



This manual contains safety information that if ignored can endanger life or result in serious injury. They are indicated by this icon.



Keep the instrument protected from sun and water.  
Avoid water splashes.



## OPERATING INSTRUCTIONS FOR "LDPRC" INSTRUMENT



Read Carefully !



ENGLISH Version

R12-09-19



NORME CE  
EC RULES(STANDARD EC)  
NORMAS DE LA CE

Direttiva Bassa Tensione  
Low Voltage Directive  
Directiva de baja tensión

2014/35/UE

Direttiva EMC Compatibilità Elettromagnetica  
EMC electromagnetic compatibility directive  
EMC directiva de compatibilidad electromagnética

2014/30/UE



## GENERAL SAFETY GUIDELINES

### Danger!

In emergencies the instrument should be switched off immediately! Disconnect the power cable from the power supply!

When installing always observe local regulations!

Manufacturer is not liable for any unauthorized use or misuse of this product that may cause injury, damage to persons and / or materials.

### Caution!

Instrument must be accessible at all times for both operating and servicing. Access must not be obstructed in any way!

Feeder should be interlocked with a no-flow protection device to automatically shut-off the pumps when there is no flow!

Pumps and accessories must be serviced and repaired by qualified and authorized personnel only!

Always discharge the liquid end before servicing the instrument!

Empty and rinse the liquid end before work on a pump which has been used with hazardous or unknown chemicals!

Always read chemical safety datasheet!

Always wear protective clothing when handling hazardous or unknown chemicals!

Instrument must be operated / serviced by trained technicians only!

All connection operations must be performed while the instrument is not connected to main supply!

## 1. Introduction

LDPRC is a microprocessor based digital regulator for pH and Chlorine with temperature and ORP reading. On/Off, impulsive proportional, proportional PWM or fixed PWM are main working modes. Pulses per minute can be set for outputs. Working ranges are: pH : from 0 to 14pH - Chlorine: from 0 to 10 mg/l - ORP (mV): from 0 to 1000mV. All information are provided through a large LCD display. Using a revolutionary wheel control the instrument can be easily programmed. LDPRC is housed in a IP65 plastic box.

### INPUTS:

- Stand-by
- Flow
- pH (+) level
- pH (-) level
- Chlorine level
- pH probe
- Chlorine probe
- ORP (mV) probe
- Temperature probe

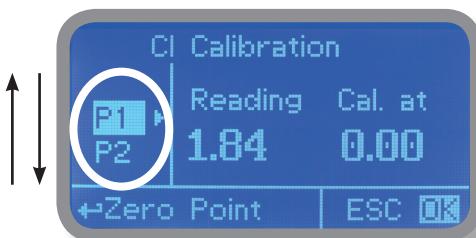
### OUTPUTS:

- 2 relay outputs (pH and Cl)
- 3 opto coupled pulses outputs (pH and Cl)
- Main alarm

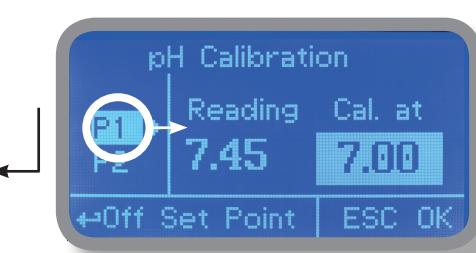
## 2. The wheel

Located in the upper right side of LDPRC there is a wheel that must be used to control the instrument. Wheel can be rotated in both directions to scroll over the menus and / or pressed to confirm highlighted selection / value.

NOTE: Once changes are made press "OK" to save and exit from submenu. Press "ESC" to exit without saving.



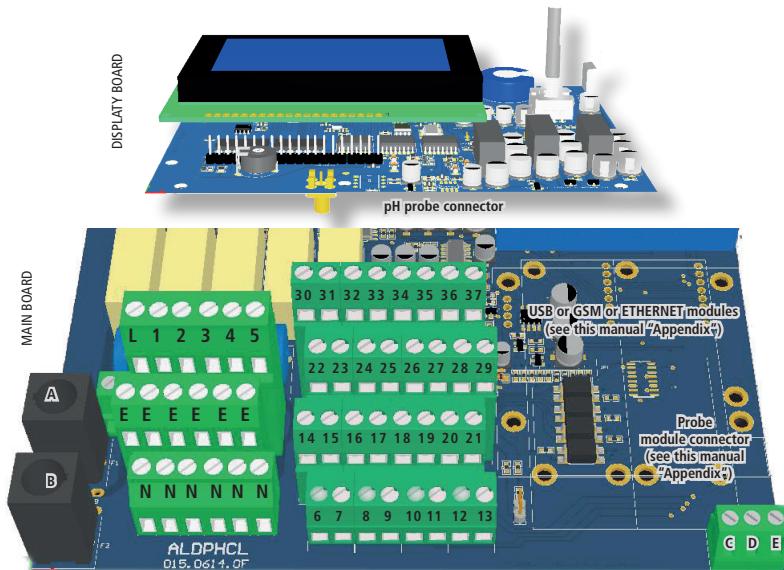
Rotate wheel to scroll through menus or options



Press wheel to select highlighted option

### 3. Mainboard Connections

Unplug instrument from main power supply then perform connections by following the above picture.



A: Main Fuse (6A T)

B: Instrument Fuse (3.15A T)

L(Live) - E(Earth) - N(Neutral): 85÷264VAC - 50/60 Hz

1(Live) - E(Earth) - N(Neutral): 85÷264VAC - 5A 50/60 Hz Relay 1 Output "CH1 PH RELAY". To use with ON/OFF or PWM device  
2(Live) - E(Earth) - N(Neutral): 85÷264VAC - 5A 50/60 Hz Relay 2 Output "CH2 CL2 RELAY". To use with ON/OFF or PWM device

3(Live) - E(Earth) - N(Neutral) : 85÷264VAC Alarm output

31(-) - 30(+): Current output mA1 for pH

31(-) - 32(+): Current output mA2 for Cl

34(-) - 33(+): Current output mA3 for ORP

34(-) - 35(+): Current output mA4 for temperature

Max resistive load: 500 Ohm (on selected model only)

22(-) - 23(+): Output "CH1 PH PULSE 2" (with photocoupler). For dosing pumps "IS" o "MF" series

24(-) - 25(+): Output "CH2 CL2 PULSE" (with photocoupler). For dosing pumps "IS" o "MF" series

26(-) - 27(+): Output "CH1 PH PULSE 1" (with photocoupler). For dosing pumps "IS" o "MF" series

21(GND) - 28(+RS485) - 29(-RS485): RS485

14(+ Brown) - 15(Black) - 16/17(- Blue ; GND): Proximity sensor mod. "SEPR"

11(-) - 10(+): Standby contact

11(-) - 12(+): Chlorine Level contact

19(-) - 18(+): pH Level 1 contact

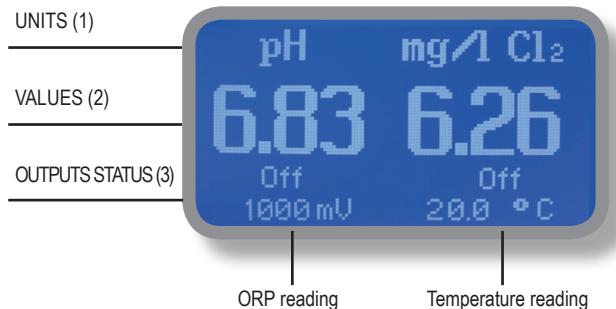
19(-) - 20(+): pH Level 2 contact

6(Green) - 7(Brown) - 8(White) - 9(Yellow): PT100 temperature probe (remove resistors if present before to install)

Warning: Connections must be performed by qualified and trained personnel only.

## 4. Main Screen

When into normal operating mode, LDPRC shows the following main screen:



Main screen is divided int 3 zones.

(1) UNITS.

"pH" is the measuring unit for pH probe.

"mg/l" is the measuring unit for Chlorine probe.

"mV" is the measuring unit for ORP probe.

(2) VALUES

These numbers are values read by the probes.

(3) OUTPUTS STATUS

These fields are related to current outputs status and instrument activity. For more information rotate the wheel when into main screen. (see next page)

Note: the word "PUMP" as shown into this manual refers to a "dosing device" connected to the instrument!

## 5. Quick status check

From main screen **completely rotate clockwise** the wheel to review main instrument parameters and current status conditions.



