

## **EXPRESS - User Manual**

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*MULTIFUNCTION ELECTRICAL PANEL FROM 1 TO 4 MOTORS*



# CONTENTS

<b>1.</b>	<b>INTRODUCTION.....</b>	<b>5</b>
<b>2.</b>	<b>WARNINGS .....</b>	<b>6</b>
<b>3.</b>	<b>INSTALLATION.....</b>	<b>7</b>
<b>4.</b>	<b>CONTROL PANEL .....</b>	<b>8</b>
4.1	<i>Main display items.....</i>	<i>9</i>
4.2	<i>Activation of load in manual mode.....</i>	<i>10</i>
<b>5.</b>	<b>MOTHERBOARD INPUTS AND OUTPUTS .....</b>	<b>11</b>
<b>6.</b>	<b>EXTENSION INPUTS AND OUTPUTS .....</b>	<b>12</b>
<b>7.</b>	<b>FUNCTIONS AND SETTINGS .....</b>	<b>13</b>
7.1	<i>FUNCTION 1 - Draining with floats/pressure switches.....</i>	<i>13</i>
7.2	<i>FUNCTION 2 - Draining with level sensors and floats/pressure switches.....</i>	<i>15</i>
7.3	<i>FUNCTION 3 - Drainage with “COS-PHI” power factor .....</i>	<i>17</i>
7.4	<i>FUNCTION 4 - Control with analogue signal and floats/pressure switches .....</i>	<i>20</i>
7.5	<i>FUNCTION 5 - Control with analogue signal and level sensors .....</i>	<i>22</i>
7.6	<i>FUNCTION 6 - Control with analogue signal and “COS-PHI” power factor .....</i>	<i>24</i>
7.7	<i>FUNCTION 7 - Filling with level sensors and floats/pressure switches.....</i>	<i>27</i>
7.8	<i>FUNCTION 8 - Filling with level sensors and “COS-PHI” power factor.....</i>	<i>29</i>
<b>8.</b>	<b>ALARMS .....</b>	<b>32</b>



# 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 producer 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 the producer: 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.

The producer 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. 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.**

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.

## 4. CONTROL PANEL

The EXPRESS electrical panel has been designed for settable protection of 1 to 4 motors with the option of selecting the operating mode according to the specific system used.

Among the various modes, the panel enable motor control by means of:

- pressure switches;
- floats;
- remote contacts;
- start/stop floats;
- level sensors;
- 0-10V signals;
- 4-20mA pressure transducers;
- "COS-PHI" power factor (where "*Phi*" is the timing angle between current and voltage).



Display of values and programming



Red led: general alarm



SETUP (or multifunction) button



UP arrow button



DOWN arrow button



OK button



## 4.1 Main display items

On activation of the panel, the display shows the following:



At the end of the start-up sequence, the main menu is displayed, as described below.



**MAIN SCREEN:** This screen enables the display of active motors, voltage on input and total absorption of the panel:

- 230 V = Power supply voltage reading;
- 7.0 A tot = Total current absorbed by the panel;
- P1 ( 0 ) = Motor 1 deactivated;          P1 ( 1 ) = Motor 1 active;
- P2 ( 0 ) = Motor 2 deactivated;          P2 ( 1 ) = Motor 2 active;
- P3 ( 0 ) = Motor 3 deactivated;          P3 ( 1 ) = Motor 3 active;



If operating modes are used with analogue signals, the main screen also displays the input signal expressed as a percentage, in metres or bar.



**MOTOR SCREEN:** By pressing **SETUP** the user can view the screen of each motor (P1, P2 and P3), where the following is displayed:

- 230 V = Power supply voltage reading;
- 0.0 A = Current absorbed by connected load;
- 1.0  $\varphi$  = Power factor of connected load;
- MAN (\*) = Panel set to manual mode;
- AUT (\*) = Panel set to automatic mode;
- MAN ( ) AUT ( ) = Panel on standby;
- P1 = Motor 1 deactivated;
- P1 = Motor 1 active;

## 4.2 Activation of load in manual mode

On start-up, the panel starts in automatic mode, as confirmed by the asterisk (\*) displayed alongside the text *AUT* on the display of each motor, or according to the previous status set before shutdown.

The operating mode can be changed by pressing the **UP** arrow to change to Manual mode, or the **DOWN** arrow to change to Automatic mode.

Therefore, to enable operation in Manual mode, press the **UP** arrow (the asterisk (\*) is displayed alongside the text *MAN*) and then press and hold **OK**.


The display then displays current absorption of the motor and the cos-phi power factor values in real time.

On release of the **OK** button, the motor is shut down.




**N.B.** in manual mode, the load is activated and bypasses all alarms, but in the event of a faulty the display flashes.

