

## SMART EVO 2 - User Manual

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*ELECTRICAL PANEL FOR 2 MOTORS*



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## 1. INTRODUCTION

This manual must always accompany the relevant equipment and be conserved in an accessible location for consultation by qualified technicians assigned for operation and maintenance of the system.

The installer/user is strongly recommended to carefully read all instructions and information in this manual before using the product, in order to avoid damage or improper use of the unit, which would also render the warranty null and void.

Before operating the equipment, carefully read the manual and follow all instructions provided.

The information and instructions in this manual refer to the standard use of this product; in the event of special circumstances, functions or applications not described in this document, contact our service center for assistance.

If technical assistance or spare parts are required, when contacting the manufacturer always specify the identification code of the model and construction number as stated on the data plate.

Our service center is available for any requirement or clarification.

On receipt of the goods, inspect immediately to ensure that the equipment has not been damaged during transport. If defects are found, the client should promptly notify our retailer within 5 days of receiving the goods, or in the event of direct purchases, the Elentek service center.



**N.B.** the information provided in this manual is subject to modifications without notice. The manufacturer shall not be held liable for any damage caused in relation to the use of these instructions, as they are to be considered guideline only. Note that failure to observe the instructions provided in this manual may cause physical injury or damage to objects.

In any event all local and/or current legislation must be observed at all times.

## 2. WARNINGS



The electrical panel must be used exclusively for the purpose and function as specified in design. Any other application or use is to be considered improper and therefore hazardous.

In the event of a fire in the place of installation or the surrounding area, avoid the use of water jets and use the appropriate extinguishing equipment and means (powder, foam, carbon dioxide).

Install the equipment far from heat sources and in a dry and sheltered location in observance of the stated protection rating (IP).

The installation of a safety device is recommended to protect the panel power line in compliance with current electrical standards.

The electrical panel must be connected by a qualified electrician in observance of the relevant electrical standards.

No parts of the panel must be disassembled without the official authorization of Elentek: any tampering with or modifications to the unit will render all terms of the warranty null and void.

All installation and/or maintenance operations must be performed by a specialized technician who is fully aware of the relevant current safety standards.

Ensure the installation is connected to an efficient earthing system.

After making the electrical connection, check that all electrical panel settings are correct to avoid automatic start-up of the electric pump.

Elentek declines all liability in the event of the following:

- Incorrect installation;
- Use by personnel not adequately trained in the correct use of the panel;
- Serious failure to perform scheduled maintenance;
- Use of non-original spare parts or parts not specific to the model;
- Unauthorized modifications or interventions;
- Partial or total failure to observe instructions.

### 3. GENERAL DESCRIPTION

- Single phase power supply 100-240Vac 50/60Hz (SMART EVO 2-Mono);
- Three phase power supply 100-240Vac or 310-450Vac 50/60Hz (SMART EVO 2 -Tri);
- G/P1 and G/P2 normally open inputs for start-up command;
- 3 inputs for single-pole level sensors (COM-MIN-MAX);
- T1 and T2 inputs for motor clicson;
- G.A. normally open input for alarm activation;
- AUTOMATIC-0-MANUAL buttons (spring return);
- DIP-SWITCH 1 level alarm enable from sensors;
- DIP-SWITCH 2 thermal cut-out activation delay 5/10 seconds;
- DIP-SWITCH 3 alarm output settings;
- DIP-SWITCH 4 alarm reset enable from motor clicson;
- DIP-SWITCH 5 for Filling/Emptying mode;
- DIP-SWITCH 6 start/stop float enable;
- DIP-SWITCH 7 enable of delay on board activation on power mains return;
- DIP-SWITCH 8 motor switching module enable;
- Green led: power ON / failure or incorrect phase sequence
- 2 green leds: automatic mode enabled;
- Green led: motor active;
- Red led: level alarm from sensors or GA input;
- 2 Red leds: motor overload alarm/minimum current alarm;
- 2 red leds: motor clicson activation alarm;
- Electronic control of maximum current due to overload, with assisted calibration;
- Electronic control of minimum current due to dry run, with assisted calibration;
- Automatic reset due to minimum current alarm;
- Protections of aux. circuits and motor with fuses;
- Cumulative alarm output with voltage-free contacts (COM-NO-NC resistive load - 5A / 250V);
- Cumulative alarm output, live (12Vcc / 100mA);
- Door lock general disconnect switch;
- Provision for start-up capacitors, single phase version (not included);
- Box in ABS, IP55;
- Ambient temperature: -5/+40 °C;
- Relative humidity 50% at 40 °C (condensate free).

