

OPTIMA pH/ORP NEXT

INSTALLATION MANUAL

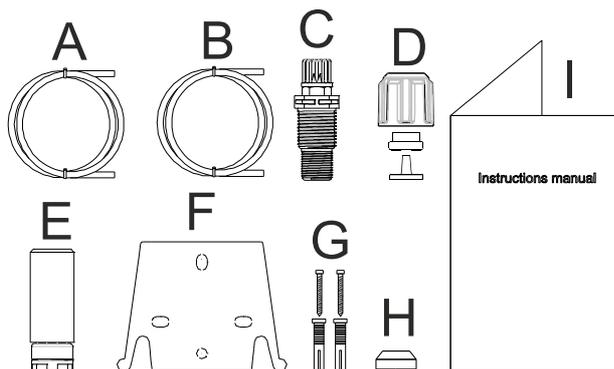
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INSTALLATION MANUAL AND COMMISSIONING GUIDE FOR THE OPTIMA pH/ORP NEXT SERIES DOSING PUMPS

PACK CONTENTS:

- A. Opaque tube for connecting the output from the pump to the point of injection
- B. Transparent tube for connecting the bleeder valve for manual priming
- C. Injection fitting
- D. Tube connection kit
- E. Foot filter
- F. Wall fixing bracket
- G. Anchor bolts for fixing the wall bracket
- H. Pump body screws protection caps
- I. Instruction Manual



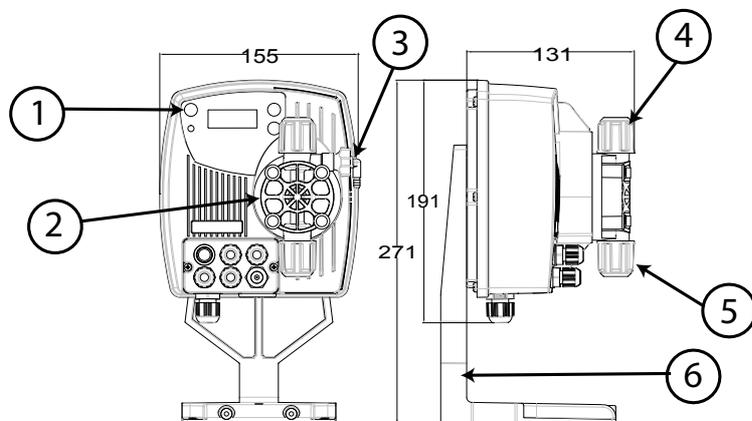
Below are the technical data and the pump performance:

PVDF-T					
Model	Back Pressure	Flow Rate	cc /Stroke	Connections	Strokes / min
	bar	L/h		In / Out	
200	8	5	0,52	4 / 6	160
	10	3	0,31		

INTRODUCTION

The dosing pump consists of a control section containing the electronics and the magnet, and a hydraulic section, which is always in contact with the liquid to be dosed.

Check the main specifications of your pump on the data plate



- 1 Control panel
- 2 Dosing head
- 3 Valve for priming the pump
- 4 Delivery connection
- 5 Suction connection
- 6 Support for base-plate (*optional*)

It is advisable to check the chemical compatibility between the product to be dosed and the materials with which it will come into contact.

MATERIALS USED TO MAKE THE HEAD OF THE PUMP

- **Casing:** PVDF-T
- **Valve:** PVDF-T
- **Balls:** Ceramic
- **Membrane:** PTFE

TECHNICAL SPECIFICATIONS

- **Weight:** 1,5 Kg
- **Power supply:** 110 ÷ 230 Vac (50-60 Hz)
- **Power consumption:** 12 W
- **Fuse:** 2A 250V T 5x20
- **Protection class:** IP65



READ CAREFULLY THE FOLLOWING WARNINGS BEFORE PROCEEDING TO INSTALL OR CARRY OUT MAINTENANCE ON THE PUMP.



WARNING: ALWAYS DISCONNECT THE POWER SUPPLY BEFORE PROCEEDING TO INSTALL OR CARRY OUT MAINTENANCE ON THE PUMP.



WARNING: WE RECOMMEND INSTALLING THE PUMP IN A VERTICAL POSITION TO ENSURE PROPER OPERATION.



WARNING: PRODUCT INTENDED FOR PROFESSIONAL USE ONLY, BY QUALIFIED PERSONNEL.



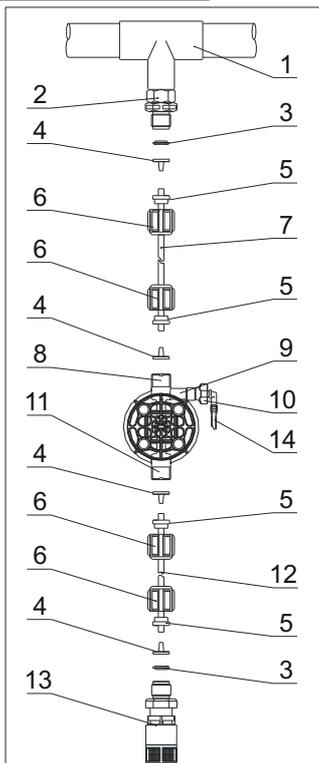
WARNING: THE MAINTENANCE OF THE PUMP MUST BE CARRIED OUT BY QUALIFIED AND AUTHORIZED PERSONNEL.