## 5. MOTHERBOARD INPUTS AND OUTPUTS

<b>I1 - C</b>	Normally open input for motor klicson (thermal protection on motor temperature overload).
<b>SH - C - C - SL</b>	<p>General enabling input for:</p> <ul style="list-style-type: none"> <li>- Unipolar level probes;</li> <li>- Minimum level float (connection between SH/SL and C).</li> </ul> <p><b>N.B.: CHECK THE CONNECTION DIAGRAM BASED ON THE SELECTED OPERATING LOGIC.</b></p>
<b>A - B</b>	<p>Multi-function digital/analogue input:</p> <ul style="list-style-type: none"> <li>- Normally open input for motor activation from pressure switch or operating float;</li> <li>- Analogue 4-20 mA input (terminal A = positive / terminal B = negative);</li> <li>- Analogue 0-10 V input (terminal A = negative / terminal B = positive).</li> </ul> <p><b>N.B.: CHECK THE CONNECTION DIAGRAM BASED ON THE SELECTED OPERATING LOGIC.</b></p>
<b>I2 - C</b>	Normally open input for alarm activation.
<b>OUT ALARM (NC - C - NA)</b>	<p>Cumulative alarm output with voltage-free alarm contacts (resistive load 5A - 250V) for:</p> <ul style="list-style-type: none"> <li>- Motor alarm ... dry running.</li> <li>- Motor alarm ... protection.</li> <li>- Motor alarm ... thermal overload.</li> <li>- Low voltage alarm.</li> <li>- Overvoltage alarm.</li> <li>- Sequence or no-phase alarm.</li> <li>- Max. level alarm.</li> <li>- Motor alarm ... communication.</li> <li>- Min. level alarm.</li> </ul>
<b>OUT MOTOR</b>	<p>SINGLE-PHASE:</p> <ul style="list-style-type: none"> <li>• L/S – Motor phase</li> <li>• N/R – Motor neutral</li> <li>• AVV – Start-up with on board capacitor</li> </ul> <p>THREE-PHASE:</p> <ul style="list-style-type: none"> <li>• T1 (contactor) – Motor U phase</li> <li>• T2 (contactor) – Motor V phase</li> <li>• T3 (contactor) – Motor W phase</li> </ul>
	Earth.

## 6. EXTENSION INPUTS AND OUTPUTS

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I2 - C	Normally open input for motor klicson (thermal protection on motor temperature overload).
I1 - C	Normally open input for motor activation from pressure switch or operating float. <b>N.B.: CHECK THE CONNECTION DIAGRAM BASED ON THE SELECTED OPERATING LOGIC.</b>
<b>OUT MOTOR</b>	SINGLE-PHASE: <ul style="list-style-type: none"><li>• L/S – Motor phase</li><li>• N/R – Motor neutral</li><li>• AVV – Start-up with on-board capacitor</li></ul> THREE PHASE: <ul style="list-style-type: none"><li>• T1 (contactor) – Motor U phase</li><li>• T2 (contactor) – Motor V phase</li><li>• T3 (contactor) – Motor W phase</li></ul>
	Earth.

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## 7. FUNCTIONS AND SETTINGS

The EXPRESS panel features a host of internal functions.

There are basically 8 operating modes developed for various types of application as described below.

### 7.1 FUNCTION 1 - Draining with floats/pressure switches

This operating mode is used for drainage applications using floats or pressure switches, enabling the control of one or more pumps.

On selection of mode 1, all relative parameter fields for this function are enabled.

#### 7.1.1 Programming menu

To select the panel operating logic, access the programming menu by pressing the buttons **SETUP**, **UP** and **DOWN** at the same time on the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<b>LANGUAGE</b> 0=ITA / 1=ENG / 2=FRA / 3=ESP / 4=GER	0 - 4
<b>WORKING MODE SETTING</b>	1
<b>NUMBER OF PUMPS</b> This parameter enables selection of the number of pumps in the system (when 1 single pump is selected, the parameters PUMP ROTATION ENABLED and FLOAT START/STOP FUNCTION are disabled. For the START / STOP to 1 single pump attach the float start between C-SH and the float stop between C-SL).	1 - 4
<b>PUMP ROTATION ENABLED</b> This parameter enables activation of pump exchange on each demand from floats or pressure switches. Also, if the main pump thermal cutout (current overload) trips, the second pump is enabled (if set to N, parameter START/STOP is disabled).	Y or N
<b>FLOAT START/STOP FUNCTION (self-holding).</b> This parameter enables deactivation of active pumps only on opening of the G.MIN. contact (min. level/stop float). This function is only available when pump rotation is enabled.	Y or N
<b>MINIMUM LEVEL ALARM OUTPUT</b> This parameter enables removal of the minimum level alarm from the cumulative alarm output.	Y or N

### 7.1.2 User menu

On completion of panel operation programming, enter the setup menu to configure the various data for motor start-up.

To access the user menu, press the button **SETUP** for 4 seconds in the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<p><b>MINIMUM VOLTAGE</b></p> <p>Set by default at -10% .</p> <p><i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i></p>	<p>207 (230)</p> <p>360 (400)</p>
<p><b>MAXIMUM VOLTAGE</b></p> <p>Set by default at +10% .</p> <p><i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i></p>	<p>253 (230)</p> <p>440 (400)</p>
<p><b>MAXIMUM CURRENT P1 / P2 / P3 / P4</b></p> <p>This parameter enables entry of the maximum current for each motor.</p> <p>Enter the maximum current value, increasing it by 10-15% with respect to the rated motor value.</p> <p><i>Modifications to operating limits beyond the parameters stated on the model data plate will immediately render the warranty null and void.</i></p>	<p>1 - ... A</p>
<p><b>DISPLAY BRIGHTNESS ON STANDBY</b></p> <p>This parameter enables entry of the brightness setting applied when the display sets to standby (wait 9 seconds for a preview).</p>	<p>0 - 9</p>
<p><b>TIME FOR ENTRY TO SET-UP</b></p> <p>This parameter enables entry of the time to keep the SETUP button pressed for access to the set-up menu.</p>	<p>2 - 30 Sec</p>

## 7.2 FUNCTION 2 - Draining with level sensors and floats/pressure switches

This operating mode is used for drainage applications using level sensors and floats or pressure switches, enabling the control of one or more pumps.

