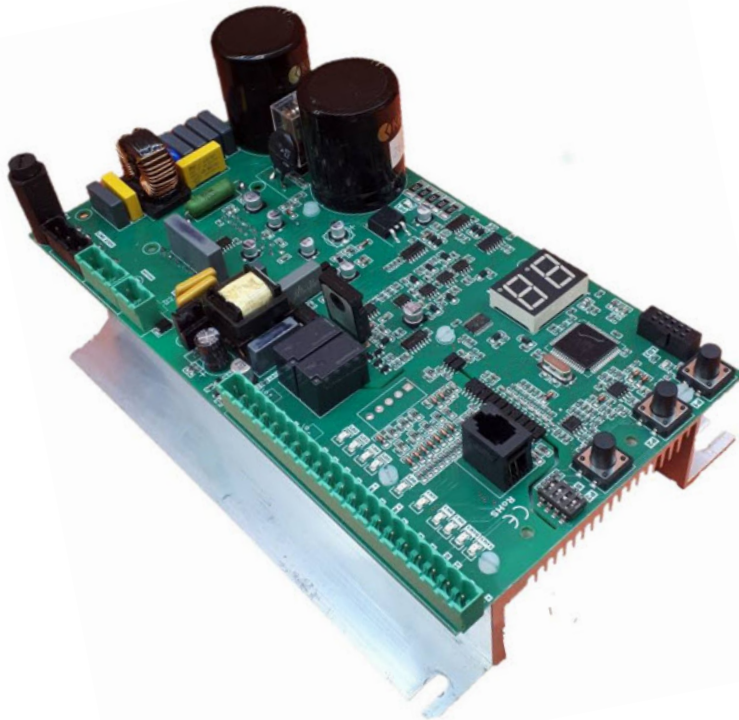


# INSTRUCTION MANUAL

## INVERTER automations control panel

# INV



**For Industrial automation**  
**230Vac single phase power supply**  
**230Vac three-phase motor output**



**WARNING!!** Before installing, thoroughly read this manual that is an integral part of this Kit. VDS declines any responsibility in the event current standards in the country of installation are not complied with.