Status	
Hour:	06 :00
Date:	01/Jan/09
pH:	6.79
Cl:	6.26

System time and date  
pH probe reading  
Chlorine probe reading



Status	
mV:	1022
Temperature:	00.0 °C
Dos. Alarm:	NO
Probe Fail:	NO

ORP probe reading  
Temperature probe reading  
Dosing alarm condition  
Probe failure status



Status	
Flow:	YES
Level:	NO
Cal.pH Fail:	YES
Cal.pH day:	00/Jan/00

Flow contact status (SEPR)  
Tanks Level status  
Last pH calibration result  
Last pH calibration date



Status	
Cal.Cl Fail:	YES
Cal.Cl day:	00/Jan/00
Cal.mV Fail:	YES
Cal.mV day:	00/Jan/00

Last Chlorine calibration result  
Last Chlorine calibration date  
Last ORP calibration result  
Last ORP calibration date



Status	
Cal.Temp Fail:	YES
Cal.Temp day:	00/Jan/00

Last Temp. calibration result  
Last Temp. calibration date

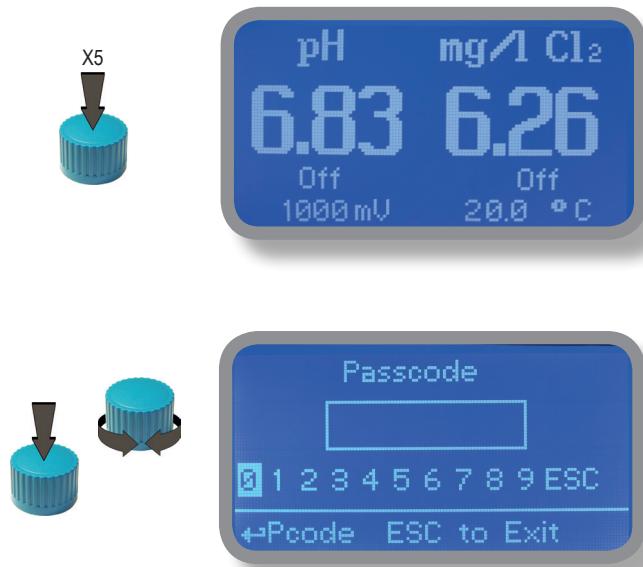


Output Status	
Pulse pH1:	OFF
Relay pH2:	OFF
Pulse pH3:	OFF
Pulse Cl1:	OFF
Relay Cl2:	OFF

**Outputs Status**  
See mainboard at page 4 for connections.

## 6. Password

To grant access into "Main Menu" press the wheel from main screen and enter the passcode.  
If this is the first time here then the passcode is 0000 (factory preset). Press wheel 5 times to enter into "Main Menu".  
Otherwise press the wheel 1 time and enter the passcode. Numbers can be selected rotating the wheel.



To set a new passcode choose "PARAMETERS" from "Main Menu", move on "New Pcode", click on wheel and enter a four numbers code. Click on "EXIT" and choose "YES" to save request. The new passcode is now ready.

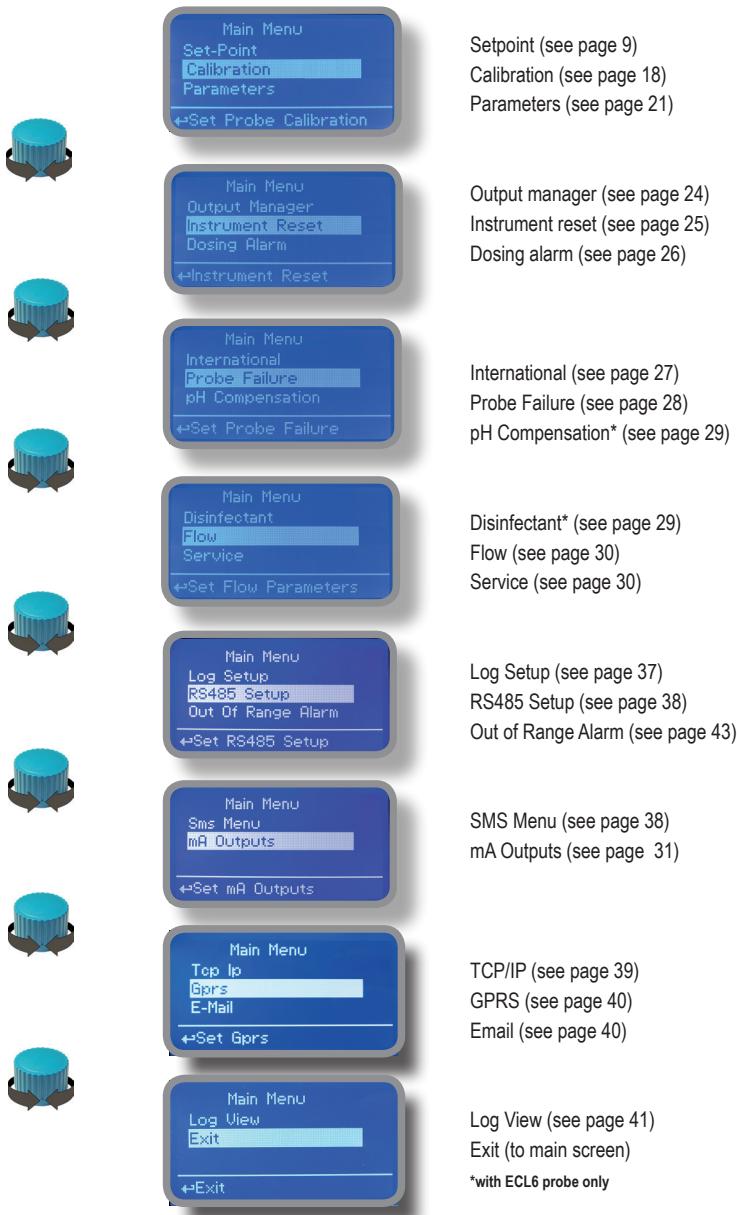


### Lost passcode ?

Please don't forget the passcode (if changed). In the unfortunate event, please call your local distributor for unlocking procedure. There is no way for you to recover lost passcode.

## 7. "Main Menu" list

To grant access into "Main Menu" enter the passcode (as described in previous chapter). Once into "Main Menu" rotate the wheel to scroll through all the options available.



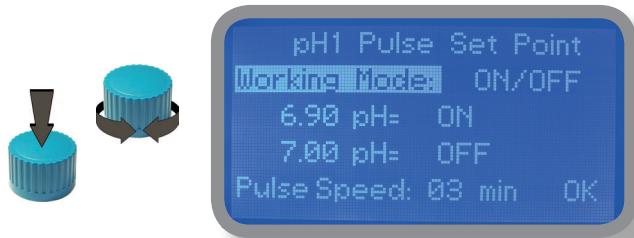
## 8. “Set-Point”, pH working modes

For “PH-1” and “PH-3” outputs, setpoint can be set between On/Off mode, Proportional (%) mode or disabled (OFF). For “PH-2” output, setpoint can be set using On/Off mode, Proportional PWM mode, Fixed PWM mode or disabled (OFF).



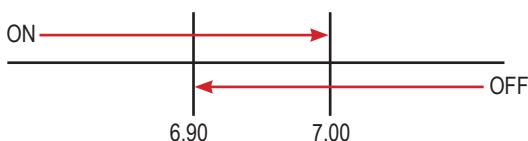
### 8.1 “Set-Point”, pH (on/off)

This mode is valid for all pH related outputs. On/Off mode set the instrument to operate using two set values that enable or disable the pH pump. To use this mode move cursor on “Working Mode”. Press the wheel and select it.



#### ON/OFF mode while dosing ALKALI

Set pH value at 7.00 OFF and 6.90 ON. Set Pulse Speed per minute (strokes per minute) based on dosing device capabilities. Instrument will leave the pH pump active until reading value will increase up to 7.00pH. At 7.00pH the pH pump will be disabled until reading value will decrease under 6.90pH.

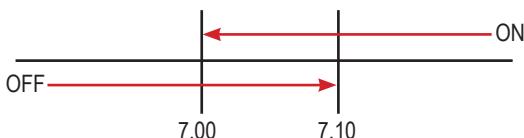


Pulse speed: to let pump operate at pulses per minutes add one or more minutes (1pulse every xx minutes).

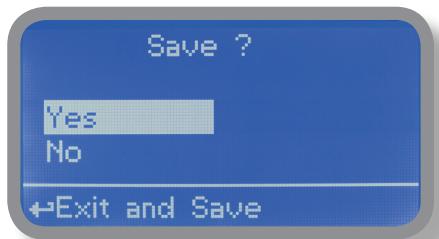
## 8.2 “Set-Point”, pH (on/off)

This mode is valid for all pH related outputs. ON/OFF mode while dosing ACID

Set pH value at 7.00 OFF and 7.10 ON. Set Pulse Speed per minute (strokes per minute) based on dosing device capabilities. Instrument will leave the pH pump active until reading value will decrease up to 7.00pH. At 7.00pH the pH pump will be disabled until reading value will increase up to 7.10pH.



To end procedure move cursor on “OK” and press wheel to proceed to “Save” request screen. Move wheel on “YES” to save or “NO” to discard changes.



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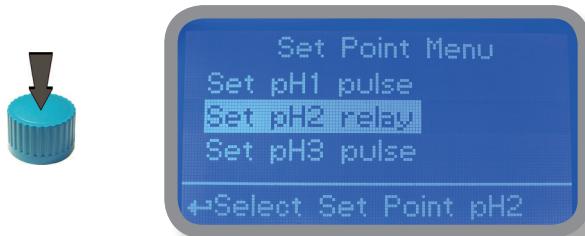
### Did you know ?

In chemistry, an alkali is a basic, ionic salt of an alkali metal or alkaline earth metal element. Alkalies are best known for being bases (compounds with pH greater than 7) that dissolve in water. The adjective alkaline is commonly used in English as a synonym for base, especially for soluble bases. This broad use of the term is likely to have come about because alkalies were the first bases known to obey the Arrhenius definition of a base and are still among the more common bases. Since Brønsted-Lowry acid-base theory, the term alkali in chemistry is normally restricted to those salts containing alkali and alkaline earth metal elements.

