

MANUAL

Innowater PHRX





WARNINGS

Before carrying out any installation or maintenance of the pHrx, disconnect it from the mains power supply.

This appliance is not intended for use by persons (including children) that lack experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a responsible person.

The installation of this device should be carried out by a qualified person.

The pH-Basic device should be located in the correct pool zone and connected to supply via a power outlet that is protected by a residual current device (RCD) having a rated residual operating current not exceeding 30mA.

The power outlet should have a degree of protection suitable for the pool zone. Ensure that equipotential bonding of all parts of the pool installation is carried out.

During the installation phase of the pHrx, check the following:

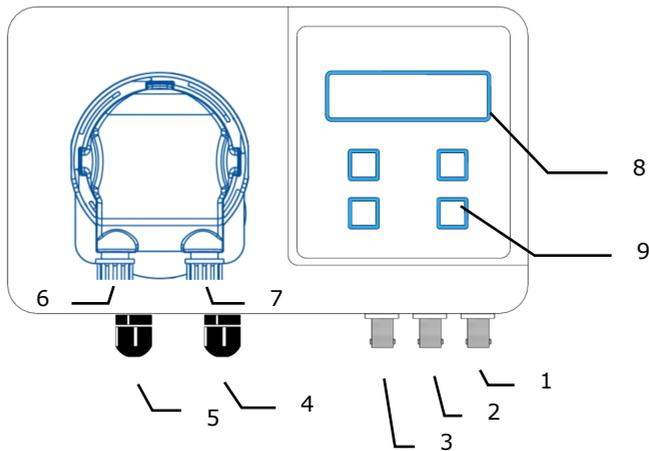
- the voltage of the power supply must be the voltage indicated on the side of the appliance
- the injection point pressure must be lower than 1.5 Bar
- the peristaltic pump's protection cover must be correctly fitted
- the suction tube must be immersed in the corrective solution container with the suction tube also connected to the peristaltic pump (left side).
- the injection tube must be connected on one side to the peristaltic pump (right side) and on the other side to the pool return pipe via the injection valve.

Innowater Tratamientos Integrales del Agua S.L. will not be held liable for the use of this device with inappropriate products.

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1. DESCRIPTION

The pHrx allows you to correct the pH and ORP level of your pool. The device monitors the pH continuously by means of its pH sensor and sends a dosing signal to the pump which will, in turn, inject acid in the pool when needed. The device will control the work of the pump depending on the measurement of the probe and the setpoints programmed. To avoid excessive dosage related to measuring delays, the pump will alternate start/pause periods in cycles of 100 seconds. It also monitors the ORP thanks to its probe and then, when needed, sends a signal to activate an oxidant doser/producer device.



1. BNC socket for pH probe
2. BNC for pH level probe
3. BNC socket for ORP probe
4. 230 VAC power supply
5. ORP control cable
6. Connection for suction tube
7. Connection for injection tube
8. LCD Display
9. Buttons

2. INSTALLATION

Controller

Install the device on the wall in easy to access location using the braquet provided. Before attaching the bracket to the equipment, use the bracket to mark in the wall the location of the holes you will need to make for the screws. Choose a location close to the injection point.

pH and ORP probes

Install the probes after the filter and BEFORE the chlorinator cell and as far as possible from it. Try to choose a point in the circuit that never get empty of wáter, because the probe deteriorates quickly when dry.

Injection

Install the clamp provided in the return pipe after all other equipment (pump, filter, heater, chlorinator etc.). It should be the last element on the return line. Install the injection one way valve on the clamp. Use Teflon tape to seal the thread. Connect the injection rigid tubing (opaque) to the valve.

Connect the other end of the injection tube (opaque) to the injection fitting (right side) of the peristaltic pump.

Suction

Connect the flexible suction tube (transparent) to the injection fitting (left side) of the peristaltic pump.

Use a length of tube long enough to reach from the acid container to the peristaltic pump and feed the tube through the black rubber grommet in the 'anti-fume' cap. Once the cap is on the tube, fit the suction filter to the suction tube and place the suction line into the acid container. Screw the anti fume cap down into position.