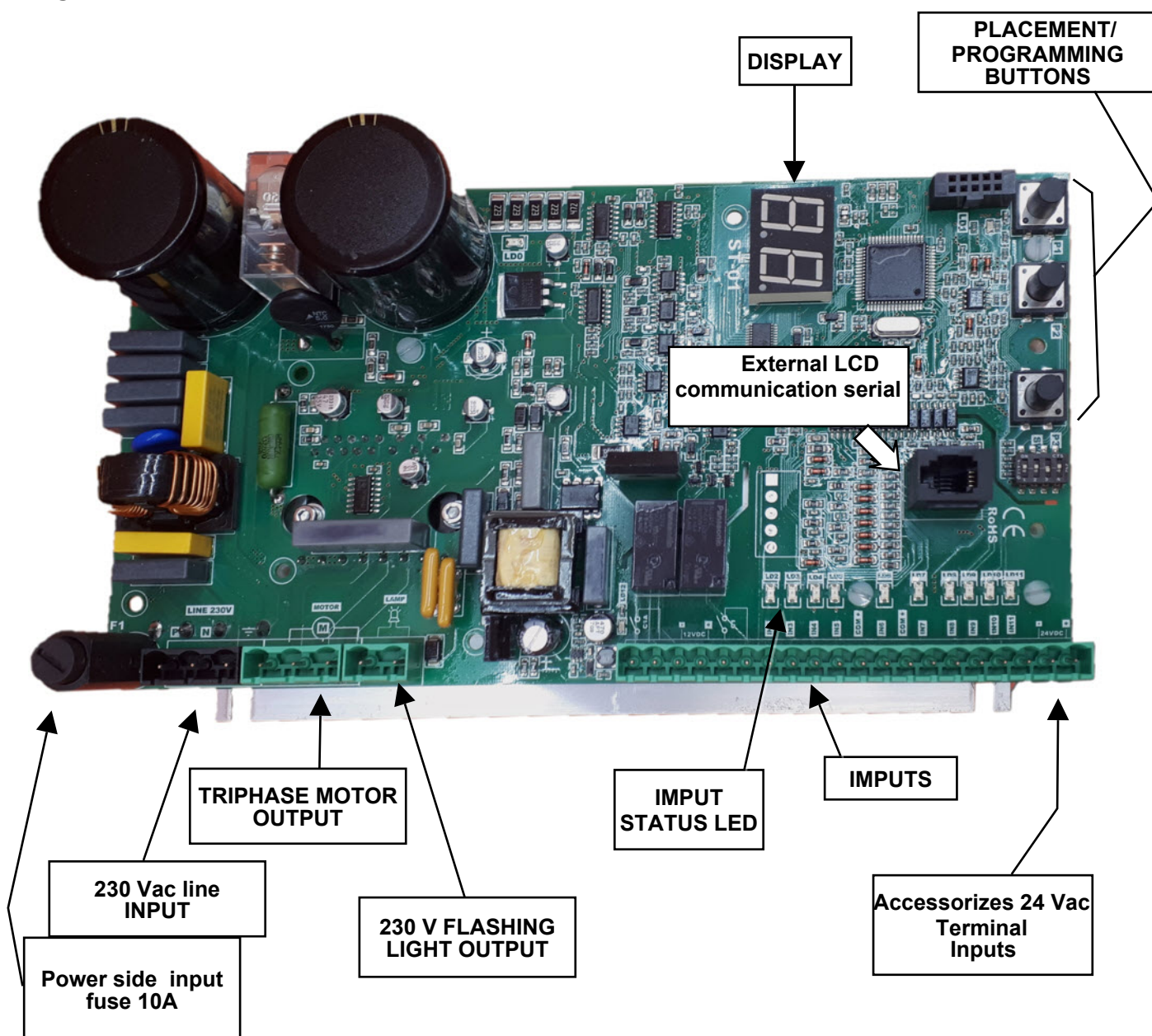


**FOR CORRECT OPERATION OF THE EQUIPMENT, WE RECOMMEND  
INSTALLING A 230V MAINS STABILISER**

## Main features:

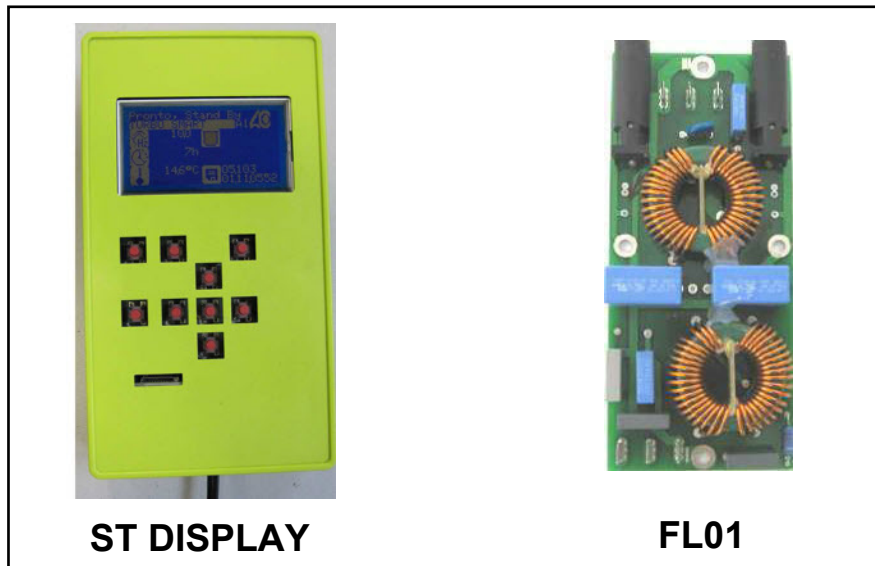
- Open and close Frequency of work separately adjustable
- Acceleration Ramp / adjustable deceleration and slowdown speed
- Amperometric with obstacle sensitivity adjustable in opening and in closing
- Logic obstacle inversion adjustable in opening and in closing.
- Input for safety edge NC / 8.2 kohm
- Inputs for photocell-safeties in opening and closing
- Inputs Open / Close / Partial and Step-by-Step
- Programs modes : automatic, semi-automatic or deadman selectable
- Inputs status and functions viewable on display
- Optional plug-in receiver plug-in for the management of fixed code transmitters or Rolling-code

## Layout description



## General Characteristics :

- Programming and self-learning via keys (increase, decrease, validation) and a figures display
- Management of three safety devices as photocell, a safety device inclosing and in opening.
- Contact for signaling automation / alarm state
- 12Vac Contact for control safety / auxiliary functions power
- Serial with plug for external handheld ST-DISPLAY connection
- Inputs status Self-diagnosis and function parameter display by ST-DISPLAY
- Predisposition plug-in Radio
- Extractable power and signal Terminals
- Predisposed for coupling with filter FL\_01
- Complies with European Directives Reference:  
Low Voltage 73/23 / EEC  
Electromagnetic Compatibility (EMC) Directive 89/336 / EEC  
**(NB: only if installed mains filter FL-01 or equivalent)**