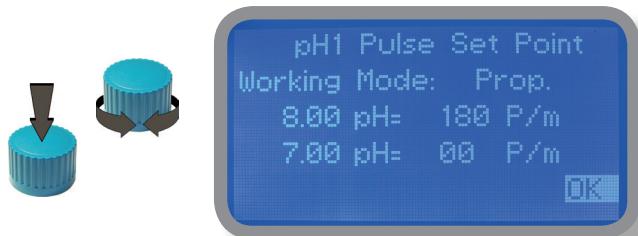
An acid (often represented by the generic formula HA [H+A-]) is traditionally considered any chemical compound that, when dissolved in water, gives a solution with a hydrogen ion activity greater than in pure water, i.e. a pH less than 7.0. That approximates the modern definition of Johannes Nicolaus Brønsted and Martin Lowry, who independently defined an acid as a compound which donates a hydrogen ion (H+) to another compound (called a base). Common examples include acetic acid (in vinegar) and sulfuric acid (used in car batteries). Acid/base systems are different from redox reactions in that there is no change in oxidation state.

## 8.3 “Set-Point”, pH (proportional)

This mode is valid for “PH-1” and “PH-3” outputs.

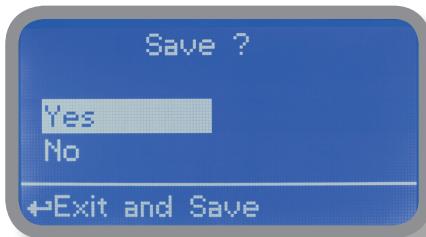


Proportional mode set the instrument to operate using a calculated percentage between two set values that enable or disable the pH pump. To use this mode move cursor on “Working Mode”. Press the wheel and select it.



### PROPORTIONAL mode between 7pH(0 P/m) and 8pH (180 P/m). p/m is : pulses per minute

In this mode the pH pump will be “ON” for values greater than 8pH with maximum set pulses per minute capacity (e.g.: 180) and it’ll be “OFF” for values lower than 7pH. For values of 7.5pH pump will be “ON” with 90 pulses per minute capacity. The calculation is based on 180 pulses per minute setting (see page 22). To end procedure move cursor on “OK” and press wheel to proceed to “Save” request screen. Move wheel on “YES” to save or “NO” to discard changes.



## 8.4 “PWM” (proportional), pH

This mode is valid for “PH-2” output only. Pulse-width modulation (PWM) of a signal or power source involves the modulation of its duty cycle, to either convey information over a communications channel or control the amount of power sent to a load.

This mode works over a settable (0 to 100 seconds) time to switch on or off selected output. During this time if reading value will move towards a set value (on or off) the PWM will operate the output on timered basis. Reaching the set value the PWM will permanently leave on or off the output.

Parameters to set for this mode are:

**Unit Value + %:** (time activity towards set value. 0% means 0 seconds. 100% means 100 seconds.)  
**pH range:** two pH values within PWM operates.

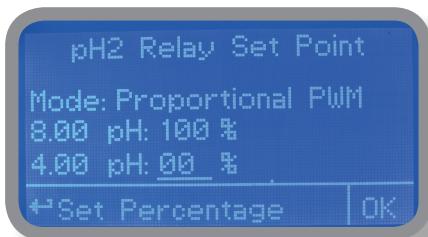
For example: set first pH value at 8.00 = 100% and second pH value at 4.0 = 0%.

For reading values  $\geq$  to 8.00 the output will be permanently ON.

For reading values  $\leq$  4.0 the output will be permanently OFF.

For reading value of 7.00 the output will be OFF for 25 seconds, ON for 75 seconds.

For reading value of 6.00 the output will be OFF for 50 seconds, ON for 50 seconds.



## 8.5 “PWM” (fixed), pH

This mode is valid for “PH-2” output only. Pulse-width modulation (PWM) of a signal or power source involves the modulation of its duty cycle, to either convey information over a communications channel or control the amount of power sent to a load. Using fixed mode is possible to set operating time to switch on or off selected output.

During this time if reading value will move towards a set value (on or off) the PWM will operate the output on timered basis. Reaching the set value the PWM will permanently leave on (for selected amount of time) or off the output.

Parameters to set for this mode are:

**pH range:** two pH values within PWM operates.

**Ton:** ON period, during output activity.

**Toff:** OFF period, during output activity.

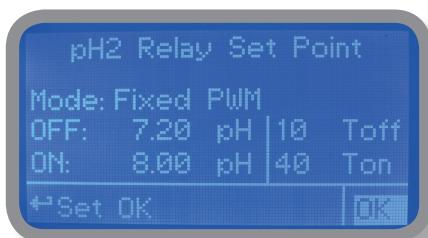
For example: set first pH value (OFF) at 7.20.. Set second pH value (ON) at 8.00.

Set “working-pause” output activity with Toff 0 seconds and Ton 40 seconds.

For reading values  $\geq$  8.00 the output will be ON with activity based on Ton and Toff.

For reading values  $\leq$  7.20 the output will be permanently OFF.

For reading values within working range operating mode is on HYSTERESIS base. Once reading value is 7.20 pH will be permanently off until it will reaches 8.00 pH.



## 8.6 “Set-Point”, CI working modes

For “CL-1” output, setpoint can be set using On/Off mode, Proportional (%) mode or disabled (OFF).

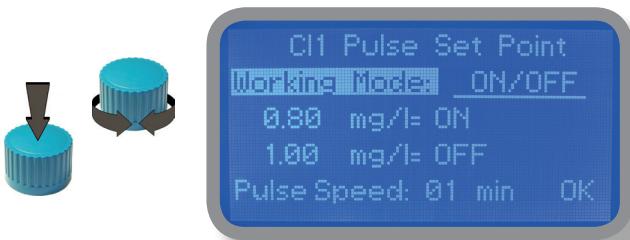
For “CL-2” output, setpoint can be set using On/Off mode, Proportional PWM mode, Fixed PWM mode or disabled (OFF).



## 8.7 “Set-Point”, CI (on/off)

This mode is valid for all CI related outputs.

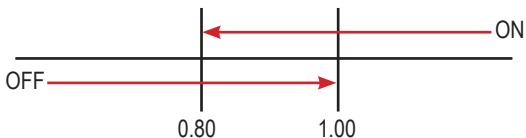
On/Off mode set the instrument to operate using two set values that enable or disable the Chlorine pump. To use this mode move cursor on “Working Mode”. Press the wheel and select it.



### ON/OFF mode

Set Cl value at 0.80 mg/l ON and 1.00 mg/l OFF. The difference between the two Cl values is called HYSTERESIS. Instrument will enable the Chlorine pump when reading value will decrease at 0.80mg/l. At 0.80mg/l the Chlorine pump will be enabled until reading value will increase at 1.00mg/l.

Pulse speed: to let pump operate at pulses per minutes add one or more minute (1pulse every xx minutes).

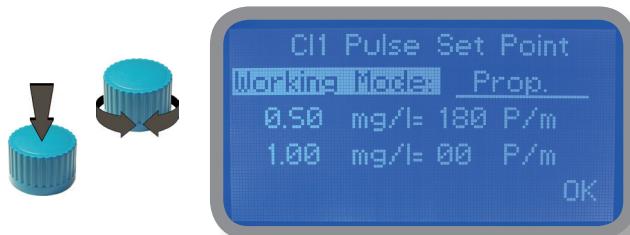


## 8.8 “Set-Point”, Cl (proportional)

This mode is valid for “CL-1” output only.



Proportional mode set the instrument to operate using a calculated percentage between two set values that enable or disable the Chlorine pump. To use this mode move cursor on “Working Mode”. Press the wheel and select it.



**PROPORTIONAL** mode between 1.00Cl (0 p/m) and 0.50Cl(180 p/m). p/m is : pulses per minute

In this mode the Cl pump will be “ON” for values lower than 0.50mg/l with set pulses/minute capacity (e.g.: 180) and it’ll be “OFF” for values greater than 1mg/l. For values of 0.75mg/l pump will be “ON” with 90 p/m capacity. The calculation is based on 180 pulse / minute. To end procedure move cursor on “OK” and press wheel to proceed to “Save” request screen. Move wheel on “YES” to save or “NO” to discard changes.

To end procedure move cursor on “OK” and press wheel to proceed to “Save” request screen. Move wheel on “YES” to save or “NO” to discard changes.



## 8.9 “PWM” (proportional), CI

This mode is valid for “CL-2” output only. Pulse-width modulation (PWM) of a signal or power source involves the modulation of its duty cycle, to either convey information over a communications channel or control the amount of power sent to a load.

This mode works over a settable (0 to 100 seconds) time to switch on or off selected output. During this time if reading value will move towards a set value (on or off) the PWM will operate the output on timered basis. Reaching the set value the PWM will permanently leave on or off the output.

Parameters to set for this mode are:

**Unit Value + %:** (time activity towards set value. 0% means 0 seconds. 100% means 100 seconds.)

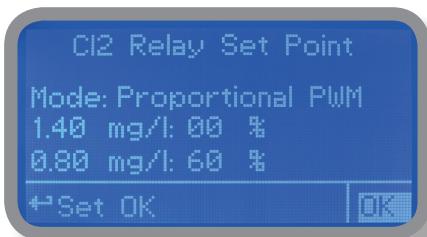
**CI range:** two CI values within PWM operates.

