard for elevators, escalators and moving walkways - Immunity		
Security	EN 61800-5-1:2007	Variable speed power electrical drives Part 5-1: security requirements - Electrical, thermal, and energy		



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