Acid container

We strongly recommend to place the acid container outside the filter shed. If it is not possible, ensure the adequate ventilation is provided and place the container as far from metallic and electronic equipment as possible and NEVER underneath the pump or other device.

Level probe

Attach the end of the cable from level probe that carries the float to the suction filter using the supplied bracket. Connect the other end of the cable to the BNC connector of the device. Immerse the suction filter together with the level probe that you have fixed to into the acid container and make sure that it stands upright and stable on the bottom. Close the container as good as you can.

ORP control cable output

Control cable provides a dry contact to control the device. Depending on the setpoint configured it can generate a proportional PWM duty cycle or an ON/OFF signal.

If the device controls a saltwater chlorinator, setpoint must be configured as an ON/OFF signal.

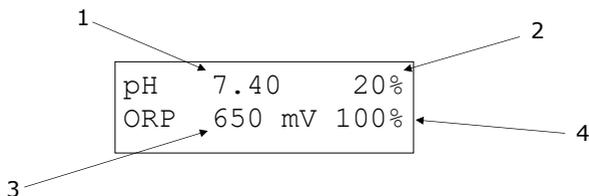
Connect the cable to the external control input of the chlorinator or use it to activate a relay or other device.

If you use the cable to switch a voltage, do not exceed the following values :

Maximum voltage	230 VAC
Maximum current	1 A

3. User interface

3.1 Main screen

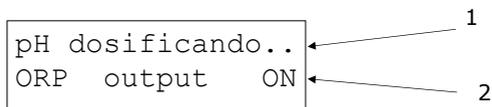


Main screen shows the following info:

- (1) pH measure
- (2) Acid dosage percentage, calculated from the setpoints
- (3) ORP measure
- (4) ORP dosaje percentage, calculated from the setpoints

3.2 Secondary screen

By pushing **Λ** or **V**, secondary screen appears:



This screen shows the current status of ORP output and pH pump:

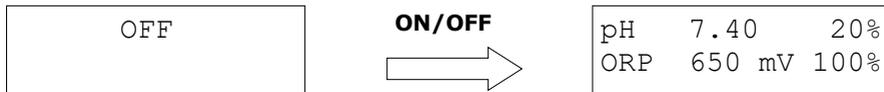
- (1) pH Dosing: Pump working to lower the pH value
 Pause: Pump paused because of working cycle
 Stopped: Pump stopped (pH below or equal to setpoint)
- (2) ORP output ON: Closed contact (ORP below of setpoint)
 output OFF: Open contact (ORP equal or above setpoint)

To go back to main screen push arrow (**Λ** or **V**) key.

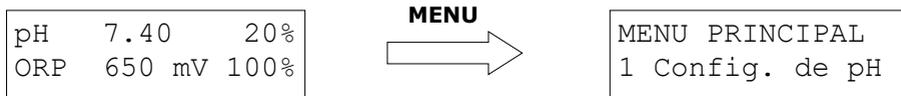
3.3 Start up— ON/OFF

To turn on the equipment press **ON/OFF (MENU)** for two seconds. Main screen will appear.

To turn OFF, from the main screen, press **ON/OFF (MENU)** for two seconds.

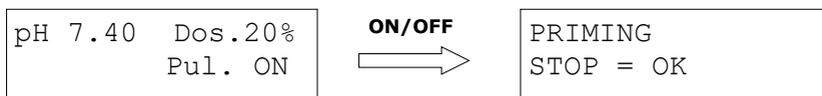


Press Menu to access to the main menu. Use the arrows to scroll the different functions. Press OK to enter in each sub-menu.



3.4 Start up. Priming pH pump

To start the pump manually press "OK" for two seconds while in the main screen.



Acids are very corrosive and can harm your eyes, skin and airways. Always wear safety goggles, gloves and clothing and provide a safe means to evacuate the priming acid.

Press OK to stop the priming process, if don't it will automatically return to main screen in 60 seconds.