## 4. INSTALLATION

**Ensure that the mains power supply specifications correspond to the voltage specified on the data plate of the electrical panel and motor connected, then make the earthing connection before all other connections.**

SMART EVO 2-Mono	▶	1~100-240Vac 50/60Hz
SMART EVO 2-Tri	▶	3~100-240Vac o 3~310-450Vac 50/60Hz

The power line must be protected by a residual current circuit breaker.

Tighten the electrical cables on the relative terminals using a suitable tool correctly sized to avoid the risk of damage to the fixing screws. Take care if using an electric screwdriver.

The electrical panel is designed for wall-mounting using screws and plugs in the pre-drilled holes at the corners of the enclosure, or by means of brackets when present.

Install the equipment in areas compliant with the protection rating and ensure that the box is kept intact when drilling the holes for fitting the cable clamps.

Avoid the use of multicore cables where there are wires connected to inductive loads and power cables and signal cables such as sensors and digital inputs.

Keep connection cables as short as possible, preventing any twisting of cables which may be harmful due to inductive effects on the electronic equipment.

All wires used in the cabling must be suitably sized to withstand the load to be powered.



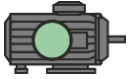
## 5. LUMINOUS INDICATORS AND COMMANDS



STEADY green led mains power ON

FLASHING green led failure or incorrect phase sequence

Green led OFF device not powered;



STEADY green led electric pump operating

QUICK FLASHING green led (1 second) minimum current control enabled

Green led OFF electric pump on standby



STEADY red led motor thermal cut-out trip

SLOW FLASHING red led minimum current alarm

QUICK FLASHING red led (1 second) minimum current control disabled



STEADY red led level alarm from sensor input

FLASHING red led alarm from GA input



STEADY red led motor temperature overload alarm with manual reset

FLASHING red led motor temperature overload alarm with automatic reset

AUT button automatic mode

AUT button for alarm reset (when pressed for 2 seconds)



STEADY green led automatic mode active

SLOW FLASHING green led motor current calibration mode (Min/Max)

Green led OFF automatic mode disabled



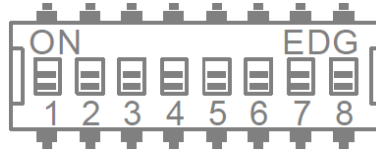
0 button motor operation stop or standby



MAN button manual mode

## 6. DIP-SWITCH SETTINGS

Set DIP-SWITCHES with the panel switched off.



### 6.1 DIP-SWITCH 1 - Level alarm

<b>OFF</b> ↓	Level alarm from sensor input disabled
<b>ON</b> ↑	Level alarm from sensor input enabled

DIP-SWITCH 1 enables the display on the panel, signaling on the voltage-free contact alarm output and signaling on the live alarm output of the level alarm from the inputs COM-MIN-MAX.

In emptying mode with single-pole sensors, the minimum level alarm trips if inputs COM-MIN-MAX are open (COM-MAX if a float is used).

In filling mode with single-pole sensors, the maximum level alarm trips if inputs COM-MIN-MAX are closed (COM-MAX if a float is used).

### 6.2 DIP-SWITCH 2 - Thermal cut-out trip delay

<b>OFF</b> ↓	Delay of motor thermal cut-out activation by 5 seconds
<b>ON</b> ↑	Delay of motor thermal cut-out activation by 10 seconds

DIP-SWITCH 2 enables selection of the thermal cut-out activation delay time of 5 or 10 seconds.

The setting of this parameter prevents activation of the overload thermal cut-out during motor start-up, thereby avoiding a start-up current.

### 6.3 DIP-SWITCH 3 - Alarm output

<b>OFF</b> ↓	In the case of any tripped alarm, the relay output and 12 Vdc output are activated
<b>ON</b> ↑	In the case of any tripped alarm, the relay output is activated In the case of a GA alarm, the relay output and 12 Vdc output are activated

DIP-SWITCH 3 enables separation of the voltage-free contact alarm output and live alarm output for the GA input.

If set to “0”, in the case of any alarm, both the voltage-free contact alarm output and live alarm output are activated.

If set to “1”, in the case of any alarm, the voltage-free contact alarm output is activated while the live alarm output is only activated for the GA input.

### 6.4 DIP-SWITCH 4 - Motor temperature overload alarm reset

<b>OFF</b> ↓	Motor temperature overload alarm with manual reset
<b>ON</b> ↑	Motor temperature overload alarm with automatic reset

DIP-SWITCH 4 enables selection of whether the motor temperature overload alarm activated by the T1 clicson input must be reset manually, by keeping the AUT button pressed, or in automatic mode.