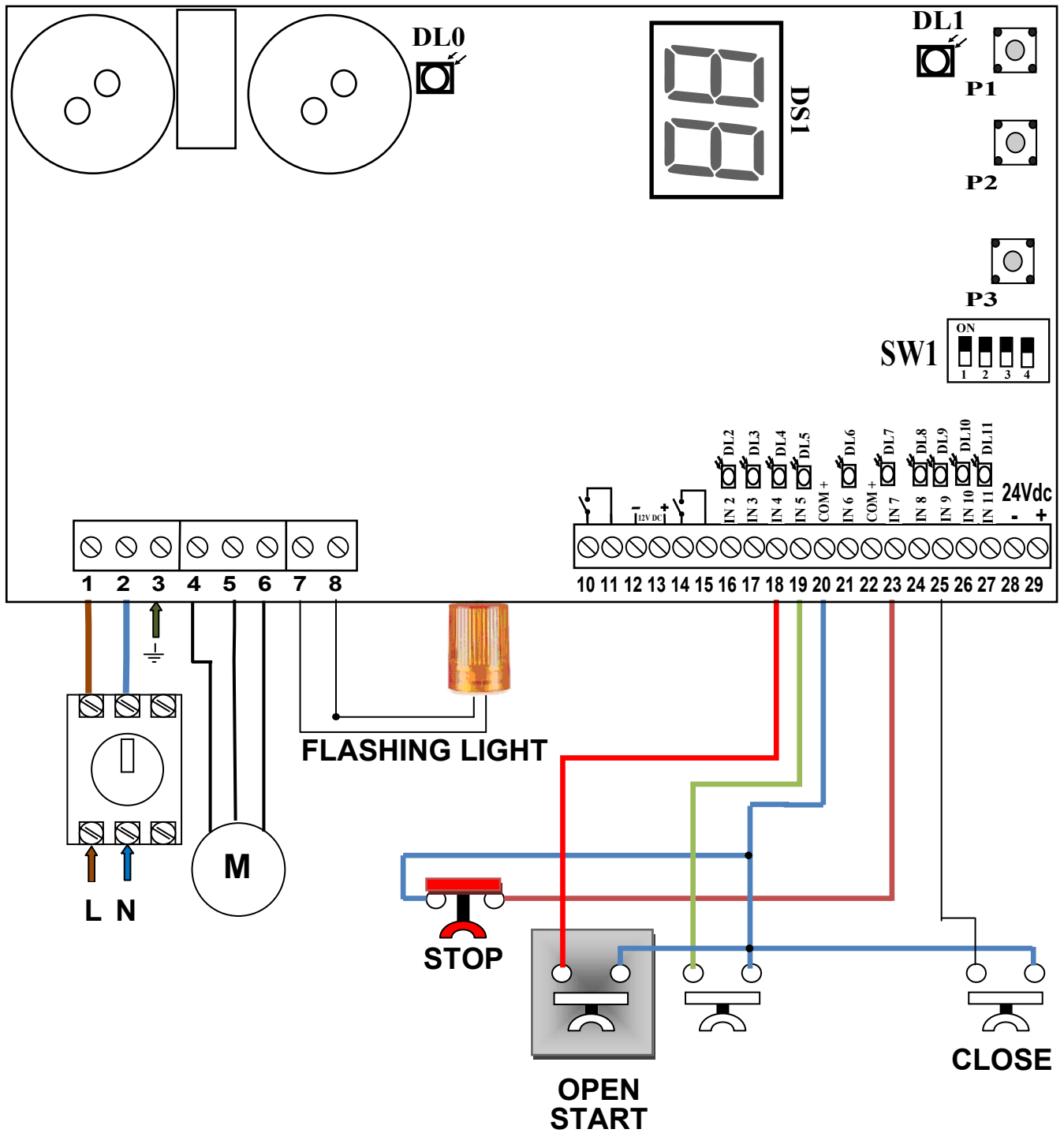
## Specifications:

|                                      |                                                                             |
|--------------------------------------|-----------------------------------------------------------------------------|
| <b>Power supply</b>                  | 230Vac                                                                      |
| <b>Output Motor</b>                  | Three phase 230 VAC – Single phase 230 Vac                                  |
| <b>Three phase motor connection</b>  | Triangle                                                                    |
| <b>Single phase motor connection</b> | No capacitor                                                                |
| <b>Motor power</b>                   | 2HP                                                                         |
| <b>Environmental conditions</b>      | -20°C / + 55 °C                                                             |
| <b>Accessories power supply</b>      | 12-24 VDC/AC – 4 Watt<br>For higher powers, install an external transformer |