Level alarm (PH pump)

If the float drops down due to a lack of acid in the acid tank, the level alarm will be activated and the pump will stop dosing. This is indicated by a beep and the message "EMPTY TANK" on the display.

-Fill the tank and the pump will be activated and working again.

-The manual activation of the pump by means of OK key, keeps on enabled even in the level alarm.

-If you want to Switch Off the level alarm, simply disconnect the Level probe from the device.

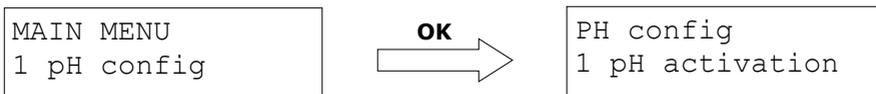
4. PH CONFIGURATION AND CALIBRATION

To access the Configuration Menu, press the OK key from the main screen and scroll with the help of the arrows.

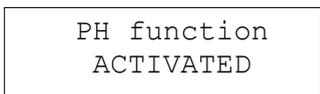
4.1 Enable/disable pH function

You can enable or disable pH function in menu **1. pH Config.**

Push OK to get into pH configuration sub-menu and use arrows to scroll through the options:

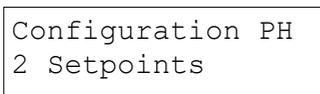


To access the pH Activation Menu, press the **OK** key.

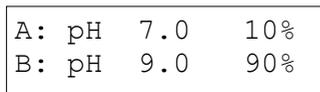


Use arrows **▲** o **▼** to choose and press **OK**

4.2 Setpoint configuration



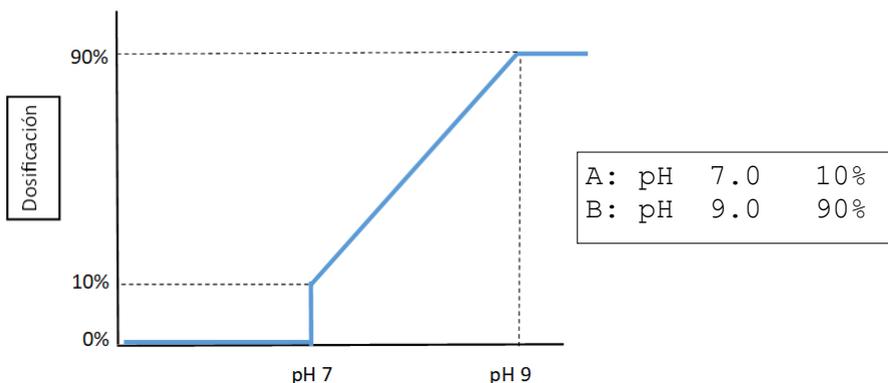
Enter with the **OK** key. It will show the following screen:



The calculation of the dosage is made by establishing the two set points, A and B, and the relative volume of dosage that is required in each of these points.

- When the pH is below the lower set point, the pump will not dose acid.
- When the pH is between both points, the chlorinator will send a proportional signal defined by both points. For example, in the case of the figure, if the pH is at 8 the pump will dose at 40%.

- When the pH is above the upper set point, the pump will dose to the fixed volume defined for the upper point. In the case of the figure, 90%.



You can set both points and choose the percentage of dosage for each of them. To do this, press the cursor with the **MENU** key in the parameter you want to modify and act with the arrows to change the value.

Press **OK** to save the data and exit the sub-menu.

By choosing the set points you will be defining at the same time the required dosing volume and the response delay after dosing, both of them depending on the size of your pool. For example, if your pool has a high volume you should establish high percentages of dosing. The response time in the pH measurement of your pool can be considered when setting point A of the setpoint, stopping the dosage before reaching the desired pH value. For example, to obtain a pH = 7.0 and avoid overdosing, set the dosage stop in a higher value:

A: pH 7.2 0%

Each pool needs more or less acid, as they are more or less reactive to the dosage, at the beginning at least, you may need to correct the set points several times.