## 6.5 DIP-SWITCH 5 - Emptying / Filling

<b>OFF</b> ↓	Level sensor operation in filling mode only
<b>ON</b> ↑	Level sensor operation in emptying mode only

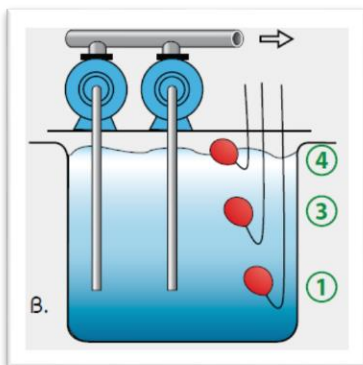
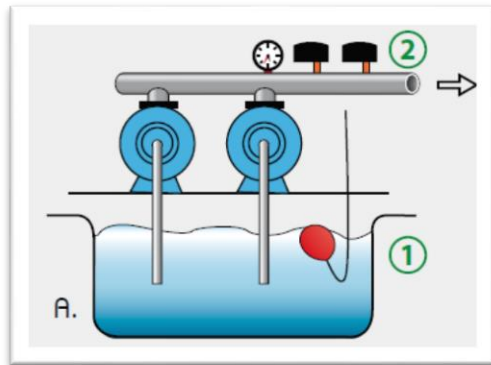
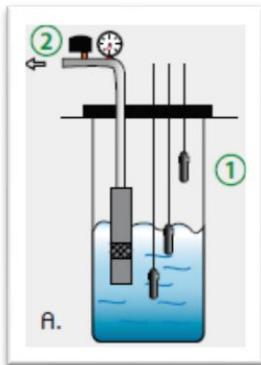
DIP-SWITCH 5 enables selection of whether to use the sensor inputs COM-MIN-MAX. in emptying or filling mode.

### 6.5.1 Emptying

In emptying mode, the input is used to enable the system when water is present.

The inputs COM-MIN-MAX must be closed to enable the system.

If a float type on/off command is used instead of single pole sensors, the inputs COM-MAX must be closed.



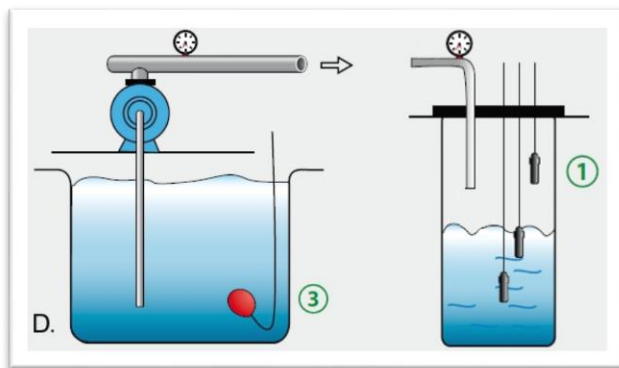
- ① Level sensors/minimum level float switch.
- ② Start pressure switch.
- ③ Minimum level float switch.
- ④ Start float switch.

### 6.5.2 *Filling*

In filling mode, the input is used to enable the system when water is not present.

The inputs COM-MIN-MAX must be open to enable the system.

If a float type on/off command is used instead of single pole sensors, the inputs COM-MAX must be closed.



① *Level probes.*

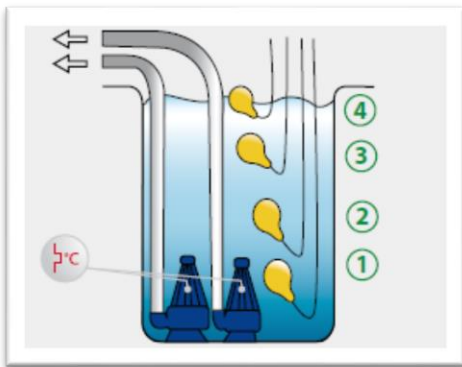
③ *Minimum level float switch.*

## 6.6 DIP-SWITCH 6 - Start/stop floats switch

<b>OFF</b> ↓	Start/stop float disable
<b>ON</b> ↑	Start/stop float enable

DIP-SWITCH 6 enables operation of the start-stop float mode.

For this setting, the minimum level/stop float must be connected to the inputs COM-MAX and the start float to G/P1.



- ① *Min. level/Stop float switch.*
- ② *Alternation float switch.*
- ③ *Emergency float switch.*
- ④ *Alarm float switch.*

## 6.7 DIP-SWITCH 7 - Enable of delayed board activation on power mains return

<b>OFF</b> ↓	Disable of board delay on power supply failure
<b>ON</b> ↑	Delayed board activation on power supply failure

DIP-SWITCH 7 enables delayed board activation in the event of an electrical power supply failure.