On selection of mode 2, all relative parameter fields for this function are enabled.

### 7.2.1 Programming menu

To select the panel operating logic, access the programming menu by pressing the buttons **SETUP**, **UP** and **DOWN** at the same time on the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<b>LANGUAGE</b> 0=ITA / 1=ENG / 2=FRA / 3=ESP / 4=TED	0 - 4
<b>WORKING MODE SETTING</b>	2
<b>NUMBER OF PUMPS</b> This parameter enables selection of the number of pumps in the system (when 1 single pump is selected, the parameter PUMP ROTATION ENABLED is disabled).	1 - 4
<b>PUMP ROTATION ENABLED</b> This parameter enables activation of pump exchange on each demand from floats or pressure switches. Also, if the main pump thermal cutout (current overload) trips, the second pump is enabled.	Y or N
<b>MINIMUM LEVEL ALARM OUTPUT</b> This parameter enables removal of the minimum level alarm from the cumulative alarm output.	Y or N
<b>SENSOR SENSITIVITY (Sa - Sb - Sc - Sd)</b> This parameter enables display of sensor sensitivity. If with the contacts open a value of 99 is displayed, and if a value of 55 is displayed with water present, set sensitivity to an intermediate value, such as 75.	55 - 99

## 7.2.2 User menu

On completion of panel operation programming, enter the setup menu to configure the various data for motor start-up.

To access the user menu, press the button **SETUP** for 4 seconds in the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<b>MINIMUM VOLTAGE</b> Set by default at -10% . <i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i>	207 (230) 360 (400)
<b>MAXIMUM VOLTAGE</b> Set by default at +10% . <i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i>	253 (230) 440 (400)
<b>MAXIMUM CURRENT P1 / P2 / P3 / P4</b> This parameter enables entry of the maximum current for each motor. Enter the maximum current value, increasing it by 10-15% with respect to the rated motor value. <i>Modifications to operating limits beyond the parameters stated on the model data plate will immediately render the warranty null and void.</i>	1 - ... A
<b>DISPLAY BRIGHTNESS ON STANDBY</b> This parameter enables entry of the brightness setting applied when the display sets to standby (wait 9 seconds for a preview).	0 - 9
<b>TIME FOR ENTRY TO SET-UP</b> This parameter enables entry of the time to keep the SETUP button pressed for access to the set-up menu.	2 - 30 Sec



### 7.3 FUNCTION 3 - Drainage with “COS-PHI” power factor

This operating mode is used for drainage applications with dry running safety control, obtained from the power factor (where “Phi” is the timing angle between current and voltage), without the need for external commands (float or pressure switch), enabling the control of one or more pumps.

On selection of mode 3, all relative parameter fields for this function are enabled.

#### 7.3.1 Programming menu

To select the panel operating logic, access the programming menu by pressing the buttons **SETUP**, **UP** and **DOWN** at the same time on the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<b>LANGUAGE</b> 0=ITA / 1=ENG / 2=FRA / 3=ESP / 4=GER	0 - 4
<b>WORKING MODE SETTING</b>	3
<b>NUMBER OF PUMPS</b> This parameter enables selection of the number of pumps in the system (when 1 single pump is selected, the parameter PUMP ROTATION ENABLED is disabled).	1 - 4
<b>PUMP ROTATION ENABLED</b> This parameter enables activation of pump exchange on each demand from floats or pressure switches. Also, if the main pump thermal cutout (current overload) trips, the second pump is enabled.	Y or N
<b>MINIMUM LEVEL ALARM OUTPUT</b> This parameter enables removal of the minimum level alarm from the cumulative alarm output.	Y or N
<b>COS-PHI ALARM OUTPUT</b> This parameter allows enabling and disabling switching of the output relay for free-voltage contact alarms on dry running.	Y or N

### 7.3.2 User menu

On completion of panel operation programming, enter the setup menu to configure the various data for motor start-up.