- **H₂SO₄ SULPHURIC ACID** Before dosing chemicals that could react with water it is necessary to dry all the internal hydraulic parts.
- The ambient temperature must not exceed 40°C. The relative humidity must be lower than 90%. The pump protection class is IP65. Do not install the pump in a place where it would be in direct sunlight.
- Secure the pump firmly into place in order to avoid excessive vibrations.
- The power-supply voltage available in the system and the working pressure must be compatible with those indicated on the pump label.

WIRING CONNECTIONS

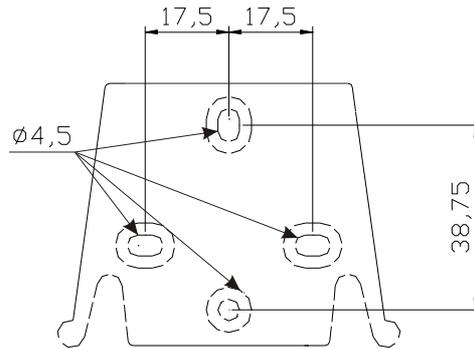
	<p>Input A Power supply 110 ÷ 230Vac (50 Hz)</p>	<p>The pump should be connected to a power supply complying with the indications shown on the label on the pump side. Failure to comply with the limits indicated may cause damage to the pump.</p> <p>These pumps have been designed to absorb minor over voltages However, in order to prevent any damage to the pump it is always preferable to avoid connecting it to the same source of power as electrical equipment that generates high voltages.</p> <p>The connection to the three-phase 380V line MUST always be made solely between phase and neutral. No connections should be made between phase and earth.</p>
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HYDRAULIC CONNECTIONS



1. Injection point
2. Injection coupling
3. Gasket
4. Washer holder
5. Pipe clamp
6. Ring nut
7. Delivery pipe (rigid)
8. Delivery coupling
9. Pumping body
10. Bleeding valve
11. Suction coupling
12. Suction hose (soft)
13. Foot filter
14. Bleeding valve coupling

Drilling template for the wall bracket



After about 800 hours of operation, tighten the bolts of the pump body by using a tightening torque of **3 Nm**.

In making the hydraulic connections it is necessary to comply with the following instructions:

- The **BOTTOM FILTER** should be installed at a distance of about 5-10 cm from the bottom, in order to avoid clogging;
- The installation with the pump below the liquid level is recommended for pumps with very low flow rates. In particular when dosing products that have a tendency to develop gases (ex: sodium hypochlorite, hydrazine, hydrogen peroxide...)
- If it is necessary to use tubes longer than those supplied with the installation kit, they must always have the same dimensions as those supplied with the pump. If the **DELIVERY PIPE** is exposed to direct sunlight, it is recommended the use of a black UV-resistant pipe;
- It is advisable for the **INJECTION POINT** to be placed higher than the pump or the tank.;
- The **INJECTION VALVE** supplied with the pump, should always be installed at the end of the dosing-flow delivery line.

STARTING UP THE PUMP

Once you have checked all the above operations, you are ready to start the pump.