On return of power, the board enables the inputs and outputs after a delay interval of 30 seconds.



**N.B.** after a power supply failure, the panel is reactivated maintaining the previous AUT 0 MAN status. If the system is set with automatic mode disabled, on each subsequent reactivation after a power failure, it will remain disabled, or vice versa.

## 6.8 DIP-SWITCH 8 - Switching module enable

<b>OFF</b> ↓	Switching module disable
<b>ON</b> ↑	Switching module enable

DIP-SWITCH 8 enables automatic switching of the motors.

When enabled, this function means that on each call from input G/P1 the motor outputs are activated alternately and, in the event of a call from input G/P2 at the same time, both motors will be operated.

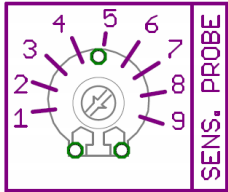
When enabled, the switching module alternates the motor on each call from input G/P1 and also switches motors in the event of:

- **current overload of a motor**
- **motor set to standby**
- **Lack of water on subsequent automatic reset**

If direct control of the motors is required, deactivate the switching module so that G/P1 directly and independently controls the output of motor 1 and G/P2 directly and independently controls the output of motor 2.

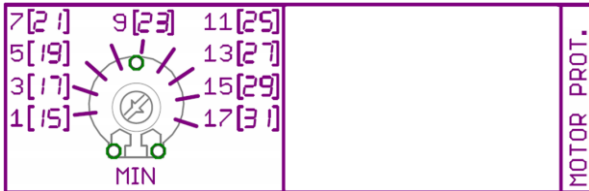
## 7. TRIMMER SETTINGS

### 7.1 TRIMMER SENS. PROBE - Probe sensitivity



The trimmer “SENS. PROBE” can be used to adjust sensitivity of the sensors to adapt them to conductivity of the liquid. This value should therefore be increased in the case of liquids with low conductivity.

### 7.2 TRIMMER MIN - Activation on minimum current



The “MIN” trimmer enables adjustment of the minimum motor current for protection against the risk of dry running, for added protection or when minimum level floats or sensors are not required.

When enabled, this parameter enables automatic reactivation if no water is present, with automatic reset every 2 minutes on the first 15 attempts, and then repeated attempts every 5 minutes.

To access assisted calibration mode, press and hold the button “0” of motor 1 during power-up of the panel, and the green led on the “AUT” button will start to flash.

Start up the motor using the “MAN” button and rotate the trimmer clockwise (starting from 1A), until the green led indicating pump operation turns on.

However, the control can be disabled by turning the trimmer to minimum.

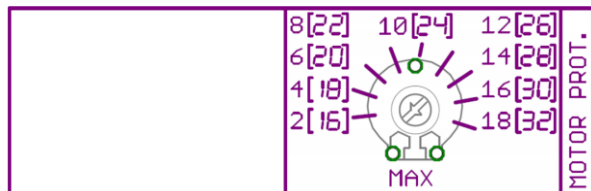
On deactivation, the red led indicating motor thermal cut-out starts flashing quickly for 1 second.



**N.B.** To calibrate the minimum current, the motor must be started up with water present.



### 7.3 TRIMMER MAX - Activation on current overload



The "MAX" trimmer enables adjustment of the maximum motor current, over which the system protection trips due to current overload.

The maximum current can be adjusted in two ways:

- Nominal motor current.
- Automatic calibration.

#### 7.3.1 *Nominal motor current*

If the nominal motor current is known, set a value higher by approx. 15%, according to the screen printing of the board.

#### 7.3.2 *Automatic calibration*

Press and hold the button "0" of motor 1 during power-up of the panel, and the green led on the "AUT" button will start to flash.

Start up the motor using the "MAN" button and rotate the trimmer clockwise (starting from 2A), until the red thermal cut-out led turns on.

When lit, the red led indicates that the set current is 15% higher than the current absorbed by the motor.



N.B. To calibrate the maximum current, the motor must be started up with water present.

The current scale is proportional to the power of the control panel:  
1 to 18 Ampere or 15 to 32 Ampere.



