

# ***Electromagnetic pH regulation pH-220 / pH+220***



## **INSTALLATION AND OPERATING INSTRUCTIONS**

*You have just acquired an electromagnetic dosing pump with integrated pH regulation, thank-you for placing your trust in our product. This is a highly efficient, robust and reliable dosing pump. Before proceeding with its installation and use, please read this document carefully. It contains important recommendations and advice concerning pump operations and interventions. This document should be kept and read by all users before they operate, or intervene on, the device.*

### **IMPORTANT !**

**This manual contains important information concerning the safe installation and operation of the device. Failure to comply with recommendations and instructions could lead to serious injury or death.**

**Please comply with all instructions and recommendations to avoid any risk of accidents or incidents involving persons or equipment.**

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## ATTENTION !

**This pump should only be used with pool-grade liquid products.**

**The concentration of injected solutions must not exceed 33 %.**

## GENERAL SAFETY INFORMATION

In the event of an emergency of any type within the plant room where the pump is installed, cut the power supply to the installation immediately and disconnect the pump.

In installations where highly dangerous chemicals are in use, safety protocols concerning said chemicals must be strictly followed.

For dosing pumps installed outside the EU, follow the safety standards in effect in the country of installation.

The manufacturer of the dosing pump declines all responsibility for any injury to persons or damage sustained by equipment imputable to the non-compliant or faulty installation or operation of this product.

### Caution

Install the dosing pump in a way that facilitates access for maintenance or any other intervention.

Never block or obstruct the access to the dosing pump. Install an “interlock” device to automatically inhibit the pump in the event that the flow rate drops to a dangerously low level.

Dosing pump maintenance and cleaning interventions must only be carried out by qualified personnel.

Prior to any maintenance intervention, always drain the dosing pump tubes and unions.

Always drain and wash out tubes that have contained dangerous chemicals. Use the safety equipment recommended for the safe handling of such chemicals set out in their material safety data sheets.

Always read the chemical properties and technical data of the reagent used very carefully.

## INTRODUCTION

The pH -/+ 220 series electromagnetic dosing pumps are ideal for dosing liquid chemicals in swimming pool installations. Each pump comprises 3 components:

- The casing
- The electronic circuit
- The electromagnetic pump

### THE CASING:

The series pH-/+ 220 dosing pump is housed in a polypropylene casing that guarantees IP65 protection. Featuring two apertures separated by a distance of 63 mm, it is designed to be mounted on a wall.

### ELECTRONIC CIRCUIT:

The control circuit determines the electromagnetic pump's rest and operation cycles.

### THE ELECTROMAGNETIC PUMP:

The electromagnetic pump features a maximum flow rate of 2l/h and a back pressure of 2 bar.

The pH-/+220 dosing pump is designed to monitor and regulate the pH of swimming pool water.

**The pH -220 version may only be used to dose pH minus to lower the pH of swimming pool water, while the pH +220 version is intended to dose pH plus in order to raise the swimming pool water's pH.**

Programming and information is viewed by means LEDs on the display panel. Dosing is proportional.

To facilitate priming, the pump may be activated manually (see the section on Priming the pump).

# INSTALLATION

The dosing pump comes with all the parts necessary for its installation. To ensure correct operation of the pump, mount it vertically in a well aired accessible location. This will also facilitate future interventions.

Make sure that the pump will not be exposed to direct sunlight, rain or splashing.

Be careful to install the pump at least 1.5m above the level of the chemical to be dosed.

Attach the suction tube (crystal) to the suction union found at the bottom of the pump dosing head.

Mount the strainer on the end of the suction tube that is placed in the reagent tank.

The suction tube must be as short as possible and free of any loops to avoid the formation of air bubbles.

Attach the return tube (opaque) at the top of the pump's dosing head.

Lastly, mount the injection rod on the pool return line and connect the end of the opaque tube to it.

## IMPORTANT:

**The injection rod must be mounted last on the pool return line, after the heater, booster pump and any other equipment item that could be damaged by the high concentrations of the chemicals injected.**

Ensure that the tubes and pipes used are compatible with the chemicals being dosed.