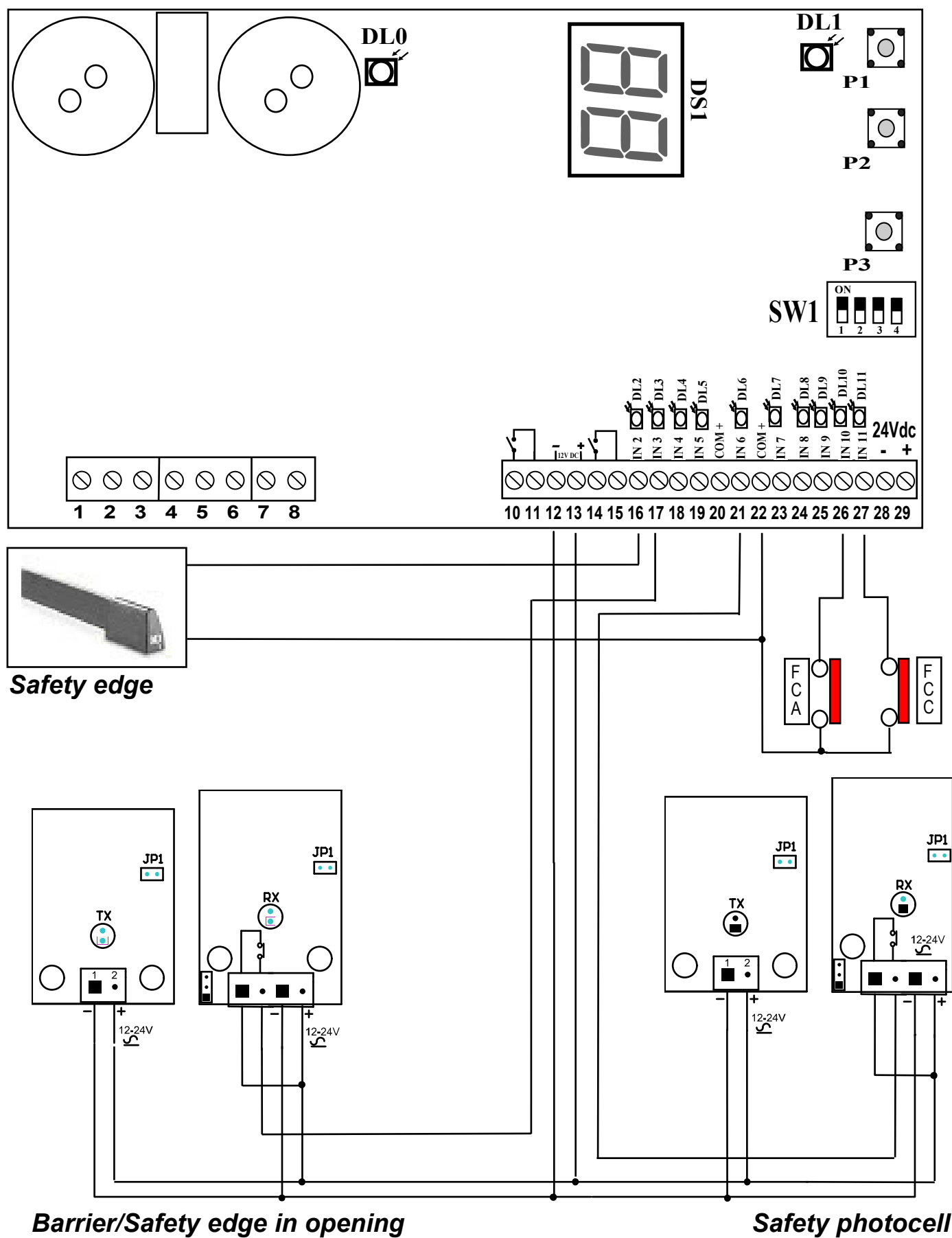
## Protections:

- Motor protected by a fuse and electronic control
- Power circuits electronically protected by varistors.
- Secondary transformer, protected by self-resetting fuse and transil.
- Filter capacitors on the input network

# Wiring MOTOR / FLASHING LIGHT/ COMMANDS / SAFETY DEVICES



# SAFETY DEVICES WIRINGS



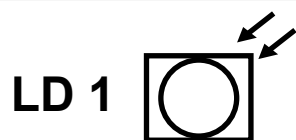
## Terminal numbering / LEDs meaning

|                                                                                   |          |                                   |
|-----------------------------------------------------------------------------------|----------|-----------------------------------|
|  | <b>1</b> | Input Phase Power Supply 230Vac   |
|  | <b>2</b> | Input Neutral Power Supply 230Vac |
|  | <b>3</b> | Input Ground Power Supply 230Vac  |
|  | <b>4</b> | Output Phase 1 motor              |
|  | <b>5</b> | Output Phase 2 motore             |
|  | <b>6</b> | Output Phase 3 motor              |
|  | <b>7</b> | Output flashing light 230V        |
|  | <b>8</b> | Common flashing light             |



**Led indication discharge of capacitors.**

After disconnecting the power supply, wait LD0 turns off before working on the controller.