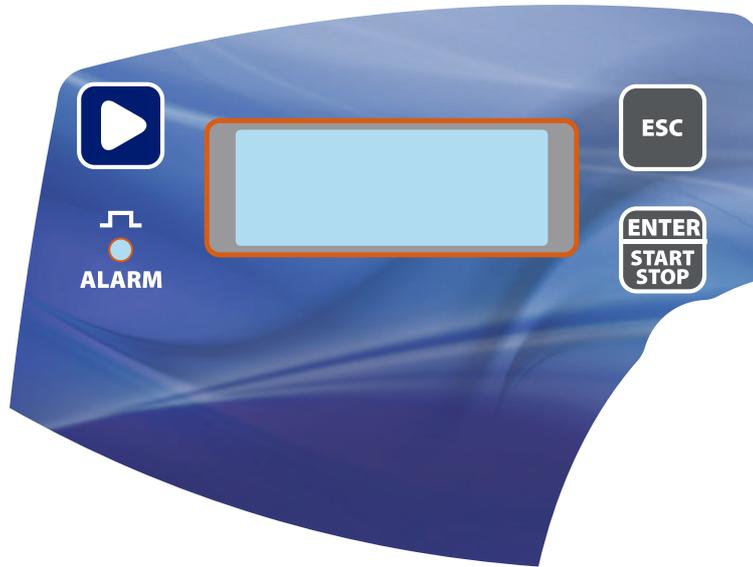
Priming

- Start the pump
- Open the priming coupling by turning the knob anticlockwise and wait for the liquid to flow out of the hose connected to it.
- Once you are sure that the pump is completely filled with liquid you can close the coupling and the pump begins to dose.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
The pump is running regularly but the dosage was interrupted	The valves are clogged	Clean the valves or replace them if it's not possible to remove the deposits
	Excessive intake height	Position the pump or the tank so as to reduce the intake height
	The liquid is too viscous	Reduce the intake height or use a pump with a higher flow rate
Insufficient flow rate	Leaky valves	Check the tightness of the nuts
	The liquid is too viscous	Reduce the intake height or use a pump with a higher flow rate
	Partial clogging of the valves	Clean the valves or replace them if it's not possible to remove the deposits
Irregular pump flow rate	Transparent PVC tube for delivery	Use the opaque PE tube for delivery
The diaphragm is breaking	Excessive back pressure	Check the system pressure. Check if the injection valve is clogged. Check if there is a clogging between the discharge valves and the injection point.
	Operation without liquid	Check the presence of the foot filter (valve)
	The diaphragm is not fixed properly	If the diaphragm has been replaced, check its proper tightening
The pump does not turn on	Insufficient power supply	Check if the values on the plate of the pump correspond to those of the electrical network.

Control panel – OPTIMA pH/ORP NEXT



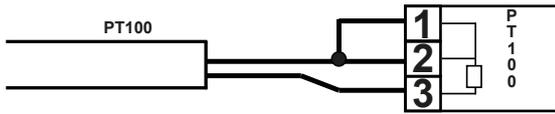
 + 	To access the programming menu. (Press and hold down simultaneously for at least 3 seconds).
	To start and stop the pump. To disable the display notification in case of active level alarm condition (only alarm function), flow alarm condition and memory. In programming mode it functions as “enter”, to confirm the access and the changes to the various menu levels.
	To “escape” the various menu levels. Before exiting the programming mode you will be prompted to save the changes. Prolonged pressure displays the screen for the flow sensor calibration.  +  to change the contrast.
	To scroll the menus or change the parameters in programming mode. Prolonged pressure enables the priming.
	Green LED flashes while dosing. Red LED turns on in case of various alarm conditions.

Electrical connections

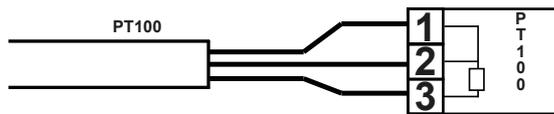
	1		
	2	PT100 temperature probe input (see the connection diagram)	
	3		
	4	Not Used	
	5	Pole -	pH or Redox probe input (pre-wired with BNC)
	6	Pole +	
	7	Level control probe input	
	8		
	9	Remote control input (start-stop)	
	10		
	11	Flow sensor input	
	12		

CONNECTIONS DIAGRAM

2-wire PT100 connection diagram

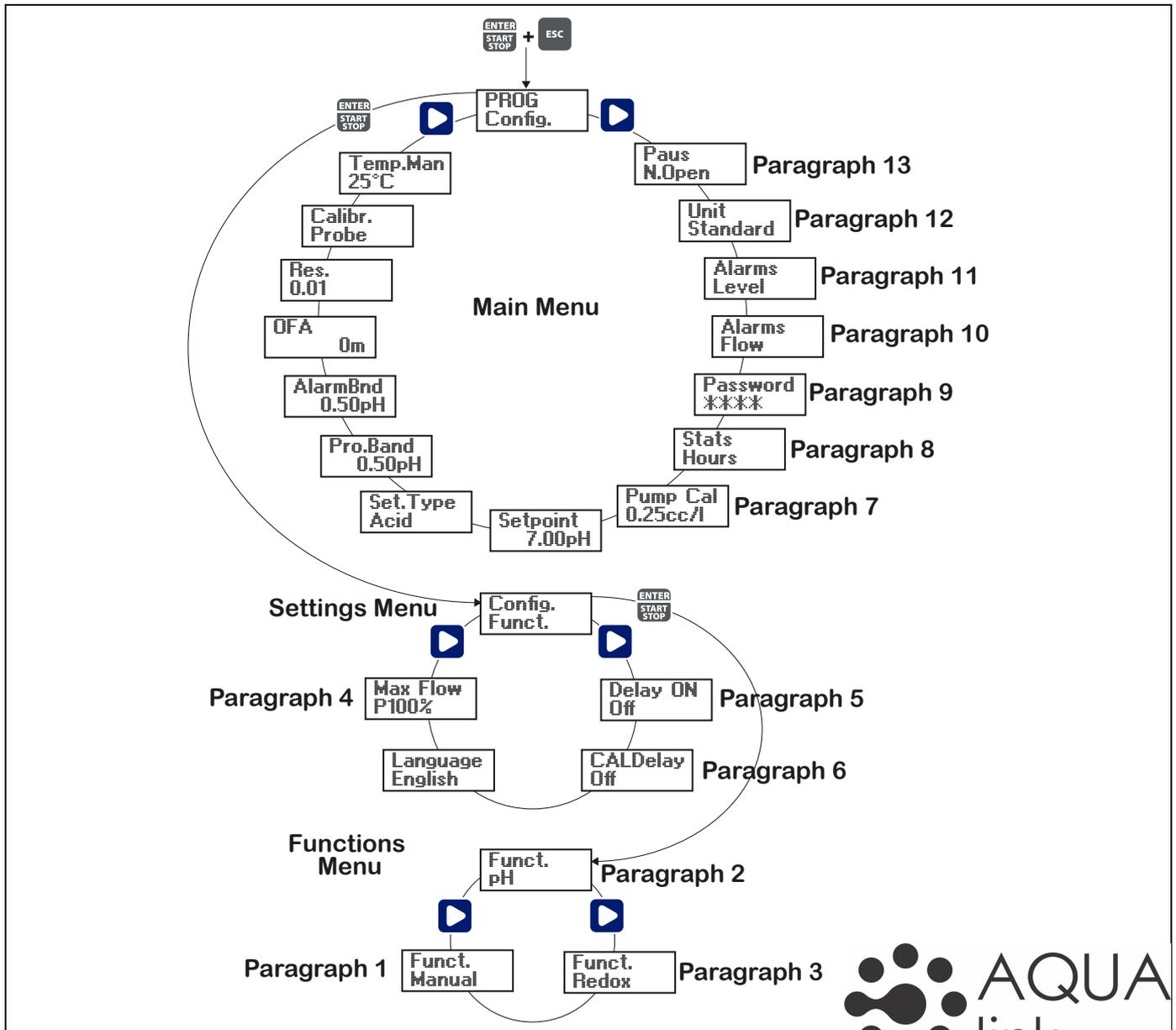
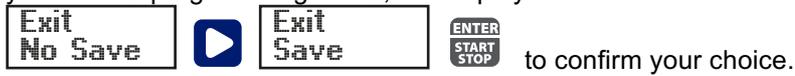