To access the user menu, press the button **SETUP** for 4 seconds in the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<p><b>MINIMUM VOLTAGE</b></p> <p>Set by default at -10% .</p> <p><i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i></p>	<p>207 (230)</p> <p>360 (400)</p>
<p><b>MAXIMUM VOLTAGE</b></p> <p>Set by default at +10% .</p> <p><i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i></p>	<p>253 (230)</p> <p>440 (400)</p>
<p><b>MAXIMUM CURRENT P1 / P2 / P3 / P4</b></p> <p>This parameter enables entry of the maximum current for each motor.</p> <p>Enter the maximum current value, increasing it by 10-15% with respect to the rated motor value.</p> <p><i>Modifications to operating limits beyond the parameters stated on the model data plate will immediately render the warranty null and void.</i></p>	<p>1 - ... A</p>
<p><b>MINIMUM COS-PHI P1 / P2 / P3 / P4</b></p> <p>This parameter establishes the minimum Cos-Phi power factor value for each motor</p> <p>Enable operation in manual mode, activate in no-load conditions (dry running), check the power factor reading (e.g. 0.65) and enter the minimum power factor, increasing it by approx. 0.05.</p>	<p>0.15 - 1.00</p>
<p><b>AUTOMATIC RESET ON DRY RUNNING ALARM</b></p> <p>In the event of a dry running alarm (minimum power factor) the panel may attempt to reset automatically, which can be programmable in minutes.</p> <p>4 reset times can be set, in which the system automatically restarts after being blocked. By default these values are set as shown below:</p> <p>The first reset attempt is performed 1 minute after the dry running alarm.</p> <p>The second reset attempt is performed 2 minutes after the alarm.</p> <p>The third reset attempt is performed 3 minutes after the alarm.</p> <p>The fourth reset attempt is performed 4 minutes after the alarm.</p>	<p>1 - 240 Min</p>

DESCRIPTION OF PARAMETER	VALUE
<p><b>SEQUENTIAL RESET ON DRY RUNNING ALARM</b></p> <p>If the value is set to <i>N</i>, all automatic resets are blocked after the fourth attempt; if the value is set to <i>S</i> (Yes) at the end of the fourth attempt, the reset cycle is repeated continuously.</p> <p>The system protecting the panel against dry running conditions activates the reset cycle according to the time intervals set, and resumes the same reset cycle each time water is detected for more than 10 seconds.</p>	Y or N
<p><b>DISPLAY BRIGHTNESS ON STANDBY</b></p> <p>This parameter enables entry of the brightness setting applied when the display sets to standby (wait 9 seconds for a preview).</p>	0 - 9
<p><b>TIME FOR ENTRY TO SET-UP</b></p> <p>This parameter enables entry of the time to keep the SETUP button pressed for access to the set-up menu.</p>	2 - 30 Sec

## 7.4 FUNCTION 4 - Control with analogue signal and floats/pressure switches

This operating mode is used for managed applications via analogue signals and floats or pressure switches, enabling the control of one or more pumps.

On selection of mode 4, all relative parameter fields for this function are enabled.

### 7.4.1 Programming menu

To select the panel operating logic, access the programming menu by pressing the buttons **SETUP**, **UP** and **DOWN** at the same time on the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<b>LANGUAGE</b> 0=ITA / 1=ENG / 2=FRA / 3=ESP / 4=GER	0 - 4
<b>WORKING MODE SETTING</b>	4
<b>NUMBER OF PUMPS</b> This parameter enables selection of the number of pumps in the system (when 1 single pump is selected, the parameter PUMP ROTATION ENABLED is disabled).	1 - 4
<b>PUMP ROTATION ENABLED</b> This parameter enables activation of pump exchange on each demand from floats or pressure switches. Also, if the main pump thermal cutout (current overload) trips, the second pump is enabled.	Y or N
<b>MINIMUM LEVEL ALARM OUTPUT</b> This parameter enables removal of the minimum level alarm from the cumulative alarm output.	Y or N
<b>TYPE OF ANALOGUE SIGNAL</b> This parameter enables selection of the type of analogue signal on input to the panel: 0 = 0-10 V (terminal A = positive / terminal B = negative) 1 = 4-20 mA (terminal A = negative / terminal B = positive)	0 or 1
<b>UNIT OF MEASUREMENT</b> This parameter enables selection of the measurement unit of the analogue signal on input to the panel. "%+" and "bar" : system under refilling /pressurising; "%-" and "cm" : system under emptying	"%+" or "%-" "cm" or "bar"
<b>FULL SCALE OF ANALOGUE SIGNAL</b> This parameter enables selection of the full scale of the analogue signal on input to the panel.	1.0 - 999.9

## 7.4.2 User menu

On completion of panel operation programming, enter the setup menu to configure the various data for motor start-up.