**LED ACTIVITY  
MICROCONTROLLER**

|                                                                                     |           |                                      |
|-------------------------------------------------------------------------------------|-----------|--------------------------------------|
|    | <b>10</b> | Output voltage con tact NO           |
|   | <b>11</b> |                                      |
|  | <b>12</b> | OUTPUT-12Vdc accessoires             |
|  | <b>13</b> | OUTPUT +12Vdc accessoires (common)   |
|  | <b>14</b> | Output voltage con tact NO           |
|  | <b>15</b> |                                      |
|  | <b>16</b> | INPUT safety edge                    |
|  | <b>17</b> | INPUT barrier/safety edge in opening |
|  | <b>18</b> | INPUT START                          |
|  | <b>19</b> | INPUT PEDESTRIAN                     |
|  | <b>20</b> | Common inputs 12Vdc                  |
|  | <b>21</b> | INPUT safety photocell               |
|  | <b>22</b> | COMMON inputs 12Vdc                  |
|  | <b>23</b> | INPUT STOP                           |
|  | <b>24</b> | INPUT OPEN                           |
|  | <b>25</b> | INPUT CLOSE                          |
|  | <b>26</b> | INPUT OPEN LIMIT SWITCH              |
|  | <b>27</b> | INPUT CLOSE LIMIT SWITCH             |
|  | <b>28</b> | Output - 24Vdc                       |
|  | <b>29</b> | Output +24Vdc                        |

|                                                                                      |      |
|--------------------------------------------------------------------------------------|------|
|  | LD2  |
|  | LD3  |
|  | LD4  |
|  | LD5  |
|  | LD6  |
|  | LD7  |
|  | LD8  |
|  | LD9  |
|  | LD10 |
|  | LD11 |

## SETTINGS and PROGRAMMING

- **Verify the direction of rotation of motor**

After connecting, unlock the motor , place the door outside the closing limit switch,

re-lock the engine and give power to the electrical panel.

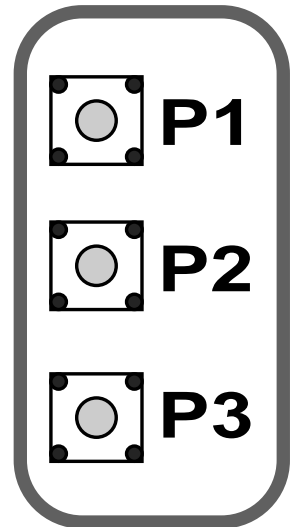
Use buttons on board having the following features:

**P1 key CLOSE**

**P2 key OPEN**

**P3 key CONFIRM / SELECT PROGRAMMING PHASE**

- Check that pressing the P1 the door closes and bring it up to the closed position, verify that LD11 goes off.
- Otherwise reverse ONLY 2 of the 3 motor phases.



- Check that on the display DS1 appears the message **[H = DOOR CLOSED**

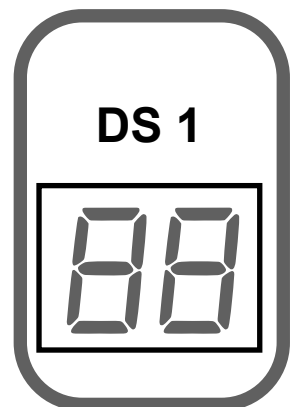
- Check that the LED LD11 related to FCC is off

- **Function 01 - Select type of automation motor three-phase 230Vac**

**01** = PS (Sliding Door / Sectional / Gate).

**02** = TOM Motor Configuration

**03** = PL (Folding Door).



### PROCEDURE:

Press P3 until the display shows **01** and release.

Press again P3 and release.

The display shows **0.2** = TOM

**(NOTE: The sub-menu selection is distinguished from the point after the digit).**

If you need to select another type of automation, act on the P2 button to display the number corresponding to the type of automation desired.

Confirm pressing P3 (at this point will disappear the dots to the left of the digits).

**After programming follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) | you see **E5**

Confirm pressing **P3**.

Note:

| FACTORY SETTING                       | Min/Max | Pre-set |      |      |
|---------------------------------------|---------|---------|------|------|
|                                       |         | PS      | PF   | PL   |
| Opening speed frequency in Hz         | 01 ÷ 99 | 50Hz    | 25Hz | 50Hz |
| Closing speed frequency in Hz         | 01 ÷ 99 | 50Hz    | 25Hz | 50Hz |
| Opening in slow speed frequency in Hz | 01 ÷ 99 | 25Hz    | 15Hz | 30Hz |
| Closing in slow speed frequency in Hz | 01 ÷ 99 | 25Hz    | 15Hz | 30Hz |

## Function 02 - Select type of automation motor single-phase 230Vac

0.1 = PS (Sliding Door / Sectional / Gate).

0.2 = PF (Fridge door).

0.3 = PL (Folding door).

### PROCEDURE:

Press P3 until 0.1 appears on the display, then release.

Press P2 (Forward) 0.2 appears

Press again P3 and release.

On Display appears 0.1 = Sliding door.