For example: set first CI value at 1.40 = 00% and second CI value at 0.80 = 60%.

For reading values  $\geq$  to 1.40 the output will be permanently OFF.

For reading values  $\leq$  0.80 the output will be ON for 60 seconds and OFF for 40 seconds.

If reading value is 1.1 mg/l then the output will be active at 30% (ON for 30 seconds, OFF for 70 seconds).



## 8.10 “PWM” (fixed), CI

This mode is valid for “CL-2” output only. Pulse-width modulation (PWM) of a signal or power source involves the modulation of its duty cycle, to either convey information over a communications channel or control the amount of power sent to a load. Using fixed mode is possible to set operating time to switch on or off selected output.

During this time if reading value will move towards a set value (on or off) the PWM will operate the output on timered basis. Reaching the set value the PWM will permanently leave on (for selected amount of time) or off the output.

Parameters to set for this mode are:

**CI range:** two CI values within PWM operates.

**Ton:** ON period, during output activity.

**Toff:** OFF period, during output activity.

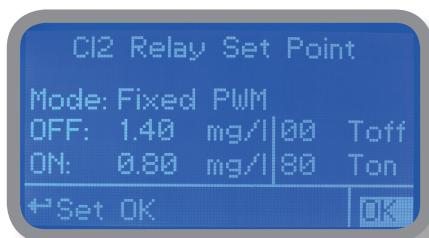
For example: set first CI value (OFF) at 1.40. Set second CI value (ON) at 0.80.

Set “working-pause” output activity with Toff 0 seconds and Ton 80 seconds.

For reading values  $\geq$  1.40 the output will be permanently OFF.

For reading values  $\leq$  0.80 the output will be ON with activity based on Ton and Toff.

For reading values within working range operating mode is on HYSTERESIS base. Once reading value is 1.40 mg/l will be permanently off until it will reaches 0.80 mg/l.



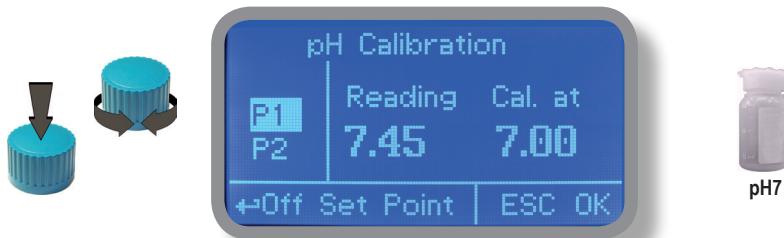
## 9. "Probe Calibration", pH

pH calibration procedure involves two calibration points and it requires two buffer solutions. Default buffer solutions are pH 4.00 and pH 7.00. pH reading value can be also compensated from "pH compensation" menu. From "Menu Calibration" choose "pH probe".



In the following example instrument will calibrate pH using default buffer solutions values.

**Note:** this procedure assumes that instrument is correctly configured and a working pH probe connected. Otherwise unattended results may occur.

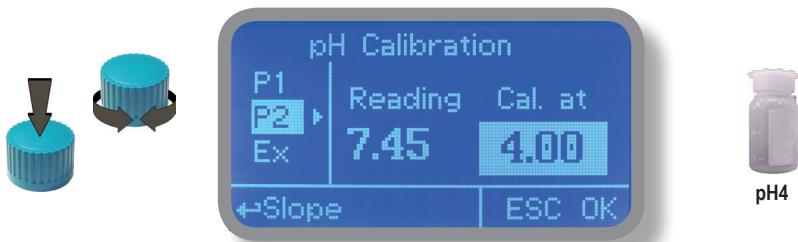


### Calib 1st Point.

Once into "pH Calibration" menu move wheel on "P1" then press wheel to enter into first point calibration submenu. Prepare 7.00pH buffer solution and dip probe's sensor on it. Wait until reading value is stable and according to buffer solution value move wheel until it is the same on display ("Cal. at" field). Default value is 7.00pH. To end procedure move cursor on "OK" and press wheel to proceed to next step.

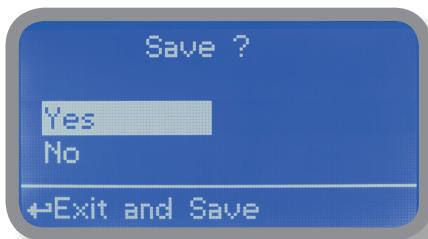
**Note:** buffer solution value may change if environment temperature it's different than 20°C. Read solution's label for more information. According to this occurrence "pH Default" must be changed.

## 9. "Probe Calibration", pH



### Calib 2nd Point.

Move wheel on "P2" then press wheel to enter into second point calibration submenu. Prepare 4.00pH buffer solution and dip probe's sensor on it. Wait until reading value is stable and according to buffer solution value move wheel until it is the same on display ("Cal. at" field). Default value is 4.00pH.

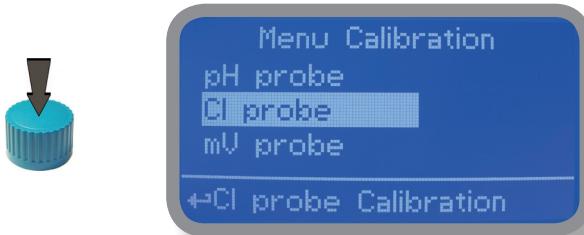


To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

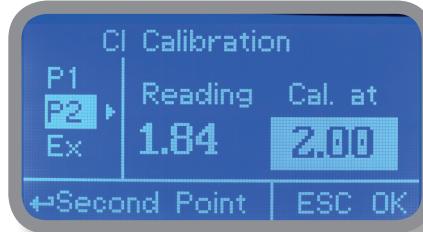
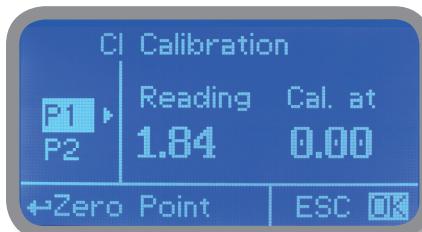
**Note:** buffer solution value may change if environment temperature it's different than 20°C. Read solution's label for more information. According to this occurrence "pH Default" must be changed.

## 9.1 “Probe Calibration”, Cl

Cl calibration procedure involves probe's selection, Zero (P1) and 2nd Point (P2) calibration. From “Menu Calibration” choose “Cl probe”.



Note: This procedure assumes that instrument is correctly configured and a working Chlorine probe connected and installed on system. Measurement must be performed using plant water. Otherwise unattended results may occur.



Calib Zero (P1).

Once into “Cl calibration” menu move on “P1” then press wheel to enter into calibration mode. For a correct system calibration proceed as follows.

- install an “activated carbon filter” prior to probe’s holder.
- let system water flow into probe holder for about 30 minutes.
- press wheel (cursor must be on “Cal.at”). Remove filter.



Carbon Filter System

Calib 2nd point (P2).

Now move on “P2” then press wheel to enter into calibration mode. For a correct system calibration use a Photometer or a DPD device to read chlorine on system. Enter value using the wheel then move cursor on “OK”. Now press the wheel.

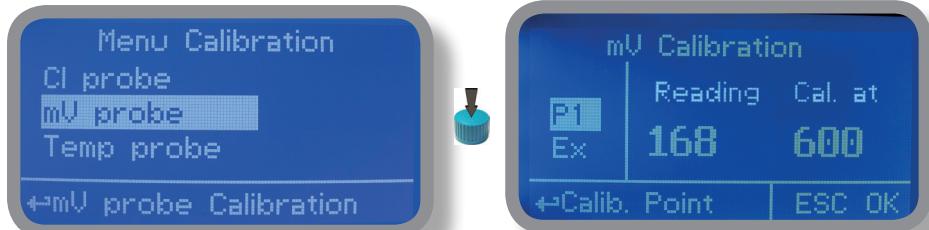


Photometer

To end procedure move cursor on “OK” and press wheel to proceed to “Save” request screen. Move wheel on “YES” to save or “NO” to discard changes. If an error occurred during calibration procedure then the instrument will show an error message and will ask to proceed to a new calibration, cancel current operation or restore default settings.

## 9.2 “Probe Calibration”, ORP

ORP calibration procedure involves probe's selection with one point (P1) calibration. From “Menu Calibration” choose “mV probe”.

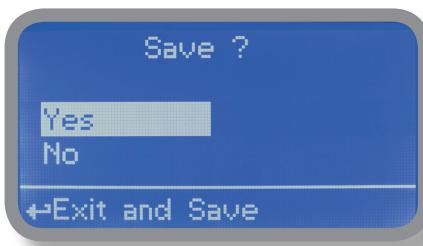
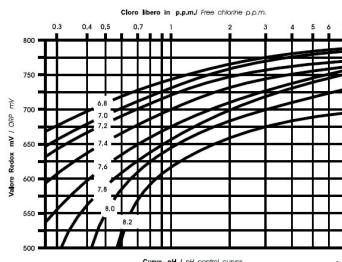


**Note:** This procedure assumes that instrument is correctly configured and a working ORP probe connected and installed on system. Measurement must be performed using plant water. Otherwise unattended results may occur.

