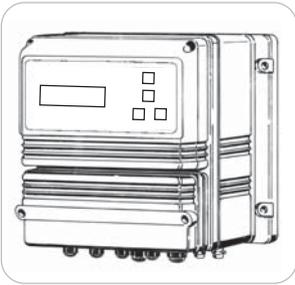




This manual contains important safety information about installation and use of this equipment. Ignoring this information could result in injuries or damages.



It is strictly forbidden to use this equipment with radioactive chemicals !



INSTRUCTION MANUAL FOR "LPHRHC" CALCULATED CHLORINE

Read carefully!



ENGLISH Version

R1-03-05



“LPHRHC” series instruments comply with the following European regulations:

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

Based on directive CEE 73/23 c 93/68 (DBT Low voltage directive) and directive 89/336/CEE (EMC Electromagnetic Compatibility)



GENERAL SAFETY GUIDELINES

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

When using instrument with aggressive chemicals observe the regulations concerning the transport and storage of aggressive fluids!

When installing outside European Community, always observe national regulations!

Manufacturer is not liable for any unauthorized use or misuse of this product that can cause injury or damage to persons 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.

Instrument and accessories must be serviced and repaired by qualified and authorised personnel only!

Always read chemical safety datasheet!

Always wear protective clothing when handling hazardous or unknown chemicals!

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INTRODUCTION

LPHRHC instrument is a pH and Redox meter with a built in Calculated Chlorine reader. It has two set-point: On/Off or proportional timered. pH, ORP and Calculated Chlorine are shown on a LCD backlight display. Instrument is housed in a plastic case with IP65 protection. Dimensions are: 225x215x125mm. A digital keyboard is used for data input and all measures are shown at the same time on the display.

WORKING RANGE FOR CALCULATED CHLORINE

Instrument works (within the following range: pH between 6.8 and 8.00 pH, reading res is 0.01 pH.

SPECIAL FUNCTIONS

Turning the instrument ON and OFF: Instrument isn't provided with a on/off switch. To disable it keep pressed for about three seconds "**UP**" key from main menu (fig.1). Display will show "OFF". To return to normal operating mode keep pressed again the "**UP**" key for about three seconds.

mV Display: To show mV value read by the probe keep pressed "**DOWN**" key for about three seconds from main menu (fig.1). Press it again to return into previous condition.

Summary Display: For a complete list of all instrument reading value and its working status keep pressed "**ESC**" key for about three seconds.

Use "**UP**" and "**DOWN**" key to scroll between info ("Setpoint", "Parameter", "Probe cal.", "Dosing Alarm", "I/O config.", "Out al"). To scroll "Out Al" and "I/O config." menu press "**ESC**". Keep pressed "**ENTER**" to return into previous condition.

STAND-BY TIME WHEN POWER UP (HOW TO CANCEL IT)

When the instrument is powered up there is a delay time before it becomes operative. This delay is useful to let the probes be polarized. To skip it keep pressed "**ENTER**" for 3 seconds during countdown.

INSTRUMENT RESET

To restore the instrument to its default values (factory values) follow this procedure:

- 1) unplug the instrument from main power
- 2) press both "**UP**" and "**DOWN**" keys and plug the instrument back to main power WHILE pressing these keys.
- 3) Wait until the instrument display "loading default settings" then release the keys and proceed to setup.

To manually activate SETPOINT 1 output (pH):
from fig.1 screen keep pressed “**DOWN**” and “**ESC**” keys.

To manually activate SETPOINT 2 output (Rh):
from fig.1 screen keep pressed “**DOWN**” and “**ENTER**” keys.

DISPLAY

When the instrument is powered (and after Stand-by delay) it shows the following picture:

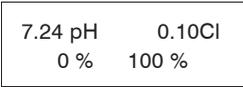


fig.1

Upper values are pH and Calculated Chlorine. Lower values (percentage or on/off) are dosing status for products. Keep pressed “**DOWN**” to show Redox (mV).

Calculated Chlorine error:

If, instead of a calculated chlorine value, the instrument shows a blinking “* * *”, please check pH reading value because its out of range.

If, instead of a calculated chlorine value, the instrument shows “+.+”, please check calculated chlorine reading value because it is exceeding the maximum instrument reading capacity (2.5ppm).

PASSWORD

The **SETUP** menu is protected by a four digit password. The instrument is provided without the password. To program or modify the password read the next paragraph.

HOW TO PROGRAM PASSWORD

Assure that the instrument is not in “OFF” mode. Keep pressed “**ENTER**” key for 3 seconds. The display will show:



fig.2

The default password is: 0000. Press “**ENTER**”. The display will show:



fig.3

Select "Parameter" using "UP" or "DOWN" keys and confirm pressing "ENTER" key. The display will show:

DELAY: 00 MODE 1 NEW PW: 0 0 0 0

fig.4

Press "ESC" two times. Insert a new password using "UP" or "DOWN" keys. Press "ESC" to pass to the next digit and "ENTER" to confirm the new password.

After this procedure, the instrument is in programming zone: press "ESC" to return to normal functioning.

HOW TO PROGRAM DELAY AND MODE

From the menu of fig.4 it is possible to set "Delay".

This function delays (0÷99 min.) the activation of dosing after pumps start-up or when stand-by contact will close.

Mode 1: standard working mode. In this functioning mode, the instrument will dose both at the same time acid and chlorine.

Mode 2: the instrument restores the pH value and then the chlorine value. At the end, press "ENTER" to confirm.

After this procedure, the instrument is in programming zone: press "ESC" to return to normal functioning.

CALIBRATION

To obtain a reliable measure, it is necessary to calibrate the probes, when installing and regularly.

pH SECTION

For pH probe alignment follow these instructions:

- 1) take two buffer solutions: a pH 4 and a pH 7;
- 2) measure the temperature and verify it corresponds with the value on the label;
- 3) insert the blue plug into the "pH" BNC connector of the instrument;
- 4) remove protective cap of probe;
- 5) wash probe's tip with water, dry it in air and dip the probe's tip into the pH 7.01 buffer solution;
- 6) shake and leave probe's tip into solution.

Enter into "Setup Menu" mode as in fig. 3. Select "Probe Calib.".

The display will show

> pH probe < Cl probe

fig.6

“pH probe” is the selected item. Press “**ENTER**” to confirm. The display will show:

Reading:	7.24 pH
Cal 1 at	7.00 pH

fig.7

Reading is the buffer solution value, wait until it is stabilized, then calibrate.

Through the READING value, you will obtain a stable reading for the calibration. The “R” value read during calibration can be different from the buffer solution value. It is only necessary wait a stable reading.

The value to calibrate is the one written in the lower part. Check the “Cal” value with the buffer solution value and use “**UP**” and “**DOWN**” key to change it. Press “**ENTER**” to confirm. The display will show:

Reading:	4.08 pH
Cal 2 at	4.02 pH

fig.8

Remove probe from buffer solution, wash the tip with water, dry it in air and dip it into a pH 4.02 buffer solution. Shake and leave probe’s tip into solution. Wait a stable reading.

Note: After 90 seconds without pressing any key the instrument come back to the normal function. To cancel calibration procedure press “ESC” key.

The “