**(NOTE: The sub-menu selection is distinguished from the point after the digit).**

If you need to select another type of automation press the P2 button to display the number corresponding to the type of automation desired.

Confirm with P3.

**After programming follow the procedure for ESC:**

Press P2 (Forward) or P1 (Backward) until you see E5

Confirm pressing P3.

### • Learning of opening and closing work times

**⚠ Automation in the closed position and check the position of the DIP 4**

### PROCEDURE:

- Hold the P3 until the display shows E
- Press **start**: automation will start in opening
- Press start when you want to begin slowing down.
- Arrived on the opening limit switch, automation will stop.
- Wait until the desired wait time and press start.
- The automation starts closing.
- Press start when you want to begin slowing down.
- Arrived on the opening limit switch, automation will stop.

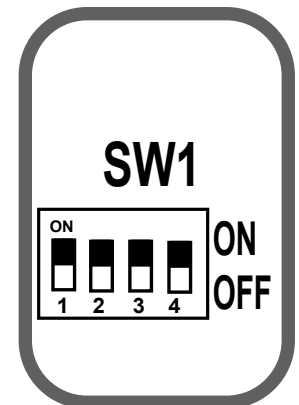
**NOTE: During this phase, the board detects the the current absorption curve, for the obstacle detection.**



- **Select type of logic for START input with DIP 4**

**⚠ This type of logic is to be selected after the Learning-Phase**

- **DIP4 in OFF** : The input-**Start Open**, assumes the function of the Start. So button connected to this input will function either by command that opens and closes.
- **DIP4 in ON** : The entrance Start-Open, assumes the function of command opens both impulsive or dead man. So, the button connected to this input, it will work just as command opens. In this case, will have to be used the Command Closes, (Close) for the reclosing.



- **Learning partial working time (Pedestrian)**

- Place the automation in closed position
- Hold the P3 until the display shows **E**
- Press pedestrian **start**: automation will start in opening
- Press pedestrian start when you want the automation to stop.
- Wait until the desired wait time and press pedestrian start.
- The automation starts closing.
- Arrived on the opening limit switch, automation will stop.

## **Function 03 - Changing pause time**

- Hold the P3 until the display shows **0** | e release P3
- Press repeatedly P2 until **03** appears on the display.
- Press P3 and on the display **0.4** appears = 4 seconds of pause or the one set in learning.
- Press the button P1 to increase and P2 to decrease the time in seconds
- Press P3 for confirmation

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **E5**

Confirm pressing **P3**.

## **Function 04 – Max torque adjustment.**

- Hold the P3 until the display shows **0** | e release P3
- Press repeatedly P2 until **04** appears on the display.
- Press P3, the display show **9.9** = the percentage of the maximum torque set.
- Press the button P1 to increase and P2 to decrease the value.
- Press P3 for confirmation

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **E5**

Confirm pressing **P3**.

## Function 05 – Opening frequency setting in Hz

- Hold the P3 until the display shows **01** e release P3
- Press repeatedly P2 until **05** appears on the display
- Press P3 the display shows **5.0** equal to the frequency set.
- Press the button P1 to increase and P2 to decrease the value
- Press P3 for confirmation.

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **E5**

Confirm pressing **P3**.

## Function 06 – Closing frequency setting in Hz

- Hold the P3 until the display shows **01** e release P3
- Press repeatedly P2 until **06** appears on the display
- Press P3 the display shows **5.0** equal to the frequency set.
- Press the button P1 to increase and P2 to decrease the value
- Press P3 for confirmation.

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **E5**

Confirm pressing **P3**.

Note:

| FACTORY SETTINGS                      | Min/Max | Pre-Set |      |      |
|---------------------------------------|---------|---------|------|------|
|                                       |         | PS      | PF   | PL   |
| Opening speed frequency in Hz         | 01 ÷ 99 | 50Hz    | 25Hz | 50Hz |
| Closing speed frequency in Hz         | 01 ÷ 99 | 50Hz    | 25Hz | 50Hz |
| Opening in slow speed frequency in Hz | 01 ÷ 99 | 25Hz    | 15Hz | 30Hz |
| Closing in slow speed frequency in Hz | 01 ÷ 99 | 25Hz    | 15Hz | 30Hz |

## Function 07 – Opening slowing down frequency setting in Hz.

- Hold the P3 until the display shows **01** e release P3
- Press repeatedly P2 until **07** appears on the display
- Press P3 the display shows **3.0** equal to the frequency set.
- Press the button P1 to increase and P2 to decrease the value
- Press P3 for confirmation.

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **E5**

Confirm pressing **P3**.

## Function 08 – Closing slowing down frequency setting in Hz

- Hold the P3 until the display shows **01** e release P3
- Press repeatedly P2 until **08** appears on the display
- Press P3 the display shows **3.0** equal to the frequency set.
- Press the button P1 to increase and P2 to decrease the value
- Press P3 for confirmation.