#### **CAUTION!**

**Always calibrate the trimmer in observance of the maximum current specified on the electrical panel.**

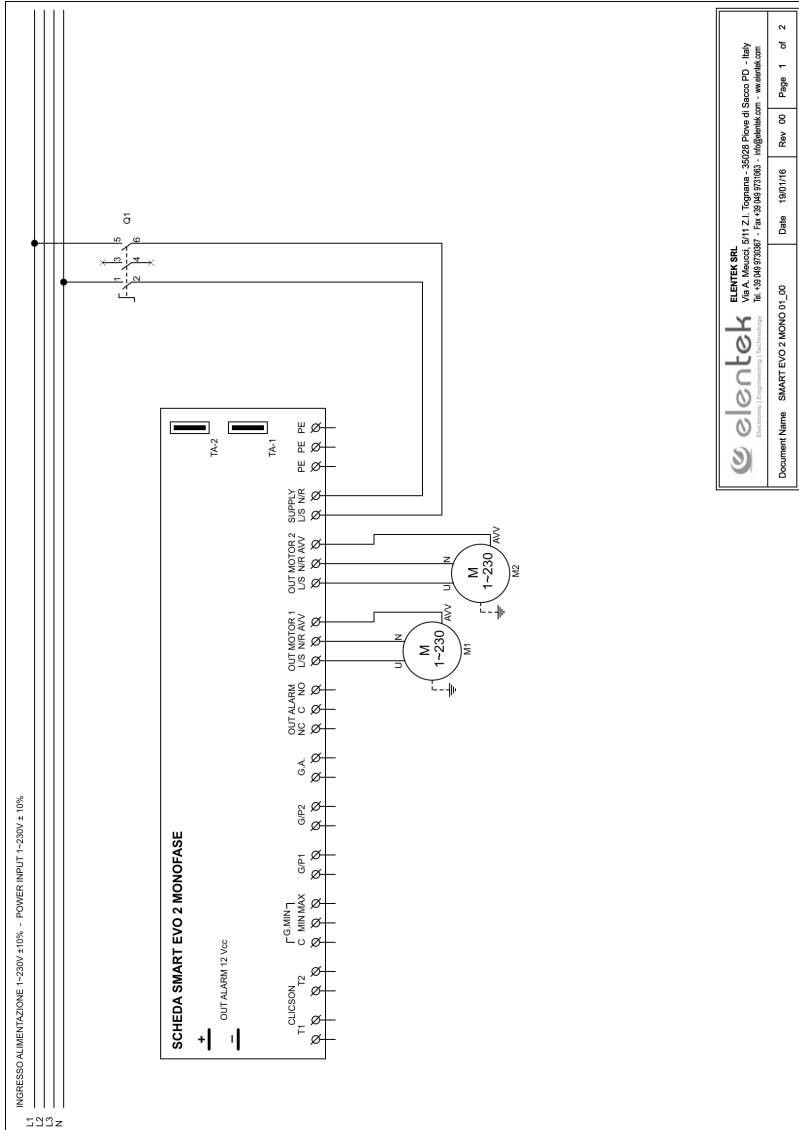
**Exceeding the maximum specified threshold will automatically render the warranty null and void.**