The pH probe should be installed in its holder after the filter and upstream from the injection rod. Pierce and tap the return line Ø15/21 or use a saddle clamp. Connect the end of the probe cable under the dosing pump to the BNC terminal marked "pH".

To connect the pump to the installation, **only use the tubes provided**. The use of any other tubing is prohibited at the risk of cancellation of the guarantee.

- Suction tube (crystal) and return tube (opaque): 4 x 6 mm.

- Operating temperature: - 10 / + 60 °C.

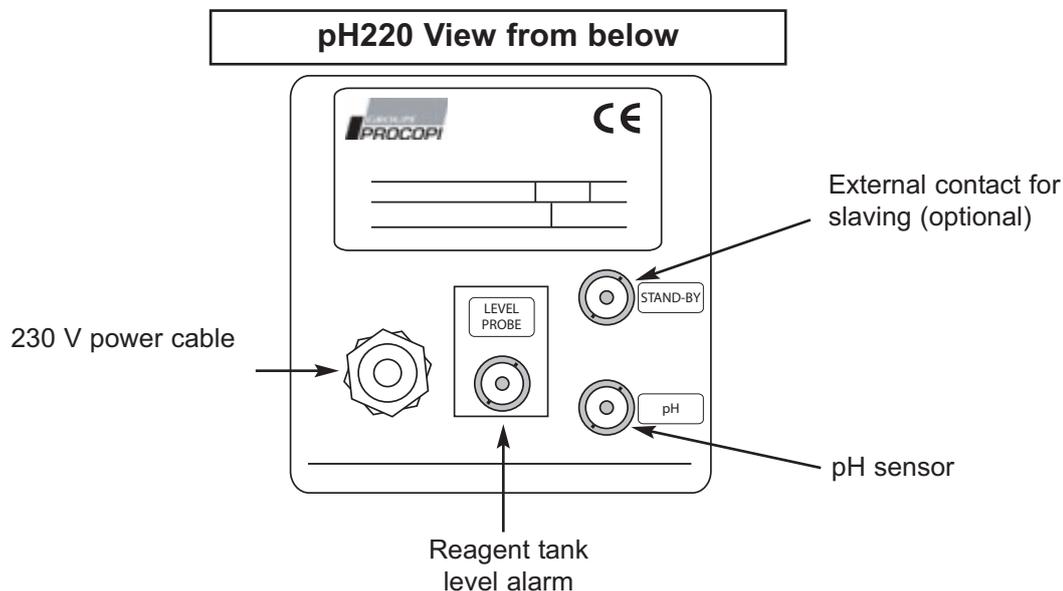
The reagent tanks should be located as close as possible to the pump. They should be covered to prevent the escape of fumes and feature an equalizing vent to avoid depressurisation within the tank.

Maximum suction height is 1.5 m.

**The reagent tank must under no circumstances be installed above the dosing pump.**

Should the elevation of the plant room be above the pool to be treated, install an anti-siphon device (available as an option) to prevent the risk of siphoning from the tank.

## CONNECTIONS



## WIRING AND PROTECTION

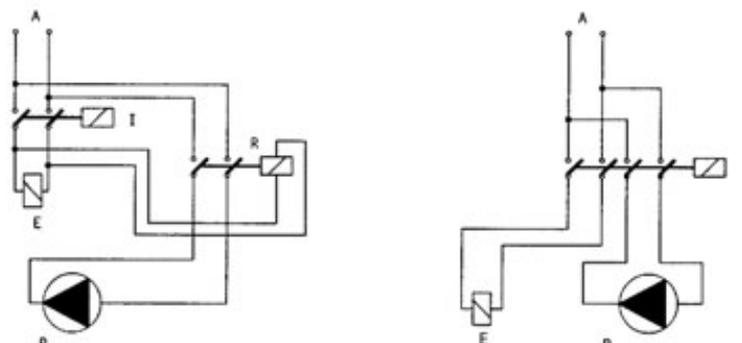
The pump must be connected to a 230 Volt power supply, slaved to pool filtration. Check that earthing has been carried out in accordance with the standards in effect. Ensure that the circuit is protected by a 30 mA differential circuit breaker.

Electrical data:

Voltage: 198 to 242 Vac - 50 Hz - Average consumption 5 Watts.