To access the user menu, press the button **SETUP** for 4 seconds in the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<p><b>MINIMUM VOLTAGE</b></p> <p>Set by default at -10% .</p> <p><i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i></p>	<p>207 (230)</p> <p>360 (400)</p>
<p><b>MAXIMUM VOLTAGE</b></p> <p>Set by default at +10% .</p> <p><i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i></p>	<p>253 (230)</p> <p>440 (400)</p>
<p><b>MAXIMUM CURRENT P1 / P2 / P3 / P4</b></p> <p>This parameter enables entry of the maximum current for each motor.</p> <p>Enter the maximum current value, increasing it by 10-15% with respect to the rated motor value.</p> <p><i>Modifications to operating limits beyond the parameters stated on the model data plate will immediately render the warranty null and void.</i></p>	<p>1 - ... A</p>
<p><b>SET POINT</b></p> <p>This parameter enables entry of the set point for pressure (bar), level (centimetres) or percentage to be maintained on the system.</p> <p>The maximum settable value depends on the “ANALOGUE SIGNAL FULL SCALE” set in the ASSISTANCE menu.</p>	<p>0.0 - 999.9</p>
<p><b>THRESHOLD P1 / P2 / P3 / P4</b></p> <p>In the case of threshold P1, this indicates the restart value of the first pump (master) on decrease or increase of the previously entered set point.</p> <p>In the case of threshold P2, P3 and P4, this indicates the start and stop values of the pumps used as backup units.</p> <p>The maximum settable value depends on the “ANALOGUE SIGNAL FULL SCALE” set in the ASSISTANCE menu.</p>	<p>0.0 - 999.9</p>
<p><b>DISPLAY BRIGHTNESS ON STANDBY</b></p> <p>This parameter enables entry of the brightness setting applied when the display sets to standby (wait 9 seconds for a preview).</p>	<p>0 - 9</p>
<p><b>TIME FOR ENTRY TO SET-UP</b></p> <p>This parameter enables entry of the time to keep the SETUP button pressed for access to the set-up menu.</p>	<p>2 - 30 Sec</p>

## 7.5 FUNCTION 5 - Control with analogue signal and level sensors

This operating mode is used for managed applications via analogue signals and level sensors, enabling the control of one or more pumps.

On selection of mode 5, all relative parameter fields for this function are enabled.

### 7.5.1 Programming menu

To select the panel operating logic, access the programming menu by pressing the buttons **SETUP**, **UP** and **DOWN** at the same time on the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<b>LANGUAGE</b> 0=ITA / 1=ENG / 2=FRA / 3=ESP / 4=GER	0 - 4
<b>WORKING MODE SETTING</b>	5
<b>NUMBER OF PUMPS</b> This parameter enables selection of the number of pumps in the system (when 1 single pump is selected, the parameter PUMP ROTATION ENABLED is disabled).	1 - 4
<b>PUMP ROTATION ENABLED</b> This parameter enables activation of pump exchange on each demand from floats or pressure switches. Also, if the main pump thermal cutout (current overload) trips, the second pump is enabled.	Y or N
<b>MINIMUM LEVEL ALARM OUTPUT</b> This parameter enables removal of the minimum level alarm from the cumulative alarm output.	Y or N
<b>SENSOR SENSITIVITY (Sa - Sb - Sc - Sd)</b> This parameter enables display of sensor sensitivity. With the contacts open, if a value of 99 is displayed, and a value of 55 is displayed with water present, set sensitivity to an intermediate value, such as 75.	55 - 99
<b>TYPE OF ANALOGUE SIGNAL</b> This parameter enables selection of the type of analogue signal on input to the panel: 0 = 0-10 V (terminal A = positive / terminal B = negative) 1 = 4-20 mA (terminal A = negative / terminal B = positive)	0 or 1
<b>UNIT OF MEASUREMENT</b> This parameter enables selection of the measurement unit of the analogue signal on input to the panel. "%+" and "bar" : system under refilling /pressurising; "%-" and "cm" : system under emptying	"%+" or "%-" "cm" or "bar"
<b>FULL SCALE OF ANALOGUE SIGNAL</b> This parameter enables selection of the full scale of the analogue signal on input to the panel.	1.0 - 999.9

## 7.5.2 User menu

On completion of panel operation programming, enter the setup menu to configure the various data for motor start-up.

To access the user menu, press the button **SETUP** for 4 seconds in the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<p><b>MINIMUM VOLTAGE</b></p> <p>Set by default at -10% .</p> <p><i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i></p>	<p>207 (230)</p> <p>360 (400)</p>
<p><b>MAXIMUM VOLTAGE</b></p> <p>Set by default at +10% .</p> <p><i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i></p>	<p>253 (230)</p> <p>440 (400)</p>
<p><b>MAXIMUM CURRENT P1 / P2 / P3 / P4</b></p> <p>This parameter enables entry of the maximum current for each motor.</p> <p>Enter the maximum current value, increasing it by 10-15% with respect to the rated motor value.</p> <p><i>Modifications to operating limits beyond the parameters stated on the model data plate will immediately render the warranty null and void.</i></p>	<p>1 - ... A</p>
<p><b>SET POINT</b></p> <p>This parameter enables entry of the set point for pressure (bar), level (centimetres) or percentage to be maintained on the system.</p> <p>The maximum settable value depends on the “ANALOGUE SIGNAL FULL SCALE” set in the ASSISTANCE menu.</p>	<p>0.0 - 999.9</p>
<p><b>THRESHOLD P1 / P2 / P3 / P4</b></p> <p>In the case of threshold P1, this indicates the restart value of the first pump (master) on decrease or increase of the previously entered set point.</p> <p>In the case of threshold P2, P3 and P4, this indicates the start and stop values of the pumps used as backup units.</p> <p>The maximum settable value depends on the “ANALOGUE SIGNAL FULL SCALE” set in the ASSISTANCE menu.</p>	<p>0.0 - 999.9</p>
<p><b>DISPLAY BRIGHTNESS ON STANDBY</b></p> <p>This parameter enables entry of the brightness setting applied when the display sets to standby (wait 9 seconds for a preview).</p>	<p>0 - 9</p>
<p><b>TIME FOR ENTRY TO SET-UP</b></p> <p>This parameter enables entry of the time to keep the SETUP button pressed for access to the set-up menu.</p>	<p>2 - 30 Sec</p>

## 7.6 FUNCTION 6 - Control with analogue signal and “COS-PHI” power factor

This operating mode is used for managed applications via analogue signals with dry running safety control, obtained from the Cos-Phi power factor (where “Phi” is the timing angle between current and voltage), without the need for external commands (float or pressure switch), enabling the control of one or more pumps.