## 8. BOARD SPECIFICATIONS

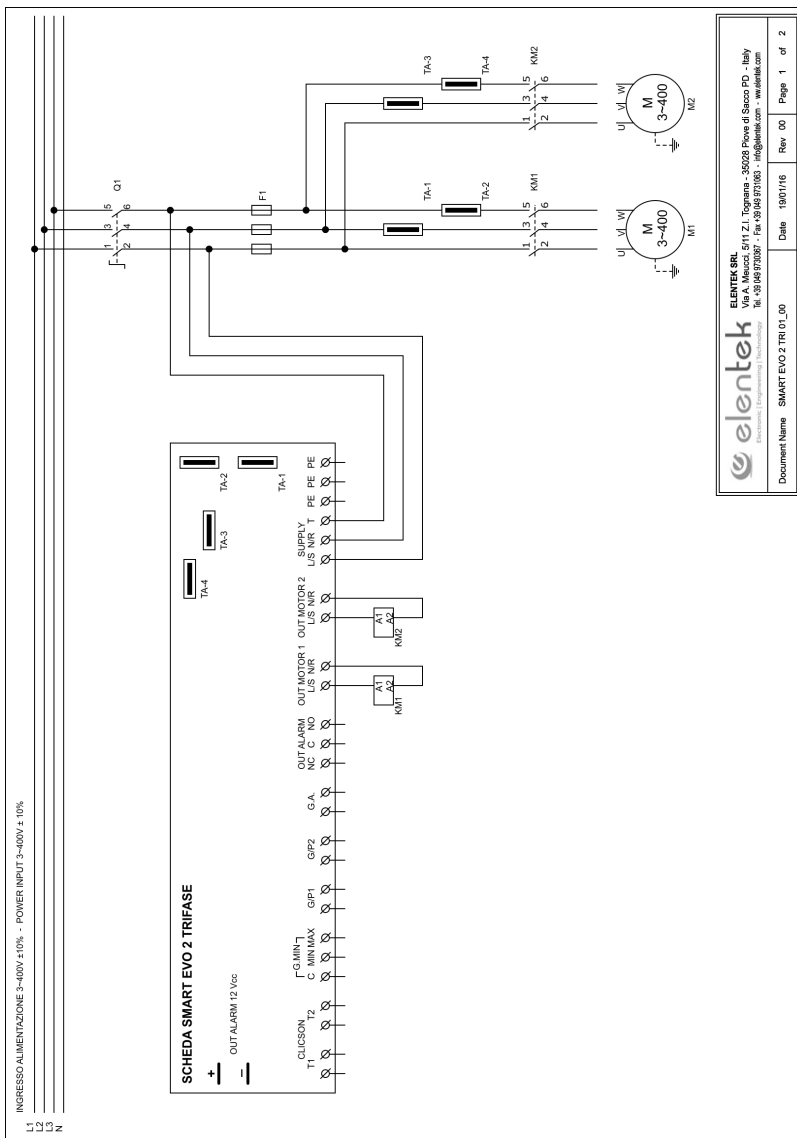


# 9. STANDARD CIRCUIT DIAGRAMS

## 9.1 SMART EVO 2 Single phase (230V) circuit diagram



9.2 SMART EVO 2 Three phase (400V) circuit diagram

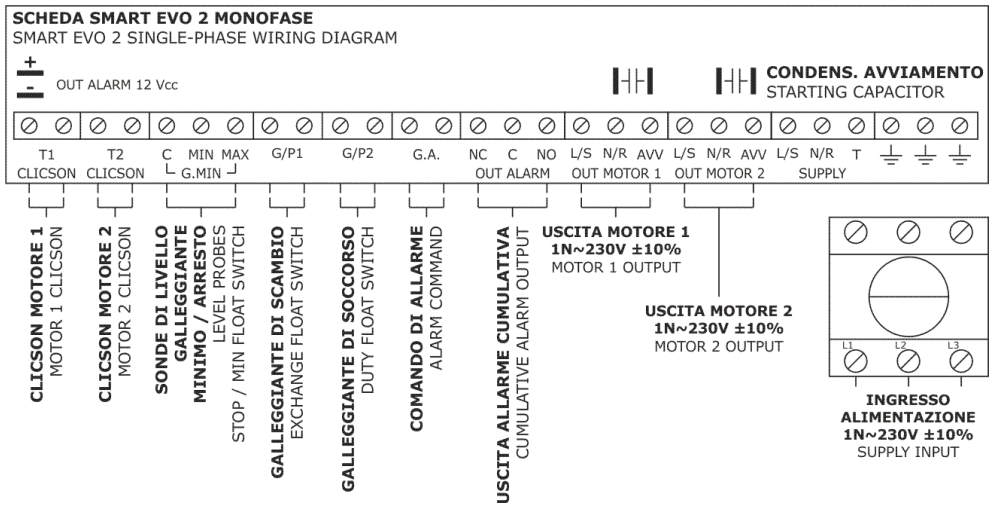


**NOTE:** On the three phase 230V version, the power supply and motors must be 3~230V.

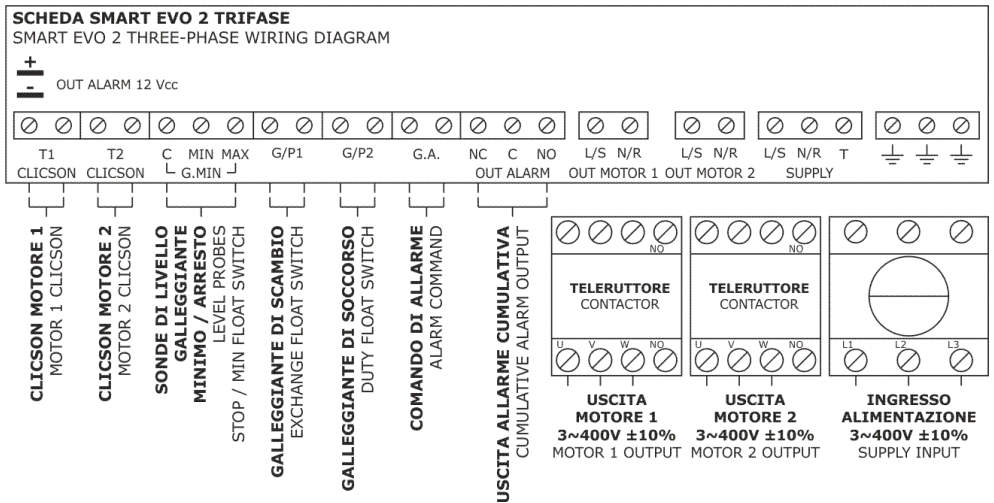