3-wire PT100 connection diagram



OTPIMA pH/ORP NEXT Programming Menu

Press the **ENTER START STOP** + **ESC** keys for more than three seconds to access the programming mode. Press the **▶** key to scroll the menu items, then press the **ENTER START STOP** key to access the options. Whenever a menu item is editable, it flashes. By default the pump is set for constant mode. The pump automatically returns to operating mode after 1 minute of inactivity. In this case, the data entered will not be saved. Press the **ESC** key to exit the programming levels. When you exit the programming mode, the display shows:



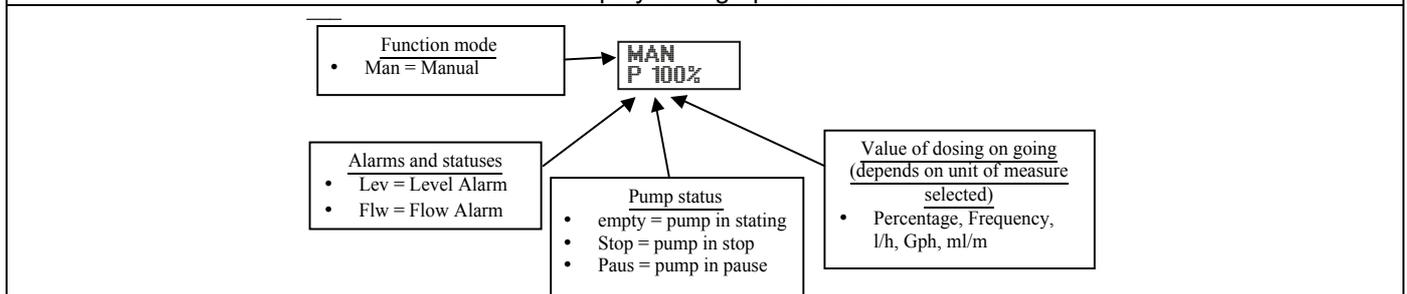
Setting the language

Programming	Operation
	<p>Allows you to set the language. By default the pump is set to English.</p> <p>Press to access the item, and then press to set the language.</p> <p>Press to confirm and return to the main menu.</p>

Paragraph 1 – Manual dosing

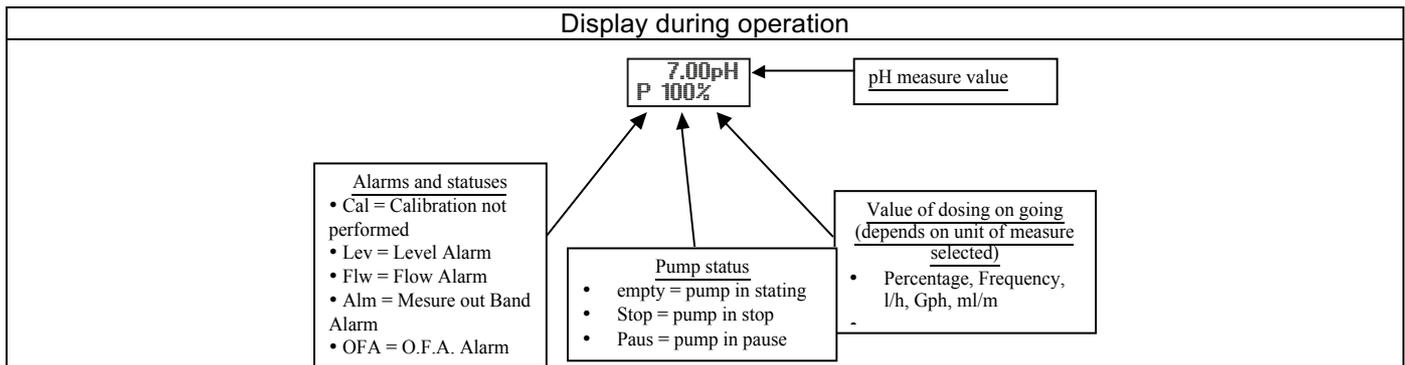
Programming	Operation
	<p>The pump works in constant mode. The flow rate can be adjusted manually by pressing + simultaneously.</p>