4.3 y 4.4 pH probe calibration

```
pH configuration  
3 Cal pH 4
```

```
pH configuration  
4 Cal pH 7
```

The pH probes require a calibration before their first use and then they need to be calibrated periodically. It is because different probes can have different answers and because the response of the same probe inevitably varies with time. The calibration consists of measuring the response of the probe introducing it in two buffer solutions and recording this response in order to deduct the pH of any other solution, in our case, the pH of the pool water.

The calibration of the probe is carried out using the two buffer solutions supplied (pH4 and pH7) and entering the submenus "**3 Cal pH4**" and "**4 Cal pH7**" respectively.

Enter the sub-menu **3 Cal pH 4** by pressing **OK** key, it will show the following screen:

```
Calibration pH 4  
Lec: 4.05 4.00
```

The value on the left (**Lec:**): indicates the current pH value measured by the probe.

The value on the right indicates the value of the buffer pH4 solution. You can adjust this value using the arrows to adapt it to the temperature and the sample used.

Insert the probe in the buffer solution at pH 4, remove it slightly with the probe and wait for a stable reading value to be reached.

Once the reading value has stabilized press the **OK** key to save the calibration and exit the sub-menu.

Next, remove the probe from the buffer solution pH 4, rinse its bottom with clean water and shake gently to remove excess water.

Repeat the above process with the buffer solution pH 7 and submenu **4 Cal pH 7**.

Note: If in the pH calibration process, the measure valued of the probe, **Lec**, differs by more than 2 units from the theoretical value of the buffer solution (pH4 or pH7), the calibration of that point won't be saved and it will go back to Factory values.

For example, if when calibrating with the pH4 solution the reading value, **Lec**, indicates 6.05, the calibration won't be saved and the value 4.00 will be maintained.

4.5 Factory calibration

```
pH configuration  
5 Factory calib.
```

The submenu **5 Factory calib**, gives you the possibility to reset general calibration parameters that correspond, approximately, with those of a new probe and which are the ones programmed by the chlorinator from factory values. This can be useful if you have saved successive calibrations and do not have the buffer solutions for a correct calibration.

Press **OK** key to enter the sub-menu **5 Factory calib**, it will show the following screen:

```
Factory calib.?  
YES:OK EXIT:MENU
```

Press **OK** key to set Factory values or **MENU** to Exit.

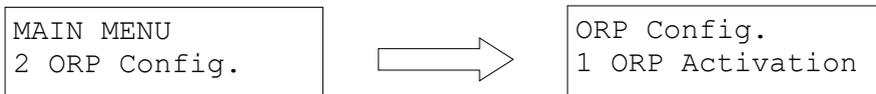
4.6 Dosing alarm

```
PH Configuration  
6 Dosing alarm
```

Press OK to enter. To activate or deactivate scroll with arrow keys to choose ON or OFF. Then press MENU to set the period desired (up to 20 minutes)

```
Dosing alarm OFF  
Max. Dos. 20 min
```

5. ORP CONFIGURATION AND CALIBRATION



To access the 2 ORP Config., press **MENU** key, then scroll with the help of the arrows.



To enter ORP Activation press OK, choose Activated or Deactivated and press OK.

ORP control cable output

The control cable provides a voltage-free contact between its two wires. Depending on the configuration of the setpoints this contact can generate a signal with a variable work cycle (PWM) proportional to the measurement, or an ON/OFF signal. To use this cable to control a Chlorinator, configure the output in ON/OFF mode.

Connect the cable to the external control input of the Chlorinator or connect it to operate with a relay or other device.

If you use the cable to switch a voltage, do not exceed the following values:

Maximum admissible voltage 230 VAC

Maximum admissible current 1 A

If percentage, when calculated, is different of 0% or 100%, contact will open and close according to a variable work cycle (PWM) in cycles of 100 seconds. For example, if the calculated dosage is 40%, contact will remain closed (ON) during first 40 seconds and open (OFF) for the rest 60 seconds.

Current status of this contact is shown permanently on display. When turning on the device, it will wait for the ORP value to stabilize so, although dosage is at 100%, ORP output will remain OFF for a period of time. Also, the device has an hysteresis to avoid fast changes and rebounds.