## 10. STANDARD WIRING DIAGRAMS

### 10.1 SMART EVO 2 Single phase (230V) wiring diagram



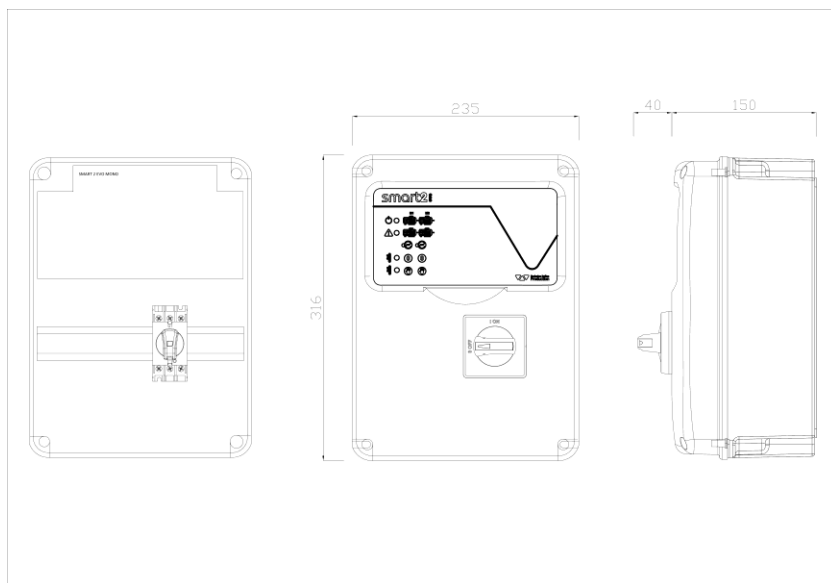
### 10.2 SMART EVO 2 Three phase (400V) wiring diagram



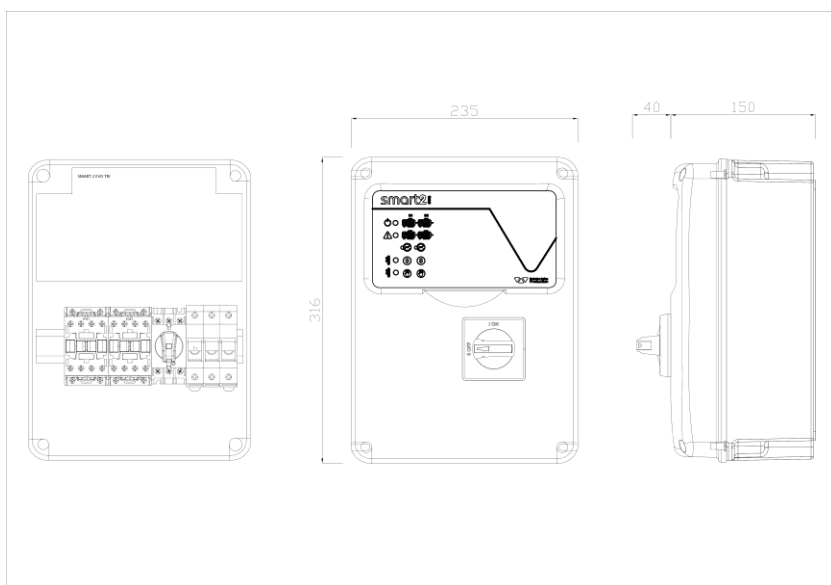
**NOTE:** On the three phase 230V version, the power supply and motors must be 3~230V.