On selection of mode 6, all relative parameter fields for this function are enabled.

### 7.6.1 Programming menu

To select the panel operating logic, access the programming menu by pressing the buttons **SETUP**, **UP** and **DOWN** at the same time on the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<b>LANGUAGE</b> 0=ITA / 1=ENG / 2=FRA / 3=ESP / 4=GER	0 - 4
<b>WORKING MODE SETTING</b>	6
<b>NUMBER OF PUMPS</b> This parameter enables selection of the number of pumps in the system (when 1 single pump is selected, the parameter PUMP ROTATION ENABLED is disabled).	1 - 4
<b>PUMP ROTATION ENABLED</b> This parameter enables activation of pump exchange on each demand from floats or pressure switches. Also, if the main pump thermal cutout (current overload) trips, the second pump is enabled.	Y or N
<b>MINIMUM LEVEL ALARM OUTPUT</b> This parameter enables removal of the minimum level alarm from the cumulative alarm output.	Y or N
<b>COS-PHI ALARM OUTPUT</b> This parameter allows enabling and disabling switching of the output relay for free-voltage contact alarms on dry running.	Y or N
<b>TYPE OF ANALOGUE SIGNAL</b> This parameter enables selection of the type of analogue signal on input to the panel: 0 = 0-10 V (terminal A = positive / terminal B = negative) 1 = 4-20 mA (terminal A = negative / terminal B = positive)	0 or 1
<b>UNIT OF MEASUREMENT</b> This parameter enables selection of the measurement unit of the analogue signal on input to the panel. “%+” and “bar” : system under refilling /pressurising; “%-” and “cm” : system under emptying	“%+” or “%-” “cm” or “bar”
<b>FULL SCALE OF ANALOGUE SIGNAL</b> This parameter enables selection of the full scale of the analogue signal on input to the panel.	1.0 - 999.9



## 7.6.2 User menu

On completion of panel operation programming, enter the setup menu to configure the various data for motor start-up.

To access the user menu, press the button **SETUP** for 4 seconds in the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<p><b>MINIMUM VOLTAGE</b></p> <p>Set by default at -10% .</p> <p><i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i></p>	<p>207 (230)</p> <p>360 (400)</p>
<p><b>MAXIMUM VOLTAGE</b></p> <p>Set by default at +10% .</p> <p><i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i></p>	<p>253 (230)</p> <p>440 (400)</p>
<p><b>MAXIMUM CURRENT P1 / P2 / P3 / P4</b></p> <p>This parameter enables entry of the maximum current for each motor.</p> <p>Enter the maximum current value, increasing it by 10-15% with respect to the rated motor value.</p> <p><i>Modifications to operating limits beyond the parameters stated on the model data plate will immediately render the warranty null and void.</i></p>	<p>1 - ... A</p>
<p><b>MINIMUM COS-PHI P1 / P2 / P3 / P4</b></p> <p>This parameter sets the minimum Cos-Phi power factor value for each motor</p> <p>Enable operation in manual mode, activate in no-load conditions (dry running), check the power factor reading (e.g. 0.65) and enter the minimum power factor, increasing it by approx. 0.05.</p>	<p>0.15 - 1.00</p>
<p><b>AUTOMATIC RESET ON DRY RUNNING ALARM</b></p> <p>In the event of a dry running alarm (minimum power factor) the panel can attempt an automatic reset, which can be programmable in minutes.</p> <p>4 reset times can be set, in which the system automatically restarts after being blocked. By default these values are set as shown below:</p> <p>The first reset attempt is performed 1 minute after the dry running alarm.</p> <p>The second reset attempt is performed 2 minutes after the alarm.</p> <p>The third reset attempt is performed 3 minutes after the alarm.</p> <p>The fourth reset attempt is performed 4 minutes after the alarm.</p>	<p>1 - 240 Min</p>

