MP225

PH/ORP CONTROLLER
WITH BUILT-IN CHEMICAL FEED PUMPS

INSTRUCTION MANUAL

WARNING: this manual contains important information about the installation and the operation of the instrument. These instructions must be followed at all times in order to prevent damage to persons and property

CE

GENERAL SECURITY INFORMATION

DANGER!

In the event of an emergency will be necessary to turn off the power and disconnect the pump immediately.

In case of aggressive chemical products manipulation, it is needed to follow the Regulation and Terms of Use strictly, as well as the recommendations of the manufacturer.

If the equipment is installed outside European Community, please follow the local Regulation and Terms of Security

The manufacturer cannot be held responsible for any damage to persons or property in case of a wrong installation or use of the equipment.

CAUTION!

The equipment should be installed in an easily accessible place. Do not block the place where the equipment is installed.

It is advisable to install an interlock device to block automatically the equipment in case of no-flow.

Qualified staff must carry out the assistance and maintenance of the equipment.

The fittings of the tubes must be disconnected before any manipulation.

It is advisable to empty and to wash the tubes that are in contact with aggressive chemical products. Safety systems must be used for this purpose.

Pay special attention to the chemical characteristics of the product to be dosed.

TABLE OF CONTENTS

WARNING: it is completely prohibited the use of this equipment with radioactive products.

CAUTION: it is needed to follow the rules of the manufacturer for handling any chemical product such as: glasses with flexible support, chemical coat, chemical goggles, etc. Direct contact with chemical products must be avoided at all times.

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INTRODUCTION

The MP225 is an electronic system to control pH and ORP. It is based in the latest technology microprocessors with an advanced user display, which offer high performance and reliability.

The equipment has 2 high-performance peristaltic pumps specifically designed to work with pH and ORP chemical products. Once the set point is properly configured, the system is able to start the pumps to correct the detected deviations.

There are several password protected programming menus to change the behavior of the system. It is possible to control and to prioritize the dosages of the pH and ORP chemical products in order to dose the required amount of product and to adapt to every kind of installation.

The equipment has 2 entries of product level, one for pH and another for ORP, which allow blocking the required pump when there is no product.

The equipment also has a “Standby Mode” associated with a voltage-free input. It is possible to specify the amount of time that the equipment will remain in this mode, during which product dosages will be blocked.

In order to guarantee a proper product dosage, the equipment comes with an input to connect a flow sensor. There are different possible configurations for this input to allow the system to dose only when this sensor is in an active state. This way a lot of product will be saved and the system will never dose in an idle state.

It is possible to set a maximum dosage time for each pump. An alarm will be generated after this time and optionally the pump will be stopped.

The system will automatically detect a possible error in the probe and will offer the possibility to block the pump to prevent any dosage.

TECHNICAL FEATURES

MC225 is specifically designed for pH and ORP control in a simple and economic way. Some of its highlights are:

- Electronic system based in a high reliability microprocessor.
- LCD display for a fast and intuitive visualization of all the parameters of the system.
- Wide measurement range.
- High-performance and self-priming peristaltic pumps which offer the maximum compatibility with chemical products.
- Easy installation thanks to its optimized design casing.
- Simple and fast start up thanks to its system of menus.

TECHNICAL SPECIFICATIONS

Power supply: 105VAC-230VAC 50/60Hz.

International Protection Rating: IP 65

Main fuse: 2AL – 250V

Pump fuse: 315mA – 250 V

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INSTALLATION

INSTALLATION INSTRUCTIONS

For a proper installation please follow the instructions below:

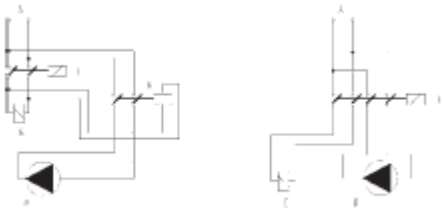
1. The equipment must be installed in a safe and accessible place.
2. It should be firmly fixed in order to keep it from moving.
3. The maximum suction height is 1.5m.
4. Suction and injection tubes must be placed in order to avoid curves that could block the flow of the products.
5. Tubes connections must be perfectly connected to the corresponding fittings.
6. Tubes must be compatible with the chemical product to be used.
7. It is important to verify the grounding connection.
8. If the grounding connection is not enough, it is needed to install a differential switch with a minimum sensitivity of 0.03A.
9. The voltage of the power supply must be within the limits of the equipment: 105VAC-230VAC / 50-60Hz.