Display during operation

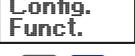
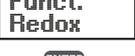
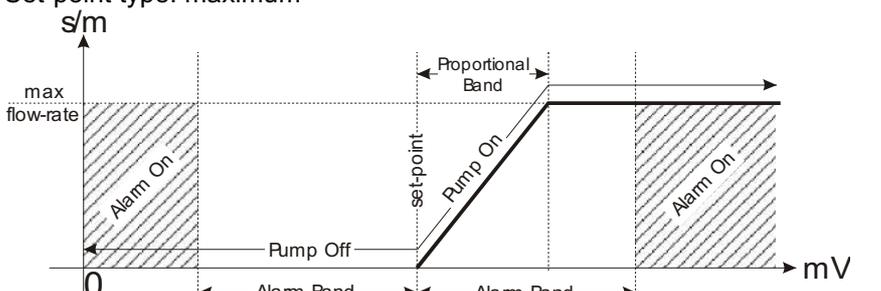
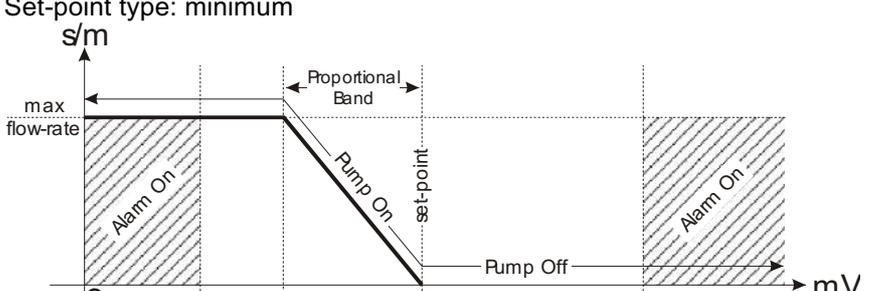


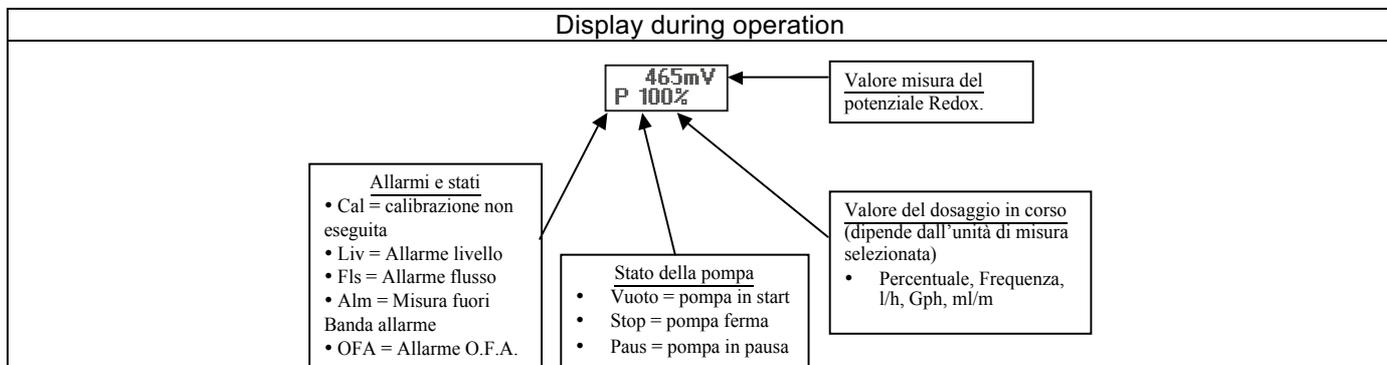
Paragraph 2 – Proportional dosing for the pH measurement (factory default)

Programming	Operation
	<p>The pump measures and controls the pH value of a solution, by programming the following parameters: set-point, set-point type, proportional band and alarm band.</p> <p>Set-point type: acid</p> <p>Set-point type: alkaline</p> <p>Can also be programmed:</p> <ul style="list-style-type: none"> - The O.F.A. (Over Feed Alarm) time in minutes, a set period of time after which, if the measured pH does not reach the set-point, an alarm signal is activated. - The resolution of the measurement (1 or 2 digits) - Activation / deactivation of the calibration procedure - Manual temperature value in °C (default) or °F <p>The maximum frequency can be changed during the operation by pressing + simultaneously.</p>