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **E5**

Confirm pressing **P3**.

## Function 09 – Amperometric sensitivity in Open from 01 to 99

- Hold the P3 until the display shows **01** e release P3
- Press repeatedly P2 until **09** appears on the display
- Press P3 the display shows **5.0** equal to the sensitivity set.
- Press the button P1 to increase and P2 to decrease the value

 To disable the control, set **0.0**

- **Note: id. 01= very sensitive – 99= less sensitive.**

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **E5**

Confirm pressing **P3**.

## Function 10 – Amperometric sensitivity in Close from 01 to 99

- Hold the P3 until the display shows **01** e release P3
- Press repeatedly P2 until **10** appears on the display
- Press P3, the display shows **5.0** equal to the sensitivity set.
- Press the button P1 to increase and P2 to decrease the value

 To disable the control, set **0.0**

- **Note: id. 01= very sensitive – 99= less sensitive.**

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **E5**

Confirm pressing **P3**.

## Function 11 – Amperometric sensitivity in slow Open from 01 to 99

- Hold the P3 until the display shows **01** e release P3
- Press repeatedly P2 until **11** appears on the display
- Press P3, the display shows **5.0** equal to the sensitivity set.
- Press the button P1 to increase and P2 to decrease the value

 To disable the control, set **0.0**

- **Note: id. 01= very sensitive – 99= less sensitive.**

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **E5**

Confirm pressing **P3**.

## Function 12 – Amperometric sensitivity in slow Close from 01 to 99

- Hold the P3 until the display shows **01** e release P3
- Press repeatedly P2 until **12** appears on the display
- Press P3, the display shows **5.0** equal to the sensitivity set.
- Press the button P1 to increase and P2 to decrease the value

 To disable the control, set **5.0**

- **Note: id. 01= very sensitive – 99= less sensitive.**

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **E5** Confirm pressing **P3**.

## Function 13 – Starting blow from 1 to 20 (tenths of a second)

- Hold the P3 until the display shows **01** e release P3
- Press repeatedly P2 until **13** appears on the display
- Press P3, the display shows **0.0** = Disabled.
- Set the time in tenths of a second
- Press the button P1 to increase and P2 to decrease the value. Ex. ( **1.0** )
- Press P3 for confirmation

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **E5**

Confirm pressing **P3**.

## Funzione 14 –Final blow after limit switch 1 to 20 (tenths of a second)

- Hold the P3 until the display shows **0 l** e release P3
- Press repeatedly P2 until **14** appears on the display
- Press P3, the display shows **0.0** = Disabled.
- Set the time in tenths of a second
- Press the button P1 to increase and P2 to decrease the value. Ex. ( **1.0** )
- Press P3 for confirmation

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **E5**  
Confirm pressing **P3**.

## Function 15 – Function test enabling

- Hold the P3 until the display shows **0 l** e release P3
- Press repeatedly P2 until **15** appears on the display
- Press P3, the display shows **0.0** = Disabled.
- Set the time of start delay in second
- Press the button P1 to increase and P2 to decrease the value of the start. Ex. (**3.0**)
- Press P3 for confirmation.

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **ES**  
Confirm pressing **P3**.

## Function 16 – Count Maneuvers.

- Hold the P3 until the display shows **0 l** e release P3.
- Press repeatedly P2 until **16** appears on the display
- Press P3 to view tens / units
- Press P2 for thousands / hundreds
- Press P2 for hundreds-thousands / tens-thousands
- Press P3 for confirmation.

**If you want to quit the programming mode follow the procedure for ESC:**

Press **P2** (Forward) or **P1** (Backward) until you see **E5**  
Confirm pressing **P3**.

## Dead man function setting **UP**

- Hold the P3 until the display shows **01** e release P3.
- Press repeatedly P2 until **UP** appears on the display
- Press P3 to confirm and select with P2 **Si** yes or **no**
- Press P3 to confirm the selection

## Dip Switch meaning

**Dip 1 ON** : automatic reclosure enabled

**Dip 1 OFF** : automatic reclosure disabled

**Dip 2 ON** : inversion on start during closing enabled

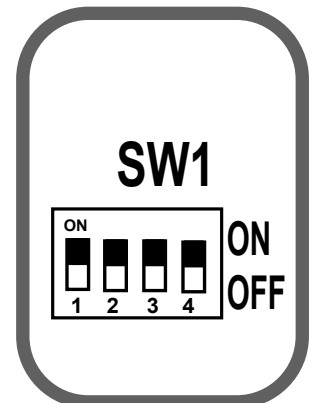
**Dip 2 OFF** : inversion on start during closing disabled