DESCRIPTION OF PARAMETER	VALUE
<p><b>SEQUENTIAL RESET ON DRY RUNNING ALARM</b></p> <p>If the value is set to <i>N</i>, all automatic resets are blocked after the fourth attempt; if the value is set to <i>S</i> (Yes) at the end of the fourth attempt, the reset cycle is repeated continuously.</p> <p>The system protecting the panel against dry running conditions activates the reset cycle according to the time intervals set, and resumes the same reset cycle each time water is detected for more than 10 seconds.</p>	Y or N
<p><b>SET POINT</b></p> <p>This parameter enables entry of the set point for pressure (bar), level (centimetres) or percentage to be maintained on the system.</p> <p>The maximum settable value depends on the “ANALOGUE SIGNAL FULL SCALE” set in the ASSISTANCE menu.</p>	0.0 - 999.9
<p><b>THRESHOLD P1 / P2 / P3 / P4</b></p> <p>In the case of threshold P1, this indicates the restart value of the first pump (master) on decrease or increase of the previously entered set point.</p> <p>In the case of threshold P2, P3 and P4, this indicates the start and stop values of the pumps used as backup units.</p> <p>The maximum settable value depends on the “ANALOGUE SIGNAL FULL SCALE” set in the ASSISTANCE menu.</p>	0.0 - 999.9
<p><b>DISPLAY BRIGHTNESS ON STANDBY</b></p> <p>This parameter enables entry of the brightness setting applied when the display sets to standby (wait 9 seconds for a preview).</p>	0 - 9
<p><b>TIME FOR ENTRY TO SET-UP</b></p> <p>This parameter enables entry of the time to keep the SETUP button pressed for access to the set-up menu.</p>	2 - 30 Sec

## 7.7 FUNCTION 7 - Filling with level sensors and floats/pressure switches

This operating mode is used for filling applications using level sensors and floats or pressure switches, enabling the control of one pump.

On selection of mode 7, all relative parameter fields for this function are enabled.

### 7.7.1 Programming menu

To select the panel operating logic, access the programming menu by pressing the buttons **SETUP**, **UP** and **DOWN** at the same time on the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<b>LANGUAGE</b> 0=ITA / 1=ENG / 2=FRA / 3=ESP / 4=GER	0 - 4
<b>WORKING MODE SETTING</b>	7
<b>SENSOR SENSITIVITY (Sa - Sb - Sc - Sd)</b> This parameter enables display of sensor sensitivity. If with the contacts open a value of 99 is displayed, and if a value of 55 is displayed with water present, set sensitivity to an intermediate value, such as 75.	55 - 99

### 7.7.2 User menu

On completion of panel operation programming, enter the setup menu to configure the various data for motor start-up.

To access the user menu, press the button **SETUP** for 4 seconds in the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<b>MINIMUM VOLTAGE</b> Set by default at -10% . <i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i>	207 (230) 360 (400)
<b>MAXIMUM VOLTAGE</b> Set by default at +10% . <i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i>	253 (230) 440 (400)
<b>MAXIMUM CURRENT P1</b> This parameter enables entry of the maximum current for the motor. Enter the maximum current value, increasing it by 10-15% with respect to the rated motor value. <i>Modifications to operating limits beyond the parameters stated on the model data plate will immediately render the warranty null and void.</i>	1 - ... A
<b>DISPLAY BRIGHTNESS ON STANDBY</b> This parameter enables entry of the brightness setting applied when the display sets to standby (wait 9 seconds for a preview).	0 - 9
<b>TIME FOR ENTRY TO SET-UP</b> This parameter enables entry of the time to keep the SETUP button pressed for access to the set-up menu.	2 - 30 Sec

## 7.8 FUNCTION 8 - Filling with level sensors and “COS-PHI” power factor

This operating mode is used for filling applications with levels sensors, standard floats or pressure switches and dry running safety control, obtained from the power factor (where “Phi” is the timing angle between current and voltage), without the need for external commands (float or pressure switch), enabling the control of one pump.

On selection of mode 8, all relative parameter fields for this function are enabled.

### 7.8.1 Programming menu

To select the panel operating logic, access the programming menu by pressing the buttons **SETUP**, **UP** and **DOWN** at the same time on the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<b>LANGUAGE</b> 0=ITA / 1=ENG / 2=FRA / 3=ESP / 4=GER	0 - 4
<b>WORKING MODE SETTING</b>	8
<b>COS-PHI ALARM OUTPUT</b> This parameter allows enabling and disabling switching of the output relay for free-voltage contact alarms on dry running.	Y or N
<b>SENSOR SENSITIVITY (Sa - Sb - Sc - Sd)</b> This parameter enables display of sensor sensitivity. If with the contacts open a value of 99 is displayed, and if a value of 55 is displayed with water present, set sensitivity to an intermediate value, such as 75.	55 - 99

### 7.8.2 User menu

On completion of panel operation programming, enter the setup menu to configure the various data for motor start-up.

To access the user menu, press the button **SETUP** for 4 seconds in the main screen of the panel.

DESCRIPTION OF PARAMETER	VALUE
<p><b>MINIMUM VOLTAGE</b></p> <p>Set by default at -10% .</p> <p><i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i></p>	<p>207 (230)</p> <p>360 (400)</p>
<p><b>MAXIMUM VOLTAGE</b></p> <p>Set by default at +10% .</p> <p><i>Modifications to operating limits beyond the default parameters will immediately render the warranty null and void.</i></p>	<p>253 (230)</p> <p>440 (400)</p>
<p><b>MAXIMUM CURRENT P1</b></p> <p>This parameter enables entry of the maximum current for the motor.</p> <p>Enter the maximum current value, increasing it by 10-15% with respect to the rated motor value.</p> <p><i>Modifications to operating limits beyond the parameters stated on the model data plate will immediately render the warranty null and void.</i></p>	<p>1 - ... A</p>
<p><b>MINIMUM COS-PHI P1</b></p> <p>This parameter sets the minimum Cos-Phi power factor value for the motor</p> <p>Enable operation in manual mode, activate in no-load conditions (dry running), check the power factor reading (e.g. 0.65) and enter the minimum power factor, increasing it by approx. 0.05.</p>	<p>0.15 - 1.00</p>
<p><b>AUTOMATIC RESET ON DRY RUNNING ALARM</b></p> <p>In the event of a dry running alarm (minimum power factor) the panel may attempt to reset automatically, which can be programmable in minutes.</p> <p>4 reset times can be set, in which the system automatically restarts after being blocked; By default these values are set as shown below:</p> <p>The first reset attempt is performed 1 minute after the dry running alarm.</p> <p>The second reset attempt is performed 2 minutes after the alarm.</p> <p>The third reset attempt is performed 3 minutes after the alarm.</p> <p>The fourth reset attempt is performed 4 minutes after the alarm.</p>	<p>1 - 240 Min</p>