The equipment includes an installation kit:

Probe holder
Collar fitting
BNC Coaxial connection
Buffer solution pH4
Buffer solution pH7
Buffer solution 650mV

Valve 1/2"
Foot filter with ring and valve
Suction tube
Injection tube
Wall plug M 6
Screw M 6
Double faston

The equipment must never be connected in parallel with and inductive load (e.g. engines) to avoid possible damage to it. In order to achieve this it is needed to use a relay. Please follow next recommended schemes:



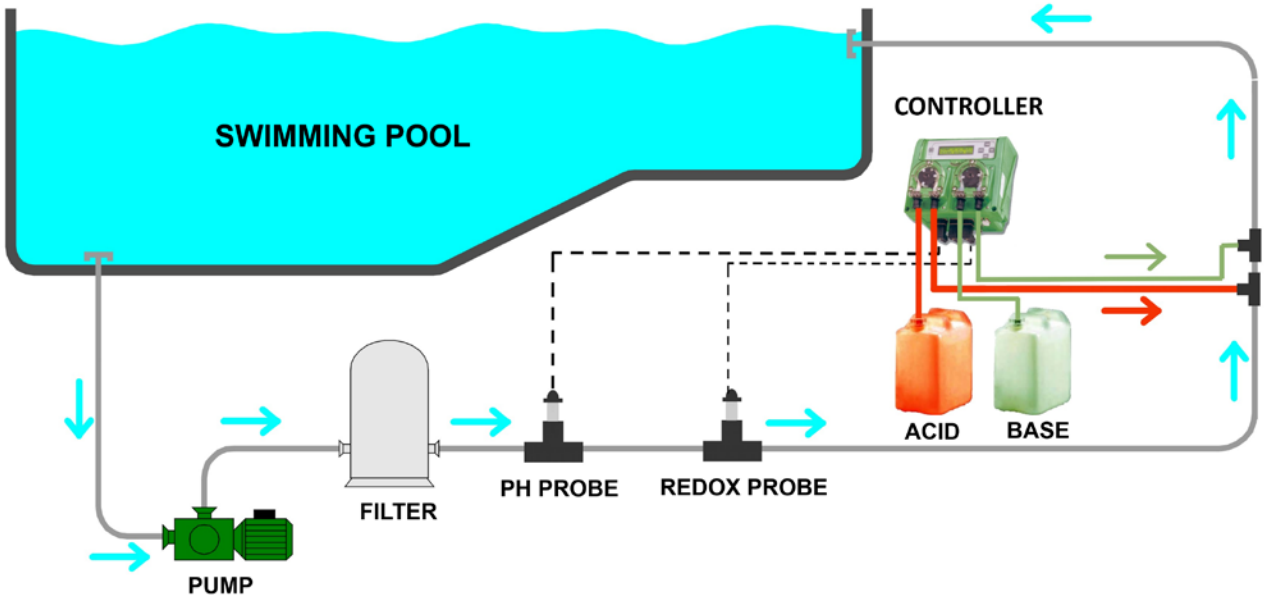
P - Dosing pump
R - Relay
I - Safety switch
E - Solenoid / Inductive load
A - Power supply

The equipment has 3 fuses inside: one for the power and two more for the dosing pumps. Please follow next steps for replacement:

1. Disconnect the equipment from the electricity network.
2. Remove the screws from the front of the pump.
3. Open and remove the front cover straight. Do not try to turn or pull down the cover.
4. Open the fuse holder: press and turn clockwise through one-quarter turn.
5. Replace the blown fuse for another with similar characteristics.
6. Close the fuse holder: press and turn counter-clockwise through one quarter turn.

INSTALLATION DIAGRAM

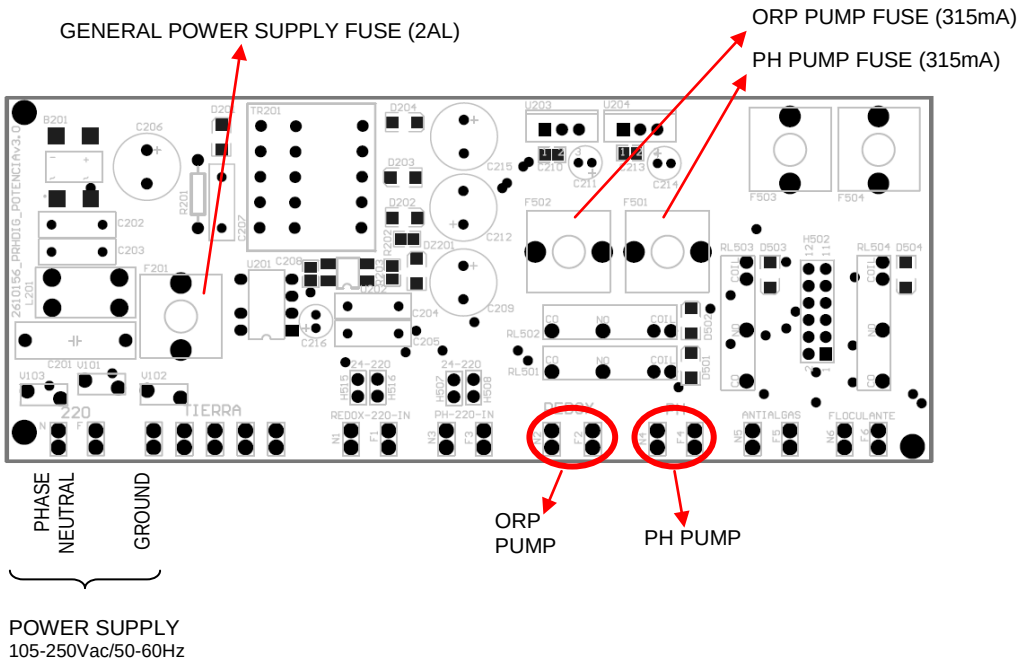
The picture below shows the recommended installation diagram for the equipment:



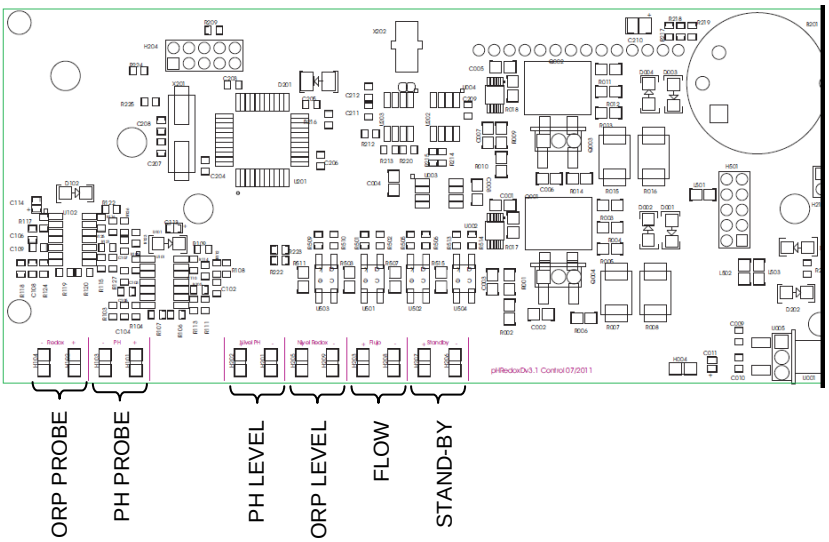
ELECTRIC CONNECTIONS

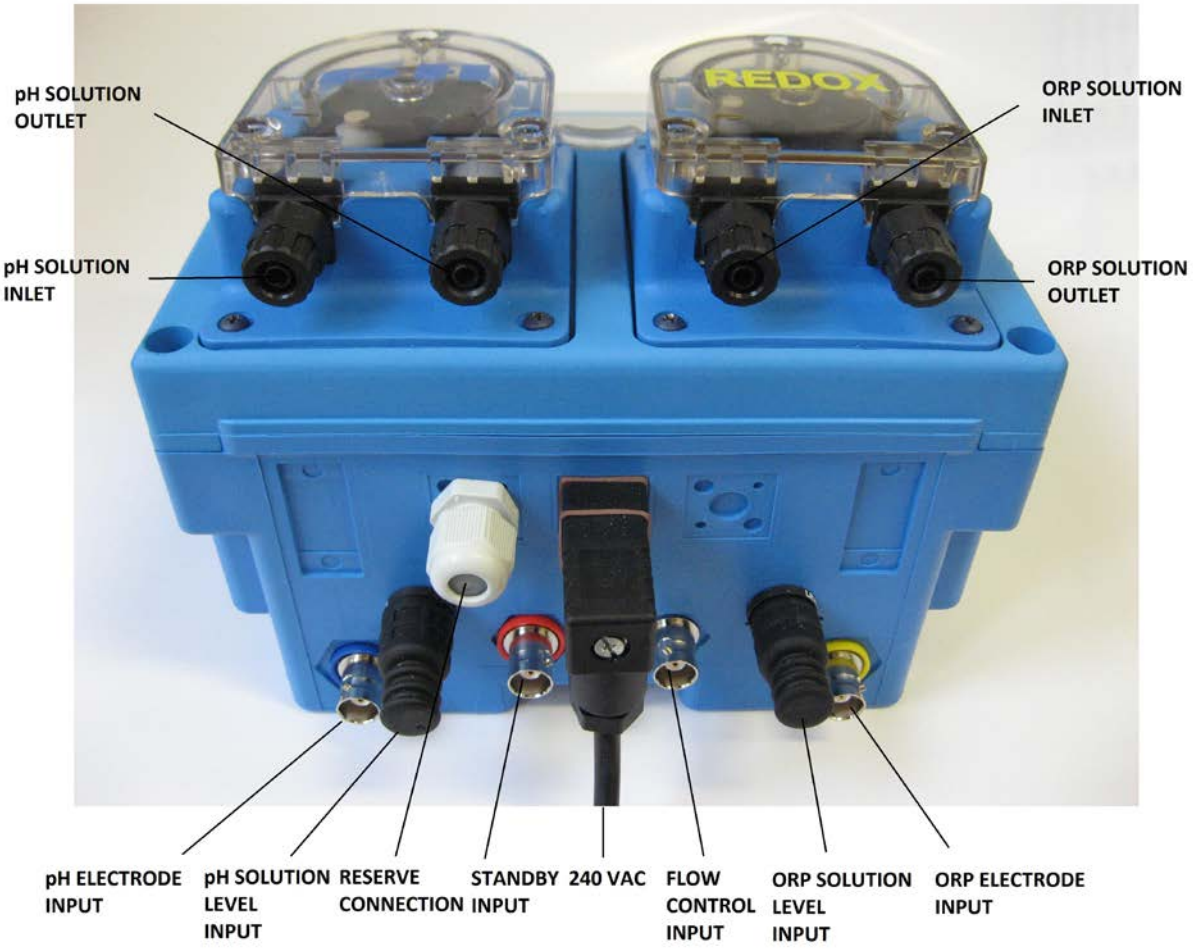
The MCXXX equipment consists of 2 electronic boards connected to each other by a connector. The internal electric connections are:

POWER CIRCUIT



CONTROL CIRCUIT





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PROGRAMMING

PROCESS CONTROL

The MC225 equipment has been especially designed for pH and ORP control applications in the same installation. The equipment is able to start the pumps in order to keep the desired pH and ORP levels of the installation thanks to the configured set points.

There is the possibility to establish a maximum dosing flow if the equipment has pumps with adjustable flow volume. This way the equipment can adapt to the requirements of the installation to be installed.

The equipment has 2 probes for the measurement of pH and ORP especially designed for a double purpose. The calibrating function is independent for each probe in order to achieve the highest possible accuracy in the measurement of both products.

The pH and ORP configuration set points are:

- ***Target point*** (0%-OFF-XOFF): it is the value to keep in the desired range.
- ***Maximum deviation point*** (100%-ON-XON): when this point is reached, the associated pump will dose at its full potential.

When the level is between both points, the equipment will dose proportionally. Once the equipment reaches the target point, it will stop. If the maximum deviation point is reached, then the pump will dose at full potential.

There are separate programming menus to configure the set points of pH and ORP. In status menus 1 and 2 it is possible to see the speed of the dosing pumps in relation to the configured set points. In case of an alarm situation, this one would show instead of “%” of the pump speed.

The dosing set points are completely configurable. Here is a description of the different possibilities:

- ✓ **PH DOSAGE:**
  - o **0%-100%** → the flow of the pump will be used to comply with the configured set points. The closer the value is from the target point the lower the flow of the pump will be. The minimum flow can't be modified but the maximum flow is configurable through the different programming menus and can be different from the one established for the ORP pump.
  - o **ON-OFF** → the configured set points will be reached using a work cycle. The equipment uses a default work cycle of 100 seconds; the amount of time the pump is working will increase from 0 seconds (when the target point is reached) to 100 seconds (when the maximum deviation point is reached).
  - o **XON-XOFF** → this mode forces the pump to work in an "all or nothing" way. When the measurement deviates from the target point, the pH pump starts and stops again when the target point is reached. The pump will start when the maximum deviation point is reached again, starting a new dosing cycle.
  - o **pH priority** → this option is only available for pH. If it is set to "PR=ON" the ORP dosage will be blocked until pH reaches its target point. If it is set to "PR=OFF" the ORP pump works regardless of pH value.
  - o **Acid/Base control** → the type of product to dose is automatically selected depending on the value of the target point and the maximum deviation point:
    - Acids → target point lower than maximum deviation point.
    - Bases → target point higher than maximum deviation point.

- ✓ **ORP DOSAGE:**
  - o **0%-100%** → the flow of the pump will be used to comply with the configured set points. The closer the value is from the target point the lower the flow of the pump will be. The minimum flow can't be modified but the maximum flow is configurable through the different programming menus and can be different from the one established for the pH pump.
  - o **ON-OFF** → the configured set points will be reached using a work cycle. Using a work cycle of 100 seconds, the amount of time the pump is working will increase from 0 seconds (when the target point is reached) to 100 seconds (when the maximum deviation point is reached).
  - o **XON-XOFF** → this mode forces the pump to work in an "all or nothing" way. When the measurement deviates from the target point, the pH pump starts and stops again when the target point is reached. The pump will start when the maximum deviation point is reached again, starting a new dosing cycle.

There are several additional functions to achieve the maximum adaptability to all the installations:

- ✓ **MAXIMUM DOSAGE TIME:** this time can be configured independently for pH and ORP. For all the configuration menus, it is possible to establish a maximum dosage time during

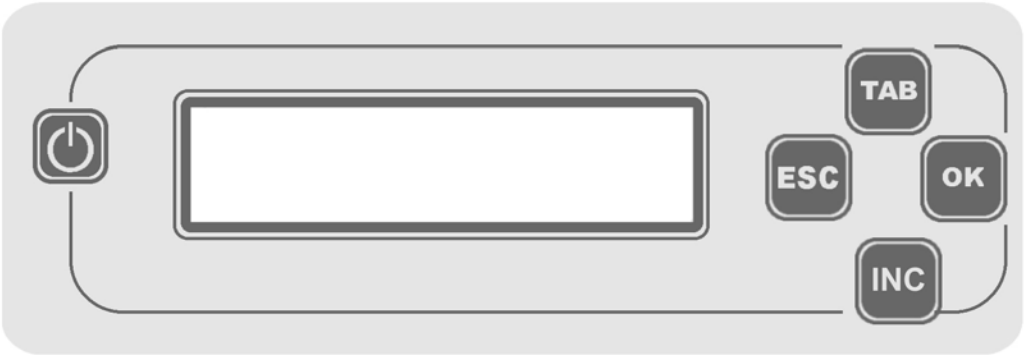
which the target point must be reached. If this point is not reached, an alarm situation will be generated and there is the possibility to stop the corresponding pump.

- ✓ **DOSING FLOW:** this feature can be configured independently for pH and ORP. For all the configuration menus, it is possible to establish a maximum dosing flow if the equipment has adjustable flow pumps. 100% is the nominal flow of the pump and 10% the minimum possible value.
- ✓ **DOSAGE CYCLE:** this feature can be configured independently for pH and ORP. In this menu it is possible to establish 2 parameters:
    - o Tf: amount of time during which the pump works.
    - o Tp: amount of time during which the pump remains idle.

  The pump works during the time configured in "Tf' and remains idle during the time specified in "Tp". If the equipment should not dose during the time defined in "Tf", the pump will also remain idle during this dosing time.
- ✓ **LEVEL CONTROL:** the equipment has 2 normally open free voltage entries of level to detect the absence of any of the products. In this case the corresponding pump will be stopped to prevent the loss of prime.
- ✓ **STAND-BY:** there is one normally open free voltage entry to generate the "Stand-by" signal. This signal is able to stop the dosage of both pumps, plus a possible adjustable period of time. This signal is also attached to an initial stop time of the pumps, just after the equipment has been connected to the general power supply. Once this period of time is over, the pumps will be able to dose again. All this options are under the menu "STAND-BY/FLOW".
- ✓ **FLOW:** the equipment has one entry to connect a sensor flow with free voltage contact output. This can be configured as normally open, "NO"; normally closed, "NC"; or "OFF" to deactivate the flow signal. If this signal is not active the pumps will remain idle, if the signal is active the pumps will dose again if necessary. It is possible to configure an additional time after which the pumps will remain blocked just after the flow signal is activated. This is the same parameter as the "Stand-by" option and it is configured in the same menu.
- ✓ **PROBE FAILURE:** it is possible to configure a programmable time to control the state of the probe. An alarm will be generated in the case that the measurement of the probe remains with the same value during that time. There is the possibility to stop the dosage of the associated pump.

USER INTERFACE

This is the control panel of the equipment:



The interface has a high luminance display to show data clearly. There are also 4 keys to navigate through the status and programming menus:

- "**TAB**" → to scroll through menus and the different parameters of a certain programming menu.
- "**INC**" → this key has a double function:
    - Allows accessing programming capabilities from status menus.
    - Allows modifying the selected parameter on a certain programming menu.
- "**OK**" → to accept the modified values in this menu.
- "**ESC**" → to exit the programming menus.

The key  allows jumping from standby mode to operating mode. These two modes are described in depth next.

WORKING MODES

A welcome screen is showed when the equipment is connected to the power supply. This screen indicates the version of the microprocessor software and during this time all the exits will remain deactivated and the keyboard disabled. The screen looks like this:

```
RPH-PRO
v1.0.58
```

After this first screen it is showed the first system screen where it is possible to visualize the different parameters of the equipment.

The equipment has 2 working modes:

- ***STANDBY MODE*** → the equipment is on and it is possible to visualize the status menus and the status of the different signals. It is also possible to access to the programming menus to visualize and change parameters. PH and ORP measurements can be visualized in real time on the screen. In this mode the pumps will always be stopped and it is possible to know if this mode is active accessing status menu 1 and see if text "OFF" is showed in the second line.
- ***OPERATING MODE*** → the equipment is fully operational and all status and programming menus can be accessed. In this mode both pumps are ready to dose when necessary.

To change between both working modes it is needed to press "ON/OFF" key during 5 seconds. If the pumps are working and the standby mode is selected, these ones will be blocked.

STATUS MENUS

This menu is shown just a few seconds after the initial menu. "TAB" key is the one to use to navigate through the different screens.

STATUS MENU 0	14.00pH 1854mV ↓100% ↓100%	All the pH and ORP information is shown in the same screen. 1st row: pH and ORP measurement. 2nd row: dosage ratio (%) for pH and ORP. The arrow indicates the direction of the dosage. *In case that exist an alarm situation for one of the products, the value of its dose will be replaced for a descriptive text of that alarm.*

STATUS MENU 1	**14.00pH 0%14.00** **↓100% 100%12.00**	PH control information. 1st row: pH measurement / target point. 2nd row: dosage ratio (%) (Or alarm text) / Maximum deviation point. The arrow indicates the direction of the dosage: increasing or decreasing the pH value. *In case that exist an alarm situation for one of the products, the value of its dose will be replaced for a descriptive text of that alarm.*
STATUS MENU 2	**1854mV 0%1700** **↓100% 100%1900**	ORP control information. 1st row: ORP measurement / target point 2nd row: dosage ratio (%) (Or alarm text) / Maximum deviation point. The arrow indicates the direction of the dosage: increasing or decreasing the ORP value. *In case that exist an alarm situation for one of the products, the value of its dose will be replaced for a descriptive text of that alarm.*
STATUS MENU 3	**pH:Tf01s Tp0000s** **rH:Tf01s Tp0000s**	Shows the parameters configured for pH and ORP dosage cycles.
STATUS MENU 4	**pH:TmaxDos=0000s** **rH:TmaxDos=ALARM**	Shows the maximum dosage times for pH and ORP. When one of these configured times is reached, the seconds will be replaced by a blinking “ALARM” text. If the key “OK” is pressed the alarm situation and the timer-counters will be restarted.
STATUS MENU 5	**LEVEL pH: OK** **LEVEL rH: ALARM**	Shows the state of both pH and ORP levels. If everything is fine the text “OK” is shown. If the entry level is active the blinking text “ALARM” is shown. The “ALARM” situation will not be restarted until the product level is recovered.
STATUS MENU 6	**STDBY=OFF DELAY:** **FLOW=OFF 00000s**	Shows the state of the standby and the sensor flow signals, as well as the timing associated to both signals and to the beginning of the power. The status of the signals are shown like this: “OFF” → the signal is not active. “ON” → the signal is active.
STATUS MENU 7	**PROBE pH: OK** **PROBE rH: ALARM**	Shows the state of both probes. The “ALARM” situation will occur when the measurement of the probe does not vary during the programmed time. When the key “OK” is pressed the “ALARM” situation will be restored, the pumps will be unblocked and the probes will return to “OK” status. Now the programmed time to detect the error of the probe is shown again.

STATUS MENU 8	***MANUAL MODE** P:pH T:0000s	Shows the pump that has been manually activated and the remaining time to stop.

ACCESS TO PROGRAMMING

It is possible to access to the programming menus pressing the "INC" key from any of the status menus. Next screen is shown:

```
> CONFIGURATION
  MANUAL
```

There are two options to select using the "TAB" key:

- *Configuration mode* → allows modifying the parameters of the equipment. It is only possible to access here with the master password.

- *Manual mode* → allows starting a certain pump during a period of time. It is possible to access here with the user or master password.

Next screen ask for the user or master password depending on the mode selected.

```
*** PASSWORD ***
      0000
```

MANUAL MODE

This is the screen for the manual mode:

```
***MANUAL MODE**
  P:pH T:0000s
```

This menu has 2 parameters:

- '**P**' → allows starting the pH or ORP pump.
- '**T**' → allows selecting the amount of seconds during which the pump will be working.

After pressing the "OK" key the pump works during the given time. In the corresponding status menu the "%" symbol is replaced by the text "Man". If the "ESC" key is pressed rather than "OK" key then any pump is activated. It is not possible to start both pumps at the same time from this menu.

The pump always works at full speed when is selected from this menu.

CONFIGURATION MENUS

The general structure of the configuration menus is next:

1. pH CONFIG
   - 1.1. pH Set-Point
   - 1.2. pH Calibration
   - 1.3. pH TMaxDos

1.4. pH Flow
1.5. pH Cycle
1.6. pH Probe
2. rH CONFIG
2.1. rH Set-Point
2.2. rH Calibration
2.3. rH TMaxDos
2.4. rH Flow
2.5. rH Cycle
2.6. rH Probe
3. STDBY-FLOW
4. PASSWORD
5. LANGUAGE
6. RESET
7. EXIT

The key “>” is used to select the desired menu option and the “OK” key to access to that menu. The “ESC” key is used to exit from one menu without modifying any parameters.

Inside the different menus, the cursor shows what parameter is going to be modified. The “TAB” key allows navigating through the parameters and the “INC” key changing the current value.

Pressing the “OK” key, current parameters are temporally saved. To confirm and store permanently these changes is necessary to select option “SAVE” in the “EXIT” menu. All changes will be lost if option “IGNORE” is selected in “EXIT” menu.

It is only possible to give up the programming menu from the option “EXIT”.

A description of each of the programming menus is listed below:

<table>
<tr><td colspan="3">1.pH CONFIG</td></tr>
<tr><td>1.1.pH Set-Point</td><td>0%:10.00pH PR:
100%:11.00pH OFF

OFF:10.00pH PR:
ON:11.00pH OFF</td><td>Allows configuring the pH set point. There are 5 possible parameters:
- 0%-OFF → indicates the way the dosage is done:
o 0% → speed mode
o OFF → start-stop mode
o XOFF → all-nothing mode
- Target point → pH value of the first row.
- 100%-ON → this value automatically changes with the first parameter.
- Maximum deviation → pH value of the second row.
- PR: “ON” activates the dosage priority for pH; in this case the pump associated to ORP is blocked until the pH set point is reached. “OFF” allows ORP pump to dose freely.</td></tr>
<tr><td>1.2. pH Calibration</td><td>Calib1: 04.00pH
14.00pH

Calib2: 07.00pH
14.00pH

Error message:
PH CALIB ERROR!
CHECK PROBE!</td><td>PH probe is calibrated in two steps:
- Calib1 → the first calibration point is set to 4.00pH by default, allowing the user to modify it.
- Calib2 → the second calibration point is set to 7.00pH by default, allowing the user to modify it.
It is mandatory to set both calibration points; otherwise the configuration is not updated.
If the equipment detects an excessive deviation from the desired calibration value and the one the probe is measuring, a message error is shown.

 
WARNING
For more information, please check “Calibration procedure” later in this manual.</td></tr>
<tr><td>1.3.pH TMaxDos</td><td>PH TMaxDos: 00m
STOP</td><td>Shows the configuration of the maximum dosage time alarm for the pH pump. There are 2 parameters:
- TmaxDos → maximum dosage time.
- STOP/DOSIF → if “STOP” is selected, the pump will be stopped after reaching the previous time. If “DOSIF” is selected, the pump will keep dosing anyway.</td></tr>
<tr><td>1.4.pH Flow</td><td>FLOW pH
100%</td><td>Allows configuring the maximum flow of the pH pump. This value must be between 10% and 100%.
If it is attempted to set a different value, an error message will be shown.</td></tr>
</table>

1.5.pH Cycle	**CYCLE PH** **Tf=00s Tp=00m**	Indicates the cycle time for the pH pump. If just one of the parameters is set to zero, this function is considered as disabled and the pH pump will dose freely.
1.6.pH Probe	**PROBE pH** **t:00m DOSIF**	Allows configuring some parameters to detect a possible failure in the probe: - **t:00m** → maximum time before which the pH measurement must fluctuate within the range previously established; otherwise the pH probe alarm will be activated. - **"DOSIF"/"STOP"** → allows selecting if the pump associated to the pH probe must be stopped or kept dosing if a failure is detected.
2. rH CONFIG		
2.1.rH Set-Point	**0%:1100mV** **100%:1000mV** **OFF:1100mV** **ON:1000mV** **XOFF:1100mV** **XON:1000mV**	Allows configuring the ORP set point. There are 4 possible parameters: - **0%-OFF** → indicates the way the dosage is done: o 0% → speed o OFF → start-stop o ON-XOFF → all-nothing - **Target point** → rH value of the first row. - **100%-ON-XON** → this value automatically changes with the first parameter. - **Maximum deviation** → rH value of the second row.
2.2.rH Calibration	**Calib: 0650mV** **1400mV** *Error message:* **RH CALIB ERROR!** **CHECK PROBE!**	Allows calibrating the ORP probe. It is done in just one step: - **Calib** → the calibration point is set to 650mV by default, allowing the user to modify it. The value is recorded pressing the "OK" key. If the equipment detects an excessive deviation from the desired calibration value and the one the probe is measuring, a message error is shown.  ***WARNING*** *For more information, please check* ***"Calibration procedure"*** *later in this manual.*
2.3.rH TMaxDos	**RH TMaxDos: 00m** **STOP**	Shows the configuration of the maximum dosage time alarm for the ORP pump. There are 2 parameters: - **TmaxDos** → maximum dosage time. - **STOP/DOSIF** → if "STOP" is selected, the pump will be stopped after reaching the previous time. If "DOSIF" is selected, the pump will keep dosing anyway.

2.4.rH Flow	**FLOW RH** **100%**	Allows configuring the maximum flow of the rH pump. This value must be between 10% and 100%. If it is attempted to set a different value, an error message will be shown.
2.5.rH Cycle	**CYCLE RH** **Tf=00s Tp=00m**	Indicates the cycle time for the ORP pump. If just one of the parameters is set to zero, this function is considered as disabled and the ORP pump will dose freely.
2.6.rH Probe	**PROBE RH** **t:00m DOSIF**	Allows configuring some parameters to detect a possible failure in the probe: - **t:00m** → maximum time before which the ORP measurement must fluctuate within the range previously established; otherwise the ORP probe alarm will be activated. - **"DOSIF"/"STOP"** → allows selecting if the pump associated to the ORP probe must be stopped or keep dosing if a failure is detected.
3.STDBY-FLOW	**STDBY EXT:OFF** **SFLOW:OFF t:00m**	Shows the parameters related to "Stand-By" and sensor flow: - **STDBY EXT:OFF** → enables ("ON") or disables ("OFF") the timing after the standby signal. - **SFLOW:OFF** → selects the type of contact of the sensor flow: o **NA** → contact normally open. The signal is active when the contact is closed. o **NC** → contact normally closed. The signal is active when the contact is open. o **OFF** → disables the sensor flow entry. Does not interfere with the normal functioning of the pumps. - **t:00m** → additional time after the standby or sensor flow signal disconnection during which both pH and ORP pumps will stay idle.
4.PASSWORD	***** PASSWORD ***** **MA:0000 US:0000**	Allows modifying both passwords: - **MA** → master. Allows accessing to the programming and manual mode. - **US** → user. Allows accessing only to the manual mode. The "OK" key updates the new passwords.
5.LANGUAGE	***** LANGUAGE ***** **> ENGLISH**	Allows selecting the desired language.
6.RESET	**RESTART** **CONFIGURATION?**	If the "OK" key is pressed in this screen, all the parameters will be restored to factory defaults. If the "ESC" key is pressed, nothing is saved.