Never connect the pump directly in parallel with any inductive loads (eg: motor).

P : Dosing pump  
R : Relay  
I : Double pole switch  
E : Motor  
A : Current



## SLAVING

The pH-/220 pump may be slaved to an external dry contact signal connected to the “**STANDBY**” BNC terminal under the pump (for example: pressure gauge, flow controller, etc.) In this configuration, the pump will only run when the contact is active (contact closed).

## PRIMING THE DOSING PUMP

**Before commissioning the dosing pump, the material safety data and toxicology sheet of the reagent used must be read carefully and all recommended safety precautions must be taken.** Once all the tubes have been connected, hold down the **ON/OFF** key. The pump will enter manual mode and will start to run. Open the priming valve on the front of the pump body. When the liquid arrives at the drainage tube, close the valve. release the key, the pump will stop. **This operation should, by preference, be carried out with water.**

## DOSING

All the series pH-/220 dosing pump's technical data is provided on the label affixed to the side of the pump. This information includes the pump model, the power supply voltage, the flow rate and the operating pressure. Dosing and pressure data indicated are valid for a water temperature of 20°C.

## LEVEL ALARM

The series pH-/+220 dosing pump features an end of tank level alarm. The level sensor that comes with the pump should be mounted on the suction strainer (photo below) and connected to the BNC terminal marked "LEVEL PROBE" found underneath the pump. When the level of the reagent in the dosing tank falls under the minimum level defined by the position of the sensor, the pump stops working immediately and the "LEVEL" LED blinks.

Mounting the tank low level sensor on the suction strainer



## DISPLAY PANEL

The display panel comprises two sections:

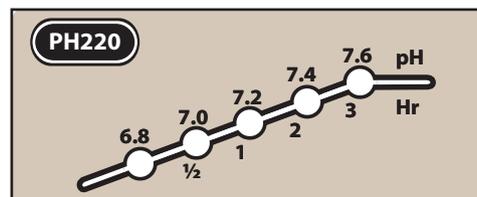
### THE pH/Hr DISPLAY SCALE :

During normal operation, the display indicates the pH of the pool water.

A single LED lit up indicates a pH corresponding to the LED.

When two LEDs light up at the same time, the pH is between the two values indicated. (For example: LEDs 7.2 and 7.4 are lit up: the value detected by the probe is 7.3).

If the LEDs corresponding to 6.8 or 7.6 blink, the value detected is off the scale. (pH below 6.8 or above 7.6).

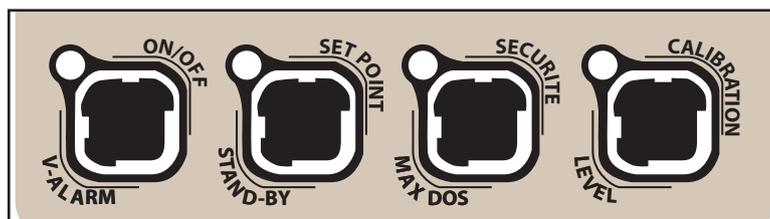


The display during programming can indicate the calibration point, the max dosing alarm or the set point.

When the LEDs light up successively from the bottom to the top, this indicates that the data programmed (calibration, max dosing alarm or set point) has been saved.

### THE KEY PAD:

Each of the keys located under the display panel features two labels and one LED. The label above the key indicates the programming function that may be selected by pressing the key.



The label underneath provides information concerning abnormal operating conditions.

If the LED associated with a key is lit continuously, this indicates that the function indicated has been selected.

If the LED associated with a key blinks, this indicates an alarm.

# KEY PAD FUNCTIONS

## RESETTING PUMP PARAMETERS

In the event of a pump malfunction, the 4 key LEDs blink. The pump needs to be reinitialised. To do this, keep all 4 keys pressed down simultaneously until only 1 LED on the display remains lit up.

**CAUTION, after reinitialising the pump, the various values will need to be reset.**



### ON-OFF KEY - (V-ALARM)

This key is used to activate and deactivate the pump (on/off). In the OFF position, the LED blinks every 5 seconds and indicates that the pump is energised.

### PRIMING / MANUEL DOSING

Hold the **ON/OFF** key down, the pump starts in manual mode to allow priming, checking of the equipment and the hydraulic circuit. Upon releasing this key, the pump reverts to normal operation.