Paragraph 3 – Proportional dosing for the Redox (O.R.P.) measurement

Programming	Operation
<p>  +  </p> <p>  </p> <p>  </p> <p>  </p> <p>   </p> <p>  </p> <p>  </p> <p>  </p> <p>  </p> <p>  </p> <p>    </p> <p>  </p> <p>  </p> <p>  </p> <p>  </p> <p>    </p> <p>  </p> <p>  </p> <p>    </p> <p>  </p> <p>  </p> <p>    </p> <p>  </p> <p>  </p>	<p>The pump measures and controls the Redox value of a solution, by programming the following parameters: set-point, set-point type, proportional band and alarm band.</p> <p>Set-point type: maximum</p>  <p>Set-point type: minimum</p>  <p>Can also be programmed:</p> <ul style="list-style-type: none"> - The O.F.A. (Over Feed Alarm) time in minutes, a set period of time after which, if the measured Redox value does not reach the set-point, an alarm signal is activated. - The resolution of the measurement (1 or 2 digits) - Activation / deactivation of the calibration procedure <p>The maximum frequency can be changed during the operation by pressing  +  simultaneously.</p>



Paragraph 4 – Setting the Maximum Flow Rate

Programming	Operation
<pre> graph TD A[ENTER START STOP + ESC] --> B[PROG Config.] B --> C[ENTER START STOP] C --> D[Config. Funct.] D --> E[Delay ON Off] E --> F[CALDelay Off] F --> G[Language English] G --> H[Max Flow P100%] H --> I[Max Flow F160c/m] I --> J[] </pre>	<p>Allows you to set the maximum flow rate of the pump and the programmed mode (% or frequency) is used as the standard measurement unit when displaying the flow rate.</p> <p>Press to access the item then press to set the value. Press to confirm and return to the main menu.</p>

Paragraph 5 – Setting the Power On Delay

Programming	Operation
<pre> graph TD A[ENTER START STOP + ESC] --> B[PROG Config.] B --> C[ENTER START STOP] C --> D[Config. Funct.] D --> E[Delay ON Off] E --> F[] </pre>	<p>Allows you to set a pump operation delay at the start up of the pump. This delay takes effect only if the pump is switched off and then switched on by disconnecting the power supply.</p> <p>The delay can be disabled, Off (default) or can be set from 1 to 60 minutes.</p> <p>With the delay enabled, during the set time the LED flashes (1 sec On – 1 sec Off) and the display shows the countdown in seconds. If the pump is in Stop mode the display shows only the flashing LED. During the delay time the function can be disabled by accessing the menu and setting the time to Off.</p> <p>Press to access the item, and then press to set the value. Press to confirm and return to the main menu.</p>

Paragraph 6 – Setting the Calibration Delay

Programming	Operation
<pre> graph TD A[ENTER START STOP + ESC] --> B[PROG Config.] B --> C[ENTER START STOP] C --> D[Config. Funct.] D --> E[Delay ON Off] E --> F[CAL Delay Off] F --> G[] </pre>	<p>Allows you to set a pump operation delay after the probe (Redox or pH) calibration</p> <p>The delay can be disabled, Off (default) or can be set from 1 to 60 minutes.</p> <p>With the delay enabled, during the set time the LED flashes (1 sec On – 1 sec Off) and the display shows the countdown in seconds. If the pump is in Stop mode the display shows only the flashing LED. During the delay time the function can be disabled by accessing the menu and setting the time to Off.</p> <p>Press to access the item, and then press to set the value. Press to confirm and return to the main menu.</p>

Paragraph 7 – Flow Rate Calibration

Programming	Operation
	<p>On the main menu appears the memorized cc/stroke value. You can perform the calibration in two modes:</p> <p>MANUAL – insert manually the cc/stroke value using the key and then confirm with the key.</p> <p>AUTOMATIC – the pump runs 100 strokes, which are started by pressing the key, and at the end of the strokes insert the amount aspirated by the pump using the key and confirm with the key.</p> <p>The data entered will be used for the calculation of the flow rates.</p>

Paragraph 8 – Statistics

Programming	Operation
	<p>On the main menu is displayed, in hours, the operating time of the pump; press to access other statistics:</p> <ul style="list-style-type: none"> - Strokes = the number of strokes performed by the pump - Q.ta (L) = the quantity dosed from the pump expressed in liters; this information is calculated based on the memorized cc/stroke value - Power = the number of pump activations <p>- Reset = press to reset the counters, select (YES) or (NO), then press to confirm.</p> <p>Press to return to the main menu.</p>

Paragraph 9 – Password

Programming	Operation
	<p>By setting the password, the programming section can be accessed to view all the setup parameters, but every time you try to change the settings you will be prompted for the password.</p> <p>The flashing line indicates the editable number; press to select the number (from 1 to 9), then press to select the number to modify, and then press to confirm.</p> <p>By setting “0000” (default), the password will be eliminated.</p>

Paragraph 10 – Flow Alarm

Programming	Operation
	<p>Allows you to activate (deactivate) the flow sensor.</p> <p>Once activated (On) by pressing the key, you can set the number of signals the pump requires before starting the alarm. Press and the number will start to flash; press to set the value. Press to confirm. Press to return to the main menu.</p>

Paragraph 11 – Level Alarm

Programming	Operation
	<p>Allows you to set the pump for the level alarm activation, with dosage operation interruption (Stop), or simple activation of the alarm signal without dosage operation interruption.</p> <p>Press to access the item then press to set the alarm type. Press to confirm. Press to return to the main menu.</p>