7.EXIT	**DISCARD** **SAVE**	If the “DISCARD” option is selected, temporary changes will be lost. If the “SAVE” option is selected, temporary changes will be permanently saved in the equipment.

CALIBRATING PROCEDURE

The recommended procedure to calibrate the pH and ORP probes is listed below.

✓ **PH CALIBRATION:**

The procedure for calibrating the pH probe must be as follows:

1. Clean the probe with plenty of water.
2. Access to the calibration menu. The default point will be shown: 7.00pH.
3. Adjust the calibrating menu value (first row) to the buffer solution value to be used.
4. Immerse the pH probe in the corresponding buffer solution.
5. Wait 10 seconds until the equipment stabilizes the measurement.
6. Move the cursor (“>”) to the second line.

WARNING
If the “OK” key is pressed while the cursor (“>”) is in the first line, the calibration process is finished and all the parameters are ignored.

7. Press the “OK” key so the equipment saves temporally the data of the first point.
8. If the previously steps have been correctly completed, the equipment will show the screen to calibrate the second point; the default value is 4.00pH.
9. Adjust the calibrating menu value (first row) to the buffer solution value to be used.
10. Immerse the pH probe in the corresponding buffer solution.
11. Wait 10 seconds until the equipment stabilizes the measurement.
12. Move the cursor (“>”) to the second line.

WARNING
If the “OK” key is pressed while the cursor (“>”) is in the first line, the calibration process is finished and all the parameters are ignored.

13. Press the “OK” key so the equipment does the calculation to perform calibration. There are 2 possibilities:
    a. ***Correct calibration***: data entered and probe measurement is consistent and the equipment is able to record these values permanently.
    b. ***Calibration error***: there are 2 options:
        i. The equipment detects that the probe has an excessive deviation and is not possible to calibrate it. A replacement of the probe is recommended.
        ii. Data entered is not consistent. Please repeat the entire process from step 1.

    In either case, calibration process is not performed and an error message will be shown.

14. Remove the probe from the buffer solution and connect it to the final installation.

WARNING:
- **Please follow above steps carefully. Any variation in the process may result in the equipment not working properly.**
- **Calibration process must be performed through buffer solutions in good condition; otherwise probe measurements will not be correct.**

✓ ORP CALIBRATION:

The procedure for calibrating the ORP probe must be as follows:

1. Clean the probe with plenty of water.
2. Access to the calibration menu. The default point will be shown: 650mV.
3. Adjust the calibrating menu value to the buffer solution value to be used.
4. Immerse the ORP probe in the corresponding buffer solution.
5. Wait 30 seconds until the equipment stabilizes the measurement.
6. Move the cursor (“>”) to the second line.

WARNING
If the “OK” key is pressed while the cursor (“>”) is in the first line, the calibration process is finished and all the parameters are ignored.

7. Press the “OK” key so the equipment does the calculation to perform calibration. There are 2 possibilities:
    a. ***Correct calibration***: data entered and probe measurement is consistent and the equipment is able to record these values permanently.
    b. ***Calibration error***: there are 2 options:
        i. The equipment detects that the probe has an excessive deviation and is not possible to calibrate it. A replacement of the probe is recommended.
        ii. Data entered is not consistent. Please repeat the entire process from step 1.

    In either case, calibration process is not performed and an error message will be shown.
8. Remove the probe from the buffer solution and connect it to the final installation.

WARNING:
- **Please follow above steps carefully. Any variation in the process may result in the equipment not working properly.**
- **Calibration process must be performed through buffer solutions in good condition; otherwise probe measurements will not be correct.**

WARRANTY

These instruments are warranted from all defects in materials and manufacturing for a period of two years from the date of purchase. The electrode is warranted for a period of 6 months.
If during this period, the repair or replacement of parts is required, where the damage is not due to negligence or erroneous operation by the user, please return the parts to either dealer or our office and the repair will be effected free of charge.
Note: We reserve the right to modify the design, construction and appearance of our products without advance notice.

THANK YOU FOR CHOOSING

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