**Dip 3 ON** : does not accept start when opening and opened

**Dip 3 OFF** : accept start when opening and opened

**Dip 4 ON** :  Button works like open command

**Dip 4 OFF** : Button works like start command



## Possible Errors reported on LED DS1

**E1** Error 1.

**E2** Short circuit.

**E3** Setup FF failure.

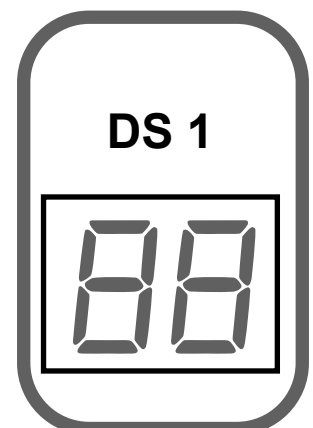
**E4** Capacitors charge failure.

**E5** High Temperature.

**E6** Instantaneous overcurrent.

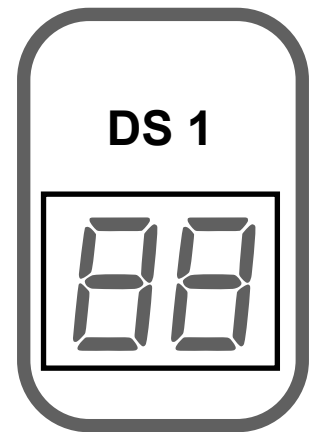
**E7** Delayed overcurrent..

**E8** Bus overvoltage.



## INDICATIONS ON DISPLAY DS1

|             |                                                                                                |
|-------------|------------------------------------------------------------------------------------------------|
| <b>CH</b>   | Door closed.                                                                                   |
| <b>CL</b>   | Door closing.                                                                                  |
| <b>OP</b>   | Door opening.                                                                                  |
| <b>AP</b>   | Door opened.                                                                                   |
| <b>EE</b>   | Self -learning.                                                                                |
| <b>St</b>   | Stop pressed.                                                                                  |
| <b>01</b>   | Three-phase motor 230Vac                                                                       |
| <b>02</b>   | Single-phase motor 230Vac                                                                      |
| <b>0.1.</b> | Sliding gate <b>0.2.</b> Fridge door <b>0.3.</b> Sectional door;<br>confirm with P3.           |
| <b>03</b>   | Regulation pause time:<br>P2 1 second increment,<br>P1 1 second decrement,<br>Confirm with P3. |
| <b>04</b>   | Max torque Display number of operation.                                                        |
| <b>05</b>   | Frequency regulation OPEN                                                                      |
| <b>06</b>   | Frequency regulation CLOSE                                                                     |
| <b>07</b>   | Frequency slowing down regulation OPEN                                                         |
| <b>08</b>   | Frequency slowing down regulation CLOSE                                                        |
| <b>09</b>   | Amperometric sensitivity Open                                                                  |
| <b>10</b>   | Amperometric sensitivity Close                                                                 |
| <b>11</b>   | Amperometric sensitivity slow Open                                                             |
| <b>12</b>   | Amperometric sensitivity slow Close                                                            |
| <b>13</b>   | Starting blow.                                                                                 |
| <b>14</b>   | Closing blow.                                                                                  |
| <b>15</b>   | Test.                                                                                          |
| <b>16</b>   | Count Maneuvers.                                                                               |
| <b>UP</b>   | Deadman only operation. If activated display <b>UP</b> .                                       |
| <b>ES</b>   | Press P3 to exit.                                                                              |



## DECLARATION OF CONFORMITY

The manufacturer claims that the device complies with the essential safety requirements of the directives:

- Radio equipment - **1999/5 / EC**;
- Low Voltage - **73/23 / EEC, 93/68 / EEC** (EN 60335-1 (1998));
- Electromagnetic Compatibility - **89/336 / EEC, 93/68 / EEC, 98/37 / EC** (EN 50081-1, EN 50081-2, EN 61000-3-2, EN 61000-3-2 / A1, EN 61000-3-2 / A2, EN 61000-3-2 / A14, EN 61000-3-3, EN 61000-6-2, ETSI EN 300220-3, ETSI EN 301489-3, ETSI EN 301489-1)

As well as their changes and updates, and the provisions that implement their assimilation within the National Legal System of the country of destination and use of the car.

The data and images are purely indicative reserves the right to modify at any time characteristics of the products described in its sole discretion, without notice.



***The data and images are for guidance only  
reserves the right to change at any time characteristics of the products described in  
its sole discretion, without notice.***

CONTACTS :



Via Circolare p.i.p. N° 10  
65010 Santa Teresa di Spoltore (PE) - ITALY  
Tel. +39 085 4971946 - FAX +39 085 4973849  
[www.vdsautomation.com](http://www.vdsautomation.com) - [info@vdsautomation.com](mailto:info@vdsautomation.com)