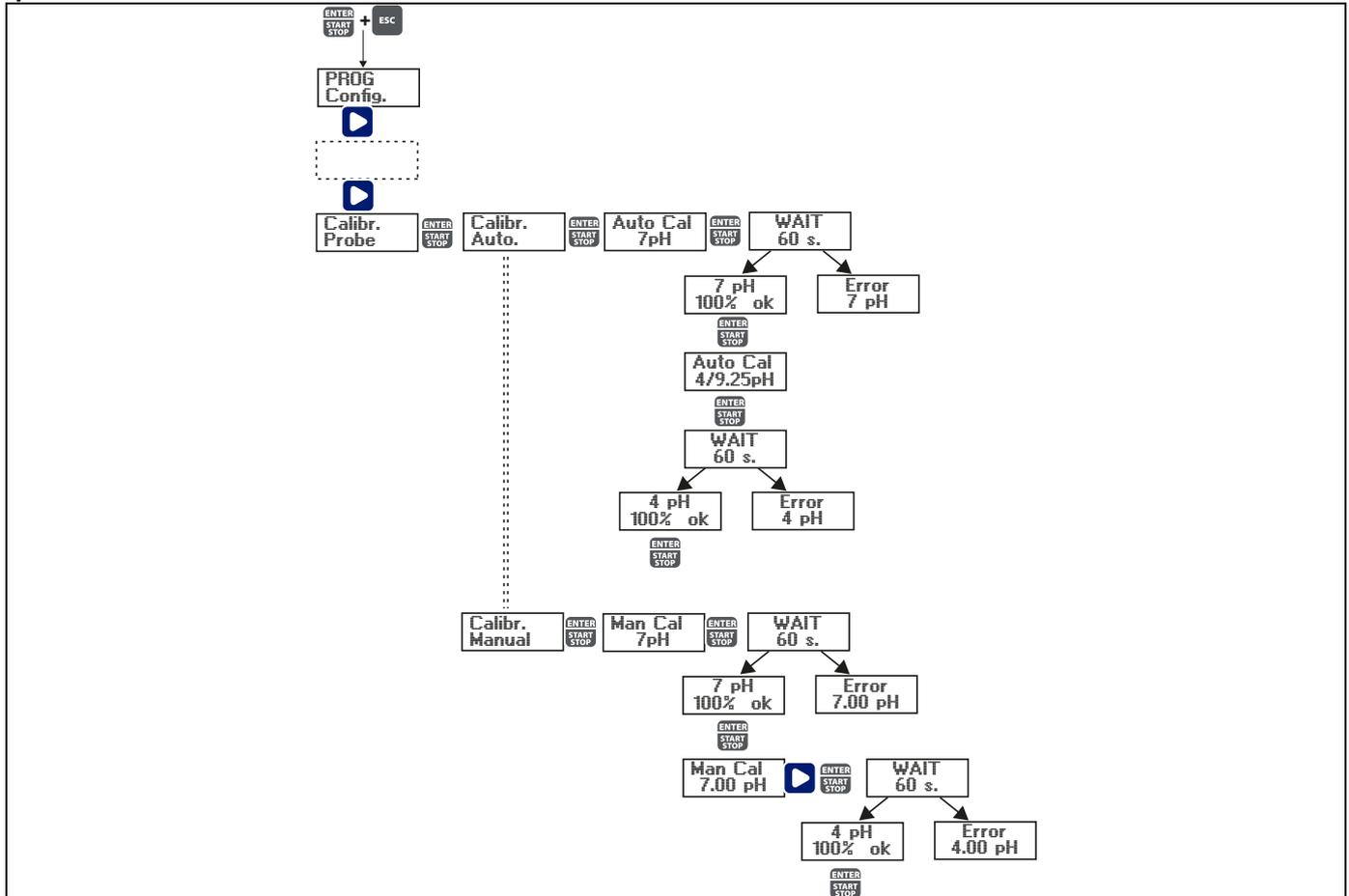
Paragraph 12 – Flow Rate Measurement Unit Display

Programming	Operation
	<p>Allows you to set the measurement unit of the displayed dosage.</p> <p>Press to access the item, then press to set the type of unit, L/h (Liter/hour), Gph (Gallons/hour), mL/m (milliliters/minute) or standard (% or frequency, according to the settings). Press to confirm and return to the main menu.</p>

Paragraph 13 – Setting the Pause

Programming	Operation
	<p>Remote input to pause the pump. By default, the system is set to Normally Open.</p> <p>Press to access the item, and then press to set the value (N. OPEN or N. CLOSED).</p> <p>Press to confirm and return to the main menu.</p>

pH Calibration Menu



You can choose the automatic or manual calibration mode, in both cases the calibration at pH 7 is automatic.