## 11. STANDARD DIMENSIONAL DIAGRAM

### 11.1 SMART EVO 2 Single phase dimensional



### 11.2 SMART EVO 2 Three phase dimensional



## 12. TROUBLESHOOTING

	PROBLEMA	VERIFICHE / SOLUZIONI
1.	THE PANEL IS POWERED UP BUT DOES NOT START UP IN AUTOMATIC MODE.	<ul style="list-style-type: none"> <li>• Check that the green led on the automatic mode button is lit; otherwise press the button.</li> </ul>
2.	THE PANEL IS SET TO AUTOMATIC MODE BUT THE PUMP DOES NOT START.	<ul style="list-style-type: none"> <li>• Ensure that inputs "G/P1", "G/P2" and "COM-MIN-MAX" are closed.</li> <li>• Ensure correct operation of the floats.</li> <li>• Check that the normally open inputs are closed.</li> <li>• On the single phase model, check that the 230V~ voltage is present on the motor output terminals "L/S" and "N/R"; on the three-phase model check that the 400V~ voltage is present on terminals "L/S" and "N/R" and that the contactor winding is powered.</li> <li>• Check settings of the DIP-SWITCHES (see page 10).</li> </ul>
3.	ON START-UP OF THE PUMP, THE THERMAL CUT-OUT TRIPS	<ul style="list-style-type: none"> <li>• Check the setting of the MAX trimmer or that the set current is approx. 15% higher with respect to the nominal motor current (see page 16).</li> <li>• Check that the thermal cut-out activation delay is sufficient on DIP SWITCH 2.</li> </ul>
4.	THE THERMAL CUT-OUT DOES NOT TRIP.	<ul style="list-style-type: none"> <li>• Check the setting of the MAX trimmer or that the set current is approx. 15% higher with respect to the nominal motor current (see page 16).</li> </ul>
5.	THE LIVE OUTPUT DOES NOT DELIVER 12 VDC	<ul style="list-style-type: none"> <li>• Check that the GA input closes in the event of an alarm.</li> <li>• Check settings of DIP-SWITCH 3.</li> </ul>
6.	THE PANEL IS IN MOTOR TEMPERATURE OVERLOAD ALARM STATUS	<ul style="list-style-type: none"> <li>• Check that jumpers are wired in on the motor clicson inputs "T1" and "T2" if the pumps are not fitted with a thermal cut-out.</li> <li>• Check settings of DIP-SWITCH 4.</li> </ul>
7.	NO LED LIGHTS UP ON THE CONTROL PANEL.	<ul style="list-style-type: none"> <li>• Check that the FLAT connector is inserted correctly.</li> <li>• Ensure that the door lock is set to ON.</li> <li>• On the panel input, check that the voltages 230V~ or 400V~ are present between the mains input terminals "SUPPLY".</li> <li>• Check that the fuses are efficient.</li> </ul>

## 13. GENERAL CONDITIONS

### 13.1 Warranty

The product warranty is subject to the general terms of sale of the company Elentek S.r.l.

Acknowledgement of the warranty depends on the strict and proven observance of the operating instructions in this booklet and application of the correct mechanical, hydraulic and electro-technical practices.

All products are covered by a warranty valid for 12 months, which covers all construction defects of our products and includes the replacement/repairs of defective parts.

The warranty will not be deemed valid in the event of:

- tampering with the panel (modifications without prior authorization);
- faults due to lack of or inadequate protection and/or connection errors;
- faults caused by exceeding data plate specifications;
- normal wear and tear of the panel;
- failure by installation personnel to observe the specified operating procedures;
- accidental causes, natural disasters of any kind, such as fires, flooding, water or lightning;

The defective material must be delivered carriage paid to Elentek S.r.l., who reserves the right to final judgement of the cause of the said defects.

The Warranty applies exclusively to restoring the original product characteristics and does not cover material damage or physical injury.

### 13.2 Maintenance

SMART EVO 1 does not require routine maintenance provided that it is used within the operating limits and in observance of the instructions in this manual.

Special maintenance or repairs must be performed exclusively by authorized service centers.

In the event of repairs, only original spare parts must be used.

The manufacturer declines all liability for material damage or injury to persons or animals caused by maintenance interventions performed by unauthorized personnel or using non-original materials.

### 13.3 Disposal

In the event of disassembly and scrapping, strictly observe local legislation regarding pollution.

Waste disposal according to material categories is recommended.





## 14. DECLARATION OF CONFORMITY



ELENTEK Srl with registered offices in via A. Meucci, 5/11 - 35028 Piove di Sacco (PD) ITALIA, declares under its sole responsibility that the machine:

### SMART EVO series

installed and used in the ways and for the purposes described in the operation and instruction manual complies with the provisions of the EU directives and relative amendments:

- ❖ European Directive 2014/35 UE
- ❖ Electromagnetic Compatibility 2014/30 UE and subsequent amendments, in compliance with the following technical standards:
  - EN 61439-1
  - EN 61000-3-2
  - EN 55014-1
  - EN 61000-3-3

Piove di Sacco, 01.02.2016

LEGAL REPRESENTATIVE



Michele Borgato







**ISO 9001**

**ELENTEK SRL SOCIETÀ UNIPERSONALE**

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*Em. 02.2016*