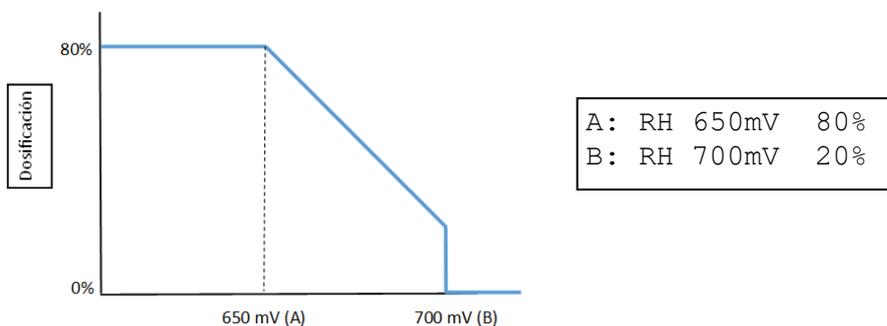
5.1 Setpoint

ORP Config.
2 Setpoints

To enter press OK, it will show the following screen:

A: RH 650mV 80%
B: RH 700mV 20%

The calculation of the production is made by setting of two setpoints, A and B, and the % of production that is desired for each of those points.



- When the ORP is below the lower set point, the signal will work at its maximum frequency.
- When the ORP is between both points, the chlorinator will send a proportional signal defined by both points. For example, in the case of the figure, if the ORP is at 675 mV the pump will dose at 50%.
- When the ORP is above the upper set point, the equipment will keep the output OFF, at 0%.

You can set both points and choose the percentage of dosage for each of them. To make this, press cursor with the **MENU** key in the parameter you want to modify and scroll with the arrows to change the value. Press **OK** key to save the data and Exit the sub-menu.

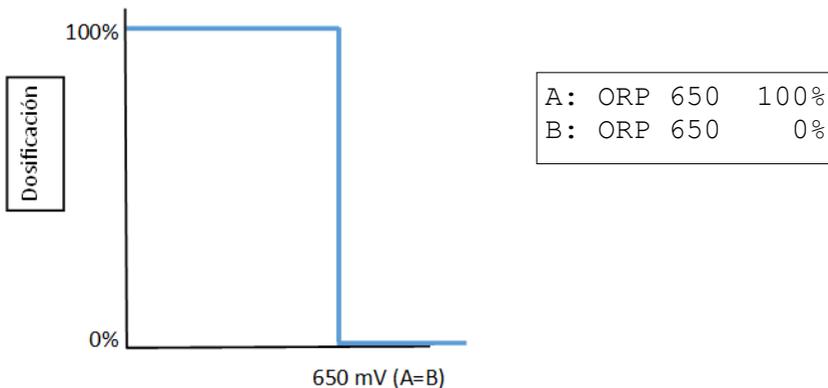
By setting the set points you will be defining at the same time the % of production desired in each of those points, both dependent on the size of your pool. For example, if your pool has a high volume you should establish high production percentages. The response time in the measurement of the ORP of your pool can be considered when establishing the set point B by cutting the signal before reaching

the desired ORP value. For example, to obtain an ORP = 750mV and avoid overproduction, set the dosage cut to a somewhat lower value:

B: ORP 730mV 0%

We recommend to make periodic recalibrations of the ORP electrode.

5.2 "ON/OFF" mode TO WORK WITH A SALT WATER CHLORINATOR



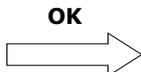
If you set the same ORP value in both points and dosage in A is 100%, output will behave as a "ON/OFF" signal:

- When ORP is below the value, output will remain ON (closed contact)
- If ORP is above the value, output will remain OFF (open contact)

5.2.1 To work with a domestic INNOWATER salt water chlorinator, you have to set the following parameters in the chlorinator:

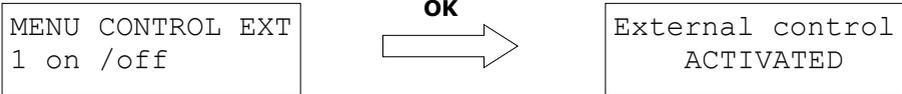
Enter "Control Ext" in the main menu:

```
MAIN MENU
5 Control Ext
```

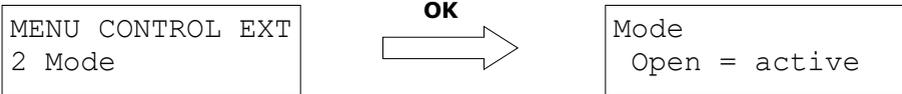


```
MENU CONTROL EXT
1 ON/OFF
```

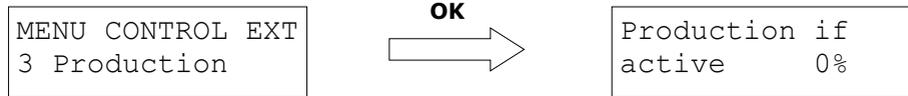
Activate external control:



In "2 mode", choose the option "Open = active":

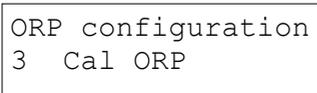


In "3 Production", set 0%:



This way, when chlorinator receives the order to produce chlorine, it will do it at the percentage chosen from the main screen. If the order is not to produce, it will remain at 0%.

5.3 Probe calibration

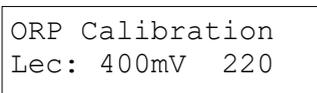


The ORP probes require a calibration before their first use and then they need to be calibrated periodically. It is because different probes can have different answers and because the response of the same probe inevitably varies with time.

The calibration consists of measuring the response of the probe introducing it in two buffer solution and recording this response in order to deduct the ORP (RH) of any other solution, in our case, the ORP (RH) of the water in the pool.

The calibration of the probe is carried out using a buffer solution supplied (220mV) and entering the sub-menu "**3 ORP Calib.**".

Enter the sub-menu **3 ORP Calib.** by pressing **OK** key, it will show the following screen:



The value on the left (**Lec:**): indicates the current ORP (RH) value measured by the probe. The value on the right, indicates the value of the buffer solution (220mV). You can adjust this value using the arrows to adapt it to the temperature and the sample used.

Insert the probe in the buffer solution 220mV, remove it slightly with the probe and wait for a stable reading value to be reached.

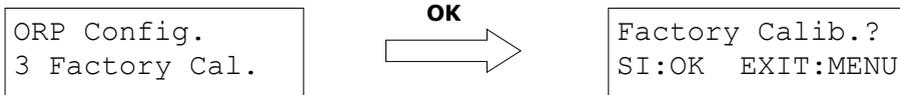
Once the reading value has stabilized press **OK** key to save the calibration and exit the sub-menu.

Next, remove the probe from the buffer solution 220mV, rinse its bottom with clean water and shake gently to remove excess water.

5.4 Factory calibration

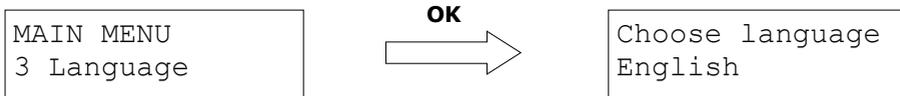
The submenu **Factory calib**, gives you the possibility to reset general calibration parameters that correspond, approximately, with those of a new probe and which are the ones programmed by the chlorinator from factory values. This can be useful if you have saved successive calibrations and do not have the buffer solutions for a correct calibration.

Press **OK** key to enter the sub-menu **5 Factory calib**, it will show the following screen:



Press **OK** key to set Factory values or **MENU** to Exit.

6. Language



Press **OK** key to enter and scroll with the help of the arrows to choose the desired language.

Press **OK** key to confirm and Exit.

7. Contrast LCD



Press **OK** key to enter and scroll with the help of the arrows to choose the desired LCD contrast.

Press **OK** key to confirm and Exit.