DESCRIPTION OF PARAMETER	VALUE
<p><b>SEQUENTIAL RESET ON DRY RUNNING ALARM</b></p> <p>If the value is set to <i>N</i>, all automatic resets are blocked after the fourth attempt; if the value is set to <i>S</i> (Yes) at the end of the fourth attempt, the reset cycle is repeated continuously.</p> <p>The system protecting the panel against dry running conditions activates the reset cycle according to the time intervals set, and resumes the same reset cycle each time water is detected for more than 10 seconds.</p>	Y or N
<p><b>DISPLAY BRIGHTNESS ON STANDBY</b></p> <p>This parameter enables entry of the brightness setting applied when the display sets to standby (wait 9 seconds for a preview).</p>	0 - 9
<p><b>TIME FOR ENTRY TO SET-UP</b></p> <p>This parameter enables entry of the time to keep the SETUP button pressed for access to the set-up menu.</p>	2 - 30 Sec

## 8. ALARMS



ALARM MOTOR ...  
DRY RUNNING

The measured power factor value is the set value and the panel shuts down the relative pump. The display and red led blink and the cumulative alarm output is activated (voltage-free contacts NC-C-NO).

The system resets automatically on the basis of the times set during programming.

To reset the alarm manually press the **UP** or **DOWN** arrow button and then the **OK** button.



ALARM MOTOR ...  
IN PROTECTION

The load current absorption is higher than the set value and the panel shuts down the relative pump. The display and red led blink and the cumulative alarm output is activated (voltage-free contacts NC-C-NO).

To reset the alarm manually press the **UP** or **DOWN** arrow button and then the **OK** button.




ALARM MOTOR ...  
OVERTEMPERATURE

The thermal cutout of the motor (klicson) has tripped on temperature overload. The display and red led blink and the cumulative alarm output is activated (voltage-free contacts NC-C-NO).

If not used, close the motor klicson input.

The system is reset automatically when the motor Klicson closes. To reset the alarm manually press the **UP** or **DOWN** arrow button and then the **OK** button.

In the event of motor overtemperature alarm the pumps do not stop.



ALARM VOLTAGE  
TOO LOW

The measured mains voltage is too low (the pumps are shut down).

The display and red led blink and the cumulative alarm output is activated (voltage-free contacts NC-C-NO).

The system is reset automatically when voltage goes back up.

To reset the alarm manually press the **UP** or **DOWN** arrow button and then the **OK** button.



**ALARM VOLTAGE  
TOO HIGH**

The measured mains voltage is too high (the pumps are shut down).

The display and red led blink and the cumulative alarm output is activated (voltage-free contacts NC-C-NO).

The system is reset automatically when voltage goes back down.

To reset the alarm manually press the **UP** or **DOWN** arrow button and then the **OK** button.

**ALARM SEQUENCE  
OR LACK PHASES**

The phase sequence is incorrect or one or more phases is missing (the pumps are shut down). The display and red led blink and the cumulative alarm output is activated (voltage-free contacts NC-C-NO).

The system is reset manually turning off and on the electrical panel after reconnecting the phases correctly.

**ALARM MAX  
LEVEL**

The alarm float detects maximum level reached (the pumps are not shut down). The display and red led blink and the cumulative alarm output is activated (voltage-free contacts NC-C-NO).

The system is reset automatically when the alarm float switch contact opens.

To reset the alarm manually press the **UP** or **DOWN** arrow button and then the **OK** button.

The alarm is repeated if the level does not fall.

**ALARM MOTOR ...  
NO COMMUNICATION**

Connection problems between motherboard and expansion modules.

The display and red led blink and the cumulative alarm output is activated (voltage-free contacts NC-C-NO).

To reset the alarm manually press the **UP** or **DOWN** arrow button and then the **OK** button.

Check the connection of the flat cable between the boards *Mainbord* and *EXP*.

**ALARM MIN  
LEVEL**

The minimum level float or minimum level sensors detect minimum level reached (the pumps are shut down). The display and red led blink and the cumulative alarm output is activated (voltage-free contacts NC-C-NO).

The system is reset automatically when the min level float switch contact closes.

To reset the alarm manually press the **UP** or **DOWN** arrow button and then the **OK** button.

This alarm can be disabled in the ASSISTANCE menu.





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