Calibration can be performed in two ways: the first by alignment with a buffer solution, the second by reading the residual chlorine level of the pool with the DPD1, comparison with the attached graph followed by alignment of the pumps group. The choice of method is exclusively at the user's discretion. In both cases, to establish the set-point value, a check using the DPD1 or other analysis system is necessary. The enclosed graphs provide a reference between the mV value read by the pumps group and the quantity of residual chlorine expressed in mg/litre, and are linked to the pH value.

- 1) Measure buffer solution temperature and verify that it is the same printed on solution's label.
- 2) Remove protective cap from probe and wash probe's tip into water. Then dry it by shaking the probe in air.
- 3) On instrument set “Cal. at” value to match buffer solution value then put probe's tip into buffer solution and wait until instrument shows a stable reading value (mV field).
- 4) Move cursor on “OK” and press wheel to confirm the new calibration value. If calibration process fails the instrument will show “CALIBRATION FAILED”. Repeat procedure otherwise move on “ESC” and press wheel.

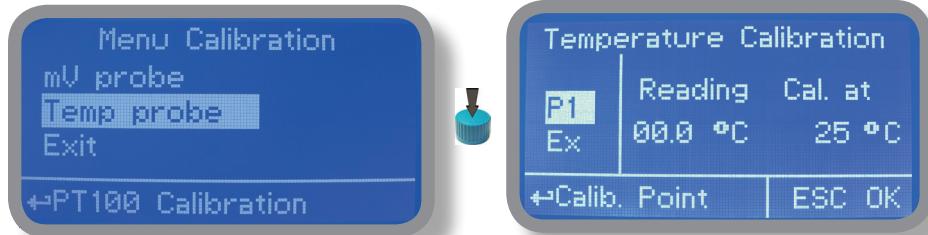
REDOX - mg FREE CHLORINE - pH GRAPHIC TABLE



To end procedure move cursor on “OK” and press wheel to proceed to “Save” request screen. Move wheel on “YES” to save or “NO” to discard changes. If an error occurred during calibration procedure then the instrument will show an error message and will ask to proceed to a new calibration, cancel current operation or restore default settings.

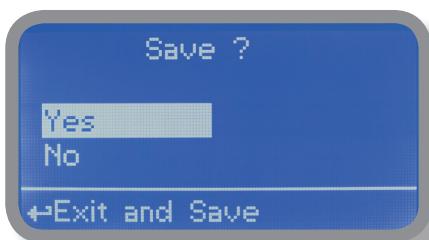
### 9.3 "Probe Calibration", °C - Temperature

A professional thermometer is required to obtain a reliable calibration. From "Menu Calibration" choose "Temp probe".



**Note:** This procedure assumes that instrument is correctly installed and configured, connected to a working PT100. Calibrate using plant's temperature otherwise unattended results may occur.

Using an external thermometer read actual temperature and edit related field "Cal. at". Confirm by pressing wheel.



To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes. If an error occurred during calibration procedure then the instrument will show an error message and will ask to proceed to a new calibration, cancel current operation or restore default settings.

## 10. "Parameters"

From "Menu Calibration" choose "Parameters". This menu allows to set a delay (max 60 minutes) before pumps begin to feed. Furthermore use this menu to set pH pump startup priority and to change default passcode.



### Feeding Delay.

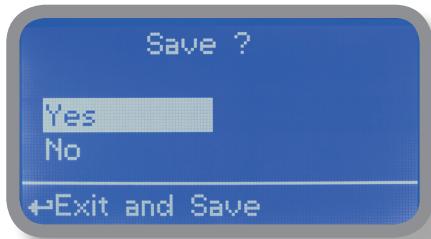
Move on "Feeding Delay" then press wheel. Choose a value between 0 (disabled) and 60 minutes (maximum delay time). This feature can be used to accord a startup delay for the pumps. Delay occurs when instrument is powered or after a "NO FLOW" contact recovery.

### Mode.

Move on "Mode" then press wheel. If both pumps need to operate, a startup priority can be set to allow the pH pump to begin to feed prior to Cl pump. Choose "pH priority" to enable this function. Cl pump will begin to dose when pH pump has stopped.

### New Pcode.

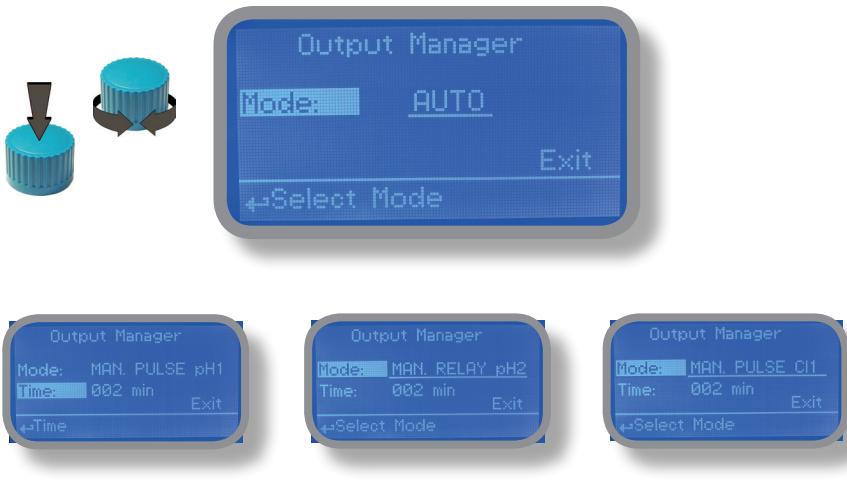
See page 10.



To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

## 11. "Output Manager"

From "Menu Calibration" choose "Output Manager". This menu allows to manually operate all outputs for a settable time. Set to "AUTO" for normal operating mode. Set to "OFF" to permanently disable outputs.



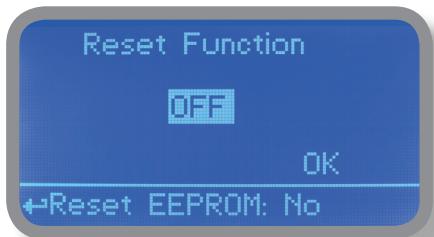
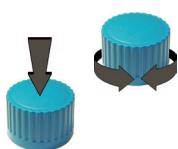
Press wheel to move cursor on "TIME" field. Once here, choose a working time between 0 (disabled) or 199 minutes. Move on "EXIT", then press wheel.



Choose "YES" to save changes. Exit from main menu. Main display will show a countdown for selected output. To stop this countdown go back to "Output Manager" menu and choose "AUTO" as working mode or wait until countdown ends. **This function can be used for priming purposes.**

## 12. "Instrument Reset"

To restore instrument to its default values (including password) once into "Instrument Reset" menu, press wheel then change value to "ON", press wheel again, move on "OK" then finally press wheel. The instrument display will show "CHECKSUM ERROR". Press whell to return into "Main Menu". Move on "EXIT", then press wheel. The instrument is now restored to factory default. Please repeat all calibration procedures and programming parameters.

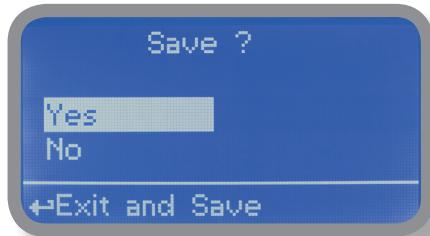


## 13. "Dosing Alarm"

Use this menu to assign a maximum time to the pumps for reaching the setpoint. If set time ends and the pumps are still dosing, within this menu is possible to STOP them or just to show an alarm message. Function can be disabled selecting "OFF" instead of a number (minutes). Dosing alarm can be set for both or just one pump.



E.g. To set Cl pump to stop after time ends and setpoint isn't still reached press wheel, choose maximum time, press wheel move on next field and choose "STOP". Time can be set between 0 and 100 minutes. When satisfied with settings move on exit and press wheel.



To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

## 14. "International"

Use this menu to set international parameters as UNIT FORMAT (Europe IS or USA), Local Time and Date.



**Format.**

Use this option to use European or USA units format. See table for differences.

EUROPE IS (International Standard)	USA
Date (DD/MMM/YY)	Date (MMM/DD/YY)
Time 24h	Time AM / PM
°C	°F

**Time.**

Use this option to set local time.

**Date.**

Use this option to set date.

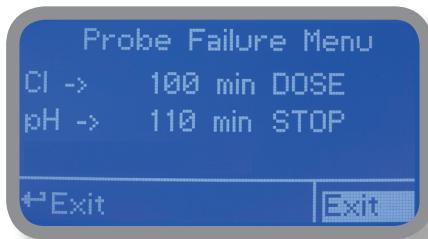
Move on exit to end changes.



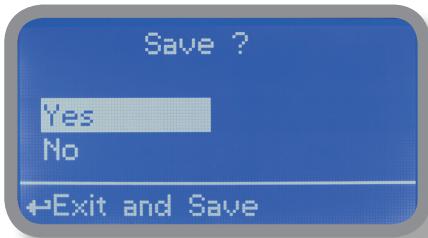
To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

## 15. "Probe Failure"

Use this menu to assign a maximum time to connected probes to stay stuck. A stuck probe (it remains on same value for some time) means that probably probe itself is damaged. Within this menu is possible to STOP pumps or just to show an alarm message (probe failure). Function can be disabled selecting "OFF" instead of a number (minutes). This function can be set for all or just one probe.