### V-ALARM

If the LED corresponding to this key blinks slowly, the pump is not dosing and there is a problem with the power supply.



### SET-POINT KEY - (STAND-BY)

This key is used to program the set point (the pH value to be maintained). The default value is 7.2. Once the pool water reaches a pH of 7.2, the pump will stop. At a pH of 0.3 above (the pH -220 version) or 0.3 below (the pH +220 version) the set point, the pump will run at 100%, as the pH of the pool water approaches the set point, the pump will dose at increasingly lower levels until it reaches 0% at the set point. To modify the set point proceed as follows:

While in normal operating mode, keep the **SET POINT** key pressed down for 5 seconds. The LED lights up. Press the **ON/OFF** successively to select the value desired.

To save the set point, keep the **SET POINT key** pressed down until the LEDs light up successively from the bottom to the top of the pH/Hr scale.

**The pH-220 version may only be used to dose pH minus to lower the pH of swimming pool water, while the pH +220 version is intended to dose pH plus in order to raise the swimming pool water's pH.**

### STAND-BY

If the pump is connected to an external signal and the signal is active, the pump will stop dosing and will display the pH of the pool water. In this case, the LED will flash.



## SAFETY KEY - (MAX-DOS)

This key allows you to set the maximum dosing time. This function stops the pump after the programmed run time has elapsed in order to prevent overdosing in the event of a malfunction (sensor malfunction, low level in the reagent tank, etc.)

### PROGRAMMING THE MAX DOSING TIME ALARM

Keep the **SAFETY** key pressed down until the LED lights up. The allowed values are expressed in hours and are shown on the pH/Hr display. Press the **ON/OFF** key repeatedly to select the maximum dosing time. To save the setting, keep the **SAFETY** key pressed down until the LEDs on the pH/Hr display light up one after the other starting at the bottom.

Example: if **0** is selected, the dosing alarm is inactive. If **2 Hr** is selected, the pump will stop after 2 hours of continuous operation. \*\*\* As the pump injects a maximum of 2l/h, after 2 hours at most 4 litres of the reagent will have been injected.

The max dosing time should be programmed as a function of the pool water volume.

There are 2 ways to reset the max dosing alarm (**max dos**):

### RESETTING THE MAX DOSING ALARM WITH MODIFICATION OF THE DOSING CYCLE

Hold down the **SAFETY** key. The dosing cycle (expressed in hours) is shown on the pH/Hr display scale. Press the **ON/OFF** to cycle through the allowed values. To save the new setting, keep the **SAFETY** key held down until the LEDs light up one after the other starting at the bottom of the pH/Hr display scale. The pump will restart when a demand is detected.

### RESETTING THE MAX DOSING ALARM WITHOUT MODIFICATION OF THE DOSING CYCLE

Hold down the **SAFETY** key. The dosing cycle (expressed in hours) is displayed on the pH/Hr scale. Release the key. Keep the **SAFETY** key held down again until the LEDs light up one after the other starting at the bottom of the pH/Hr display scale. The pump will restart when a demand is detected.



## CALIBRATION KEY - (LEVEL)

This key is used to calibrate the probe. A pH 7 buffer solution will also be required. To enter Calibration mode, keep the key held down for 5 seconds, the LED lights up. Remove the protective cap from the probe and connect it to the BNC terminal marked "pH" underneath the pump. then plunge the tip of the pH probe into the pH7 buffer solution. Wait 1 minute for the reading to stabilise while stirring the probe gently in the

solution. To save this value, keep the **CALIBRATION** key held down until the LEDs light up successively starting at the bottom of the pH/Hr scale.

The LED that lights up on the pH/Hr scale should correspond to a pH of 7. If this is not the case, press the **ON/OFF** key repeatedly until the LED corresponding to a pH of 7 lights up. To save this setting, keep the **CALIBRATION** key held down until the LEDs light up successively starting at the bottom of the pH/Hr scale.

### LEVEL

If the low level sensor detects a low level in the reagent tank, the relevant LED will flash and the pump will be stopped.

The pump will automatically restart once the reagent tank has been refilled.