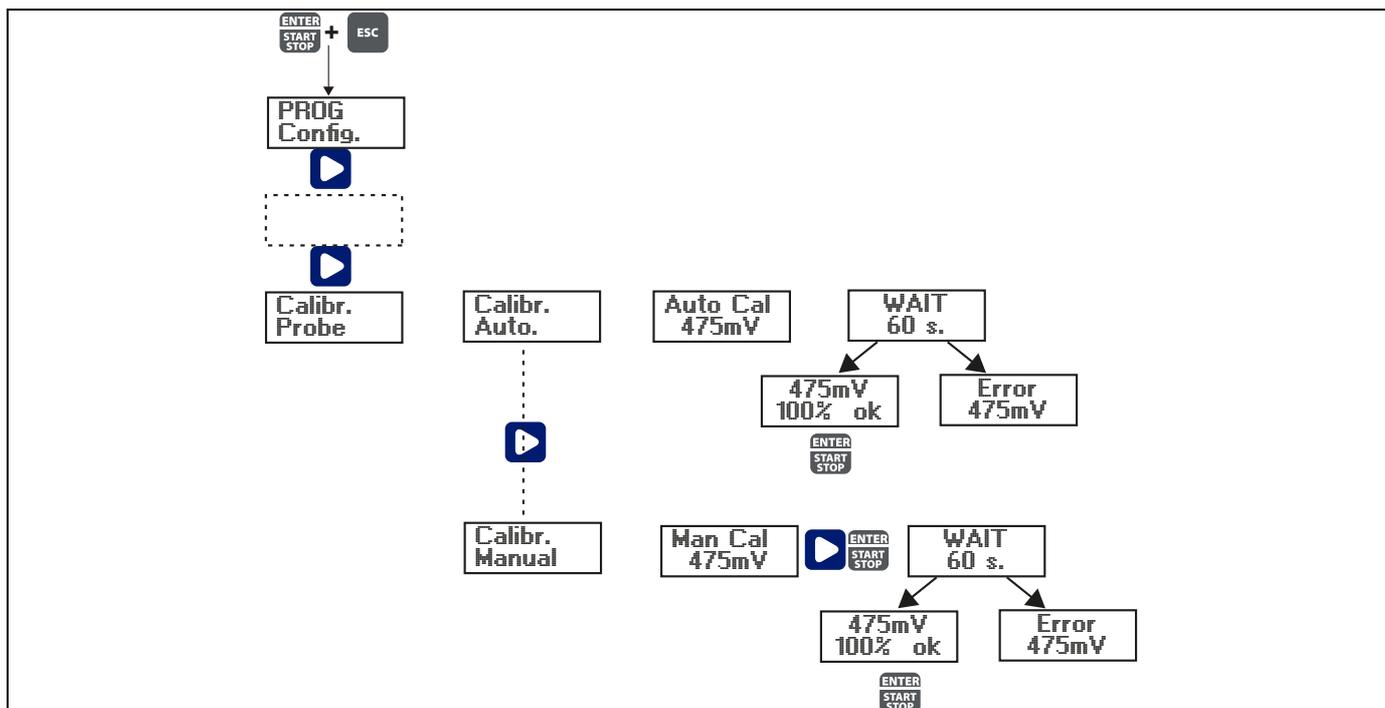
- Automatic calibration:

When the display shows the value of the buffer solution, insert the probe into the bottle, press and the display will show the countdown of the 60 seconds required to complete the calibration. If the quality of the alignment is less than 50%, an error appears on the display; press to exit the calibration (after 4 seconds the pump will automatically exit the calibration); if the quality is higher than 50%, the value appears on the display; pressing you will be prompted for the pH 4 or 9 buffer solution; at this point the procedure is similar to the previous calibration.

- Manual calibration:

When the display shows the value of the buffer solution, insert the probe into the bottle, press and the display will show the countdown of the 60 seconds required to complete the calibration. If the quality of the alignment is less than 50%, an error appears on the display; press to exit the calibration (after 4 seconds the pump will automatically exit the calibration); if the quality is higher than 50%, the value appears on the display; pressing on the display will flash the pH 7.00 value; press to insert the value of my solution, then press to confirm and start the calibration procedure as described previously.

Redox (O.R.P.) Calibration Menu



You can choose the automatic or manual mode.

- Automatic calibration:

When the display shows the value of the buffer solution, insert the probe into the bottle, press and the display will show the countdown of the 60 seconds required to complete the calibration. If the quality of the alignment is less than 50%, an error appears on the display; press to exit the calibration (after 4 seconds the pump will automatically exit the calibration); if the quality is higher than 50%, the value appears on the display; press and the procedure is completed.

- Manual calibration:

When the display shows the value of the buffer solution, insert the probe into the bottle, press and the display will show the value 465mV flashing, insert the probe into my solution, press to display the value of my solution, then press to confirm and start the calibration procedure as described previously.

Alarms

Display	Cause	Remedy
Alarm LED on "Lev" icon flashing	End level alarm, without pump operation interruption.	Restore the liquid level.
Alarm LED on "Lev" and "Stop" icons flashing	End level alarm, with pump operation interruption.	Restore the liquid level.
Alarm LED on "Flw" icon flashing	Flow alarm activated, the pump has not received from the flow sensor the programmed number of signals.	Press the key.
"OFA" icon flashing "Stop" icon flashing	O.F.A. alarm	Press the key to stop the flashing of the "Stop" icon, press the key again to restart the pump.
"Alm" icon flashing	The value read by the probe is out of the alarm band set	Check the "Alarm Band" parameter for the correct settings in programming mode.
"Cal" icon flashing	Probe not calibrated alarm	Perform the probe calibration procedure.