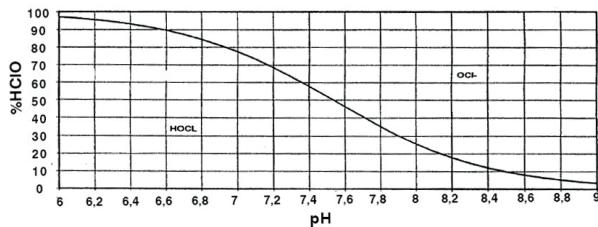
E.g. To set Cl pump to stop after time ends and probe doesn't change reading values press wheel, choose maximum time, press wheel move on next field and choose "STOP". Time can be disabled (off) or set between 100 and 254 minutes. When satisfied with settings move on exit and press wheel.



To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

## 16. "pH Compensation"

To enable pH compensation for Cl measurement press wheel then choose "ON". To disable compensation choose "OFF".



To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

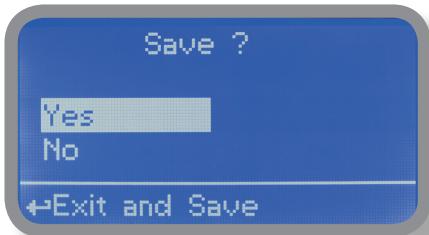
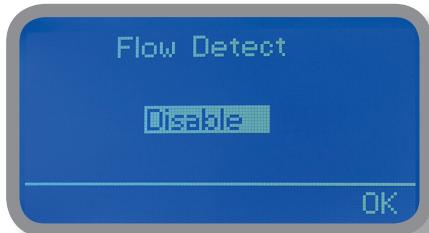
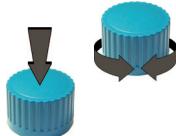
## 17. "Disinfectant"

To change disinfectant product type (chlorine based or bromine based) press wheel then move wheel to change "BROMINE" or "CHLORINE" then press wheel again. To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes. **Note: this changes affect main screen UNIT display [Br2 or Cl2].**



## 18. "Flow Contact"

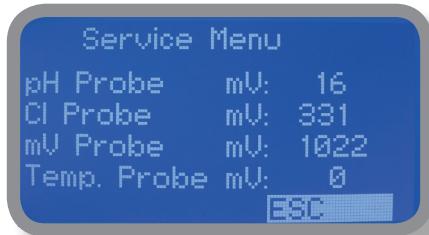
Flow contact (locate connection on page 4) can be enabled to stop all dosing activities using a "REVERSE" (N.O. normally opened contact) or "DIRECT" (N.C. normally closed contact). Move wheel for enabling and changing contact logic.



To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

## 19. "Service"

This "view only" menu shows probes reading live. Press "ESC" to exit.



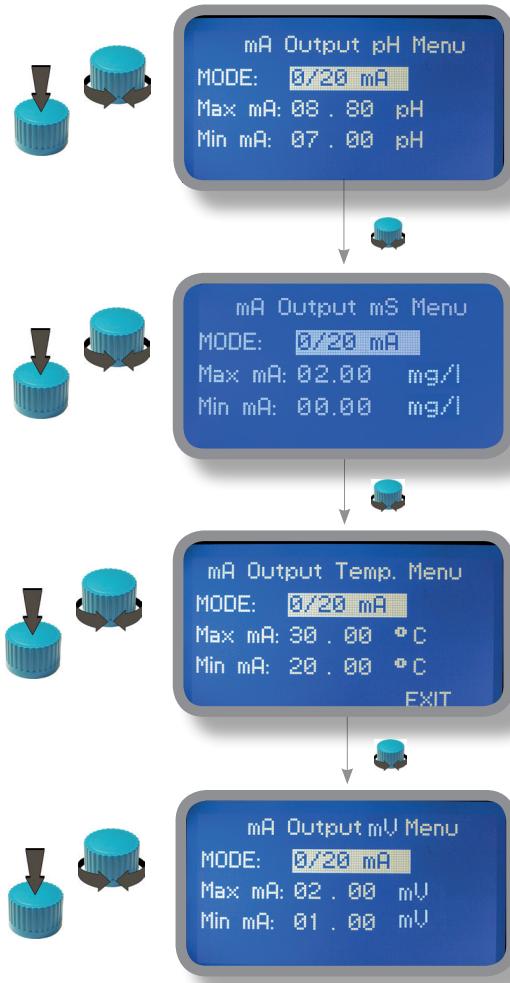
## 20. "mA Outputs"

This menu allows to configure mA current outputs for pH, Chlorine and Temperature channels. Options to set are:

**MODE** (selectable between 0-20 or 4-20 mA current output)

**Max mA**: maximum probe's reading value at 20 mA current

**Min mA**: minimum probe's reading value at 0 or 4 mA current



Rotate wheel to move within all 3 channels. Click wheel to select parameter and rotate wheel to change it. Click wheel again and rotate wheel to move cursor on next parameter. To end procedure move cursor on "EXIT" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

## 21. Technical information.

Power supply: 85÷264 VAC

pH range: 0 ÷14 ; Cl range: 0÷10 mg/l ; ORP range: 0÷1000 mV

Environment Temperature: -10°C ÷ 50°C (14°F ÷ 122°F) ; 0÷95% (non condensing) relative humidity

Chemical Temperature: 0 ÷ 50°C (32 ÷ 122°F)

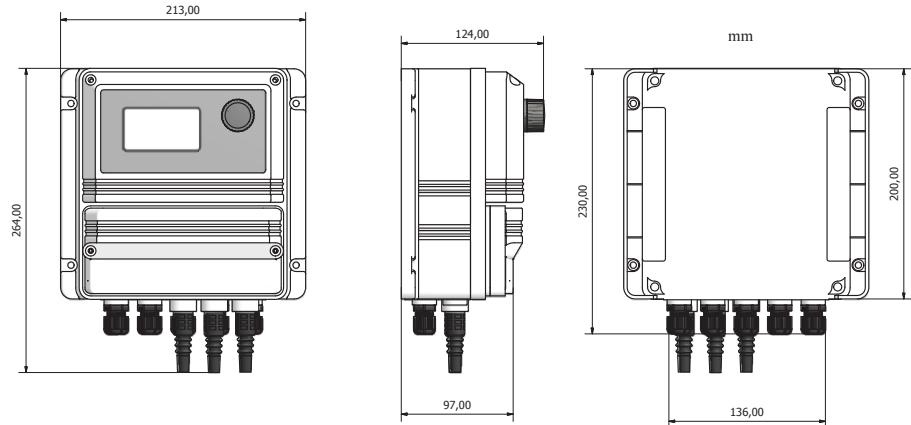
Installation Class: II

Pollution Level: 2

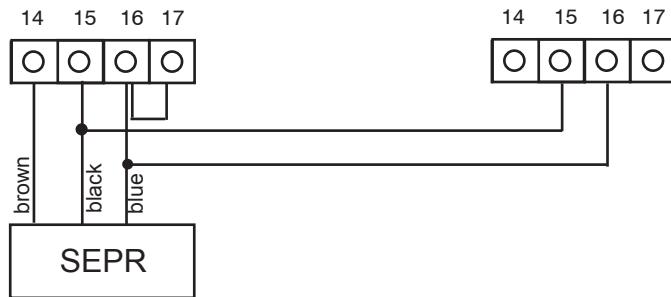
Packaging and Transporting Temperature: -10 ÷ 50°C (14 ÷ 122°F)

Protection degree: IP 65

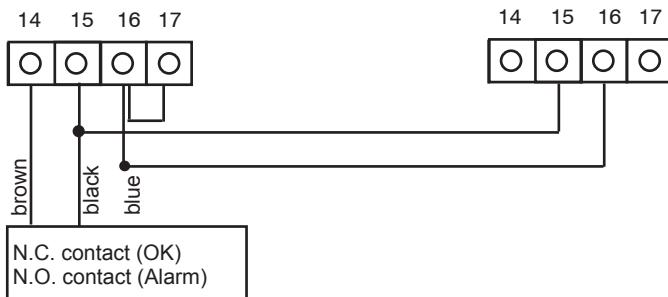
## 22. Dimensions and Flow.



SEPR "Flow Sensor" configuration for two instruments

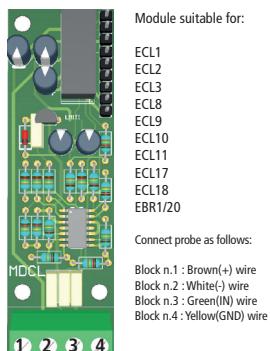


Configuration of a Flow Switch with a voltage free contact and two instruments

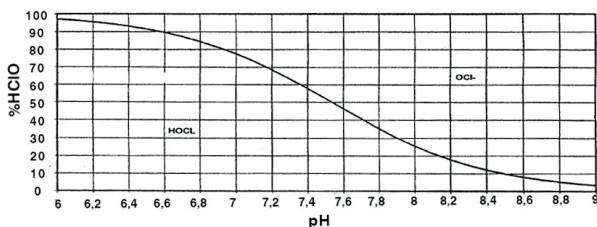


## Appendix A - MDCL1 probe series module

Located under mainboard cover there are two connectors that can be used to install probe modules. Modules come pre-installed upon request and may appear different as shown (different configurations). Identify installed modules to correctly connect probes. According to installed probe select required model.