## MAINTENANCE

Prior to any pump intervention for maintenance, do the following:

- Cut the power supply,
- Use gloves, safety goggles, a protective mask and any other safety equipment recommended for the safe handling of the reagent.
- Rinse the pump components by pumping clear water through the pump for a few minutes.
- Purge any chemicals that may remain in the tubing, pump head, etc.
- Release the pressure in the return tube.
- Disconnect the suction tube.

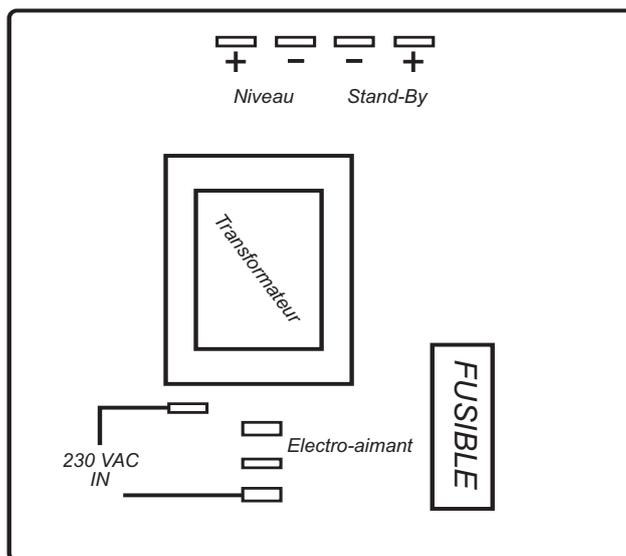
In the event of contact with the reagent during an intervention, follow the instructions on the safety label affixed to the container.

The pH-/±220 pump requires little maintenance. Simply clean the suction tube strainer twice a year. If the reagent used has a tendency to form crystals, this operation should be carried out once a month.

Check the injection rod.

Rinse with clear water.

## WIRING



### EC STANDARDS

All the FPH series electromagnetic pump models are stamped with the EC mark and comply with the following European standards :

EN60335-1 : 1995  
EN55014, EN50081-1/2, EN50082-1/2, EN6055-2, EN60555,3

CEE 73/23 c 93/68 (DBT Low voltage directive) and the 89/336/CEE directive (EMC Electromagnetic compatibility).

## TROUBLE SHOOTING

**IF... the pump does not run and the “ON/OFF” LED flashes every 5 seconds:**

- The pump is stopped. Start the pump by pressing the ON/OFF key.

**IF... the pump does not run and the “ON/OFF” LED does not light up:**

- Check the power supply and power connections.
- Check that the fuse inside the box has not blown.
- Change out the printed circuit board.

**IF... the pump does not run and the “ON/OFF” LED is flashing:**

- Check the pump power supply.
- Check that voltage is compatible with the pump,

**IF... the pump does not run and the “Low Level” LED is flashing:**

- Make sure that there is sufficient reagent in the tank.
- Check that the level contact float is not blocked.
- Remove any depositions that may have formed and that could keep the float blocked in the low position.

**IF... the pump does not run and the solenoid valve is pulsing**

- Check that the filter is not obstructed by impurities or crystals,
- there could be air trapped in the pump body, reprime the pump. (See the section on priming),
- Check that the sampling and injection rods are not blocked,
- Check that o-rings have not been damaged due to incompatibility with the reagent used.

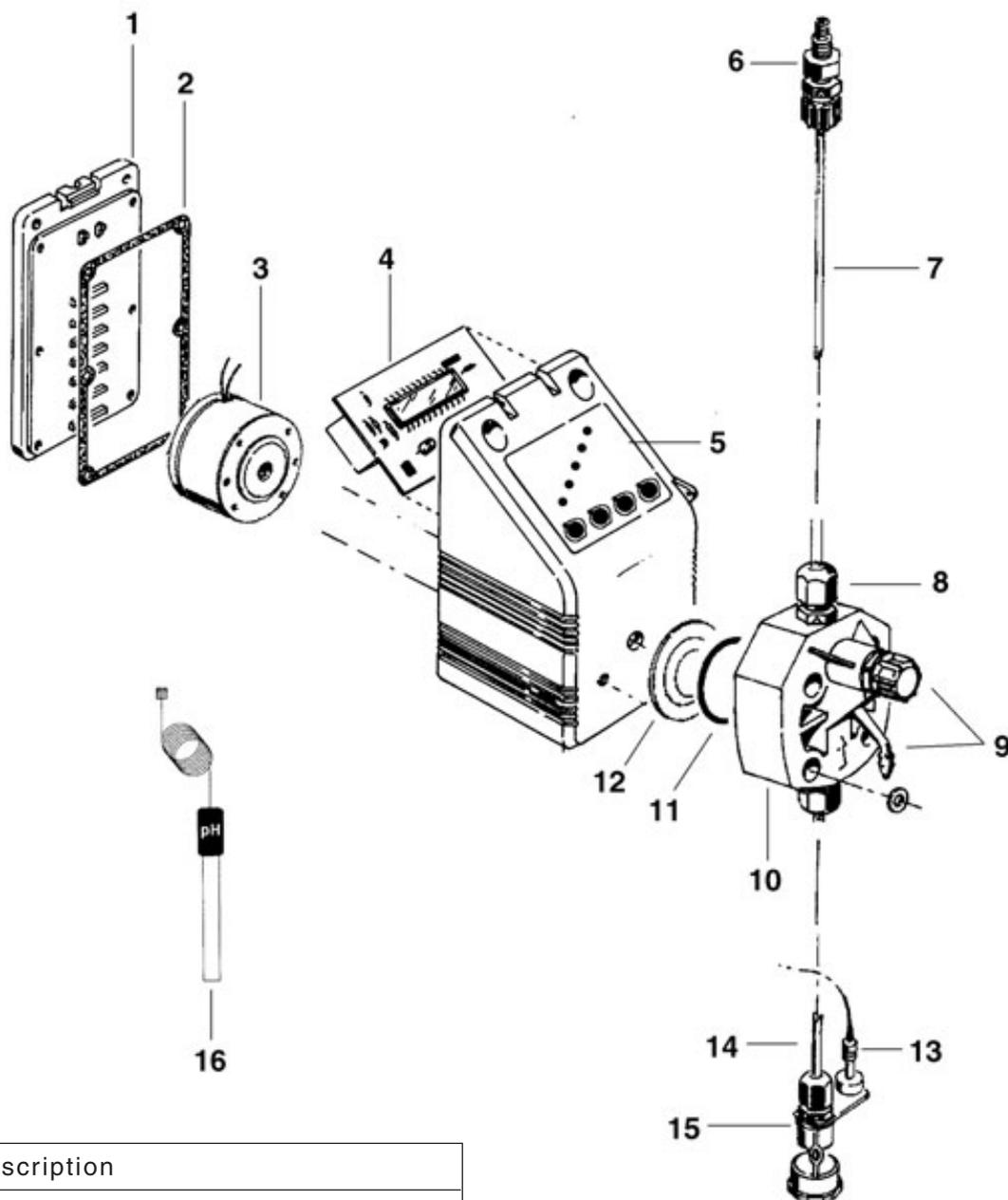
**IF... the pump does not run and the “Standby” LED “ is flashing:**

- The pump is slaved to an external contact that is preventing start up (Pressure gauge, flow-switch, etc.). The pump will start up as soon as the external contact opens.

## TECHNICAL DATA

|                                  |            |
|----------------------------------|------------|
| Maximum suction height           | 1.5 metres |
| Operating temperature            | 0-45 °C    |
| Temperature of the reagent dosed | 0-50 °C    |
| Max pump flow rate               | 2 l/h      |

## EXPLODED VIEW



| N° | Description            |
|----|------------------------|
| 1  | Rear lid               |
| 2  | Rear lid seal          |
| 3  | Solenoid valve         |
| 4  | pH FMSPH circuit board |
| 5  | Control pad            |
| 6  | Injection rod          |
| 7  | Return tube            |
| 8  | Pump body union        |
| 9  | Air purge              |
| 10 | Pump body              |
| 11 | Air purge              |
| 12 | Diaphragm              |
| 13 | Tank low level sensor  |
| 14 | Suction tube           |
| 15 | Filter strainer        |
| 16 | pH sensor              |

# STANDARD INSTALLATION