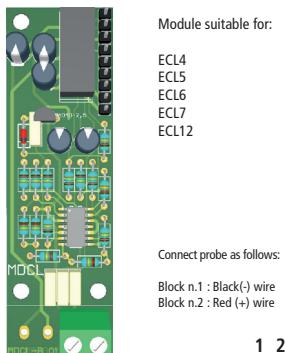
MDCL1 probe series probe module require to enable or disable pH compensation for Cl measurement. Within "Main menu", select "pH Compensation" then press wheel then choose "ON". To disable compensation choose "OFF". Changes into this menu requires to recalibrate chlorine probe.



To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

## Appendix B - MDCL6 probe series module

Located under mainboard cover there are two connectors that can be used to install probe modules. Modules come pre-installed upon request and may appear different as shown (different configurations). Identify installed modules to correctly connect probes. According to installed probe select required model.



MDCL6 probe series module require to enable or disable pH compensation for Cl measurement. Within "Main menu", select "pH Compensation" then press wheel then choose "ON". To disable compensation choose "OFF". See previous page for screenshot and dissociation graph.

Furthermore MDCL6 probe series module may be configured to operate as bromine or chlorine disinfectant. Within "Main menu" select "Disinfectant". To change disinfectant product type (chlorine based or bromine based) press wheel then move wheel to change "BROMINE" or "CHLORINE" then press wheel again. To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

Note: this changes will affect main screen UNIT display [Br2 or Cl2].



To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

## Appendix C - MDSCL module for SCLxx probes

Located under mainboard cover there are two connectors that can be used to install probe modules. Modules come pre-installed upon request and may appear different as shown (different configurations). Identify installed modules to correctly connect probes. From Calibration Menu choose "Select Probe" and according to installed probe select required model.



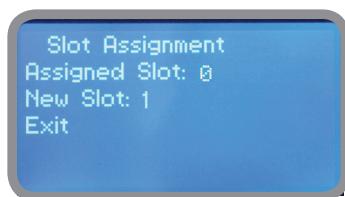
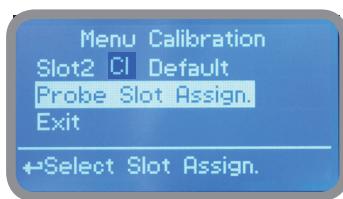
Connect chlorine probe (mod. SCLxx) to this module as follows:

- 1 (-485) green wire
- 2 (+485) white wire
- 3 (GND) black wire
- 4 (+5VDC) red wire

## Appendix - SETUP and SLOT SENSORS ASSIGNMENT

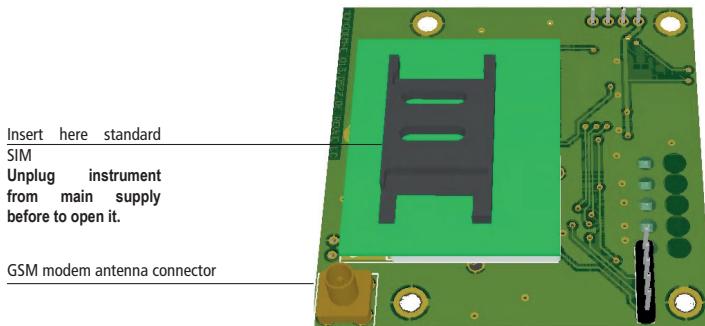
To assign a probe to a slot between the two available connecting the probe module to the required slot and repeating procedure for each module. Within calibration menu select "PROBES SLOT ASSIGN." and assign the probe to the required SLOT setting it into "NEW SLOT" field. Repeat procedure for the other probe always installing one at a time. At the end of procedure you can enter both modules with probes in the assigned slot.

To complete procedure please power cycle the controller. **Note: chlorine probe will be detected if assigned to slot 0.**



## Appendix Communication HARDWARE - "SMS/GSM" Module

Located under mainboard cover there is a four pins connector that can be used to install USB, ETHERNET or MODEM modules. Modules come pre-installed upon request and may appear different as shown (different configurations). "SMS/GMS module" can be configured to send SMS messages containing critical instrument information.



To obtain reliable results with this feature please check the following list:

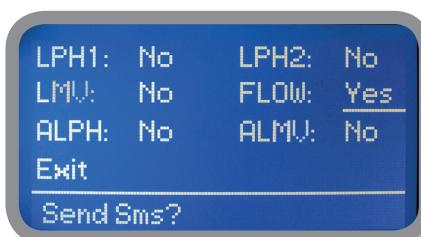
- Make certain the antenna location is not shielded by metal objects or near sources of electrical 'noise'.
- Do not route the cable where it could be pinched in doors, windows etc.
- Secure the antenna cable
- Ensure that SIM into "SMS/GSM modeule" is properly inserted, activated and within operator range.
- Set instrument ID / NAME from "RS485 Setup" menu and configure "Out of Range Alarm" menu.

Within "Main menu" select "SMS MENU" to enable SMS service and enter SMS receiver phone numbers.



Up to three numbers for sending SMS can be stored into LDPRHR memory. SMS recipient will receive an SMS containing instrument ID, NAME and status. Number formats can be stored using international prefix "+", international prefix "00" or local.

WARNING: THIS FUNCTION COULD NOT BE FREE OF CHARGE. DEPENDING ON YOUR OPERATOR CONTRACT IT COULD GENERATE PAYING SMS TRAFFIC !



To enable warning message for related alarm condition choose "YES", to disable choose "NO". Then move wheel on Exit and SAVE configuration. **SMS will be sent when one or more ("YES") fields will change.**

LPH1 or 2 : level alarm for PH1 or PH2 levels

LMV: level alarm for ORP

FLOW: flow alarm

ALPH: out of reading range for pH probe

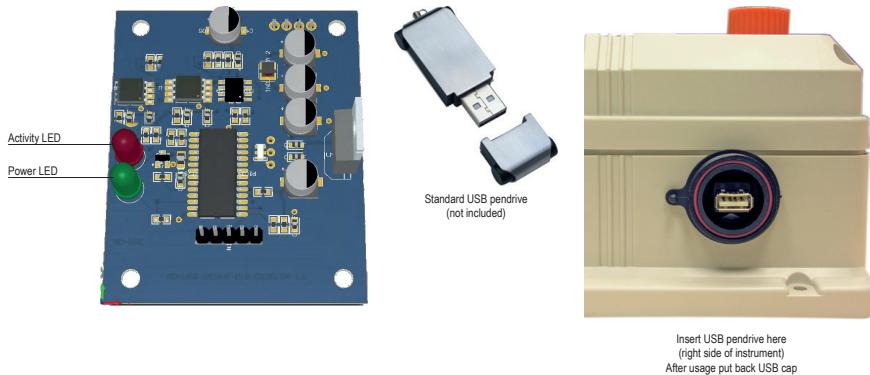
ALMV: out of reading range for ORP probe

WARNING: TO AVOID UNSOLICITED MESSAGES  
USE CAREFULLY THIS SETUP!

## Appendix Communication HARDWARE - "LOG USB" Module

Located under mainboard cover there is a four pins connector that can be used to install "USB data log module" or "SMS module". Modules come pre-installed upon request and may appear different as shown (different configurations).

"USB data log module" records instrument activities. These information can be permanently stored into a standard USB pendrive. Pendrive can be connected to a PC using "LDPHxx DATA LOGGER" software to review and print instrument's activities. To obtain reliable results with this feature please set instrument ID and NAME from "RS485 Setup" menu and activate log recording from "LOG SETUP" menu.



### HOW TO RECORD INSTRUMENT'S ACTIVITIES INTO USB PENDRIVE ?

Insert USB pendrive into USB connector (located on the right side of instrument). Instrument will save data log on USB pendrive. After succeeded in saving data it will ask if delete instrument's log or not (anyway USB pendrive will not be formatted). Move wheel on "YES" to delete log info from instrument and return to main screen or "NO" to leave log info on instrument and return to main screen. **Wait about 30 seconds to safety remove the USB pendrive.**



### HOW TO REVIEW INSTRUMENT'S ACTIVITIES RECORDED INTO USB PENDRIVE ?

It's necessary to install the "ERMES COMMUNICATION SOFTWARE" to review USB pendrive info on a PC. Follow installation instructions during software setup to correctly complete this procedure. Once the software has been installed and launched insert your USB pendrive into any available USB connector of PC. Instrument's log will be automatically uploaded into PC memory. See "ERMES COMMUNICATION SOFTWARE" 5 quick guide for more info.

## Appendix Communication - Software

### “RS485” menu.

Prior to install the instrument into an RS485 local system a unique ID NUMBER (from 1 to 30) and ID NAME (station name) must be set. Rotate wheel and edit fields. If ID number has already assigned an error message will follow after ID Check (move cursor on CHECK and press wheel). In this event try using another number.



### “SMS” menu.

Instrument may remotely send SMS alarm messages using its own modem (sold as option). It can be configured as follows:

#### SMS1 / SMS2 /SMS3.

Using the wheel enter a mobile phone that will receive alert SMS messages if something wrong occurs. SMS number must be set using local number format. For example : 3391349134 will send an SMS message to mobile phone. Log level (and SMS frequency alert) may be set using options in “ACTIVE MSG” within “GSM menu”.



- TO AVOID UNDESIRED MESSAGES USE CAREFULLY LOG SETUP -

- WARNING: THIS FUNCTION COULD NOT BE FREE OF CHARGE. DEPENDING ON YOUR OPERATOR CONTRACT IT COULD GENERATE PAYING SMS TRAFFIC !

## Appendix Communication - Software

### “TCP/IP” menu.

The instrument may be remotely operated using a standard ethernet connection (sold as option). A static or dynamic IP address and a CAT5 ethernet cable is required. According to your network capacity connection speed is 10/100Mbps. To obtain a valid IP address and subnet mask contact your net administrator. Enter parameters and move cursor on “SAVE” to store parameters then move on “OK” and press wheel to save and activate configuration.

Based on your network configuration choose to obtain network parameters automatically (DYNAMIC) or manually (STATIC).



See “ERMES Communication Software” manual for proper PC software configuration.

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#### What is a static IP address/dynamic IP address?

A static IP address is a number (in the form of a dotted quad) that is assigned to a computer by an Internet service provider (ISP) to be its permanent address on the Internet. Computers use IP addresses to locate and talk to each other on the Internet, much the same way people use phone numbers to locate and talk to one another on the telephone. When you want to visit whatis.com, your computer asks a domain name system (DNS) server (think telephone information operator) for the correct dotted quad number (think phone number) for whatis.com and your computer uses the answer it receives to connect to the whatis.com server. It would be simple if every computer that connects to the Internet could have its own static IP number, but when the Internet was first conceived, the architects didn't foresee the need for an unlimited number of IP addresses. Consequently, there are not enough IP numbers to go around. To get around that problem, many Internet service providers limit the number of static IP addresses they allocate, and economize on the remaining number of IP addresses they possess by temporarily assigning an IP address to a requesting Dynamic Host Configuration Protocol (DHCP) computer from a pool of IP addresses. The temporary IP address is called a dynamic IP address.

Requesting DHCP computers receive a dynamic IP address (think temporary phone number) for the duration of that Internet session or for some other specified amount of time. Once the user disconnects from the Internet, their dynamic IP address goes back into the IP address pool so it can be assigned to another user. Even if the user reconnects immediately, odds are they will not be assigned the same IP address from the pool. To keep our telephone analogy going, using a dynamic IP address is similar to using a pay phone. Unless there is a reason to receive a call, the user does not care what number he or she is calling from.

There are times, however, when users who connect to the Internet using dynamic IP wish to allow other computers to locate them. Perhaps they want to use CU-SeeMe or use a VoIP application to make long distance phone calls using their IP connection. In that case, they would need a static IP address. The user has two choices; they can contact their ISP and request a static IP address, or they can use a dynamic DNS service. Either choice will probably involve an additional monthly fee.

Using a dynamic DNS service works as if there was an old-fashioned telephone message service at your computer's disposal. When a user registers with a DNS service and connects to the Internet with a dynamic IP address, the user's computer contacts the DNS service and lets them know what IP address it has been assigned from the pool; the service works with the DNS server to forward the correct address to the requesting DHCP computer. (Think of calling the message service and saying “Hi, I can be reached at 435.44.32.111 right now. Please tell anyone who tries to reach me to call that number.”) Using a dynamic DNS service to arrange for computers to find you even though you are using a dynamic IP address is the next-best thing to having a static IP.

## Appendix Communication - Software

### “GPRS” menu.

Instrument may be remotely operated using an embedded standard GPRS modem (sold as option). In order to activate this service please ensure that the following steps are correctly completed:

- Make certain the antenna location is not shielded by metal objects or near sources of electrical ‘noise’.
- Make certain the distance from the antenna to the “Instrument” unit is within cable length.
- Do not route the cable where it could be pinched in doors, windows etc.
- Ensure that SIM into “Instrument” modem is correctly inserted, activated and within operator range.



Instrument can be set for ERMES services enabled (Configuration option set to “ERMES YES”) or messages only (Configuration option set to “ERMES NO”) based on your SIM data access parameters. For manual configuration option enter APN (access point name) and SIM phone number. Move wheel on “OK” to save and move on “ESC” to go back to main menu.

**Don't forget to enter SIM CODE into PIN NUMBER menu to unlock SIM.**

**WARNING: THIS FUNCTION COULD NOT BE FREE OF CHARGE. DEPENDING ON YOUR OPERATOR CONTRACT IT COULD GENERATE PAYING DATA TRAFFIC !**

### “Email” menu.

If Ethernet module or GPRS module is installed (sold as option) the instrument can be configured to send email alarm messages up to two recipients. Click on “Email 1” or “Email 2” and enter email address.



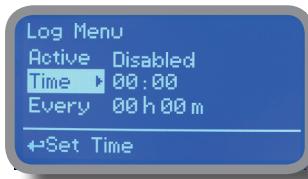
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Access point name (APN) identifies an IP packet data network (PDN), that a mobile data user wants to communicate with. In addition to identifying a PDN, an APN may also be used to define the type of service, (eg connection to wireless application protocol (WAP) server, multimedia messaging service (MMS)), that is provided by the PDN. APN is used in 3GPP data access networks, eg general packet radio service (GPRS), evolved packet core (EPC).

## Appendix Communication - Software

### “LOG” menu.

This function records instrument activity (date, hour, temperature, uS, totalizer I/O, alarms, outputs). It starts for selected frequency period (every) at requested time (time). SET DATE & TIME BEFORE TO ENABLE LOG. IF NOT POWERED FOR ABOUT 30 DAYS THE INSTRUMENT WILL LOOSE DATE/TIME



Set ACTIVE to “enabled” to activate log recording.

TIME: recording start time (time format 23h e 59min)

EVERY: recording frequency (time format 23h e 59min)

Note: advanced log control (graph, printing, comparison tables, event filtering, etc) is available through “ERMES Communication Software” for PC.

See “ERMES Communication Software” manual for proper PC software configuration.

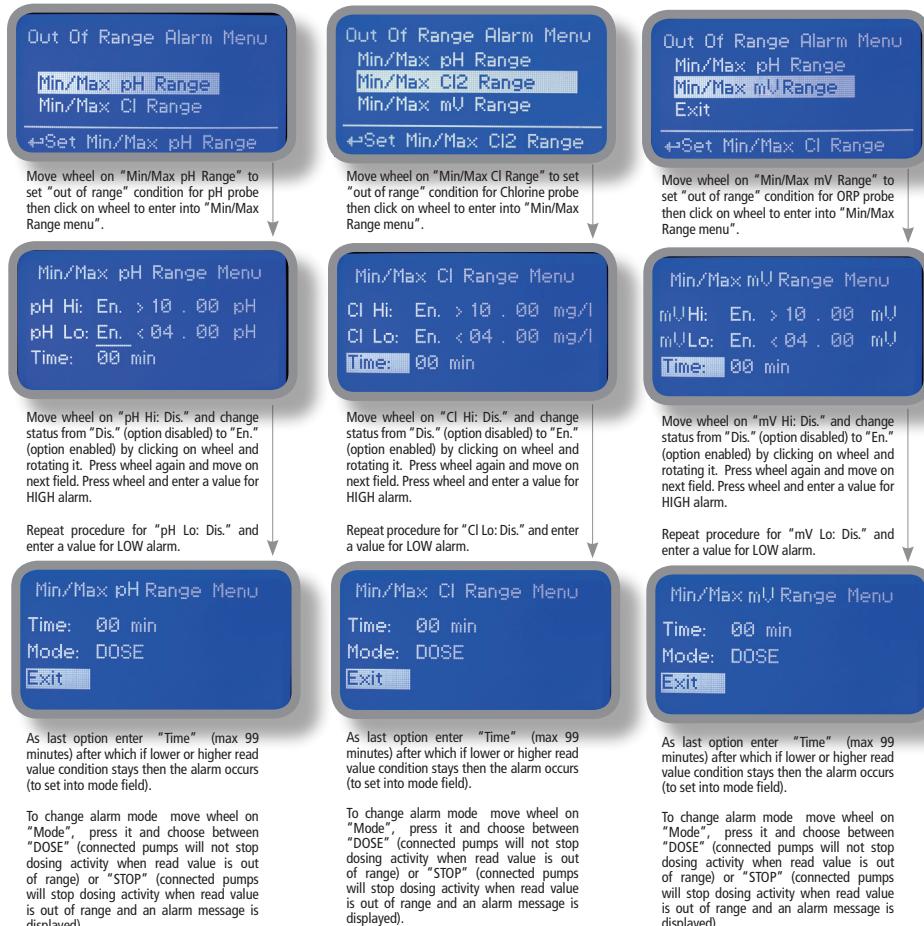
### “LOG VIEW” menu.

To see alarm log entries as set on log menu choose “log view” on main menu.



## 23. "Out of range alarm"

"Out of range alarm" menu defines the minimum and maximum pH and Chlorine probe read value before to stop dosing activity and to show an alarm message.



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Information on this manual may contain technical inaccuracies or typographical errors.  
The information contained may be changed at any time without prior notification or obligation.









When dismantling this instrument please separate material types and send them according to local recycling disposal requirements.

We appreciate your efforts in supporting your local Recycle Environmental Program.

Working together we'll form an active union to assure the world's invaluable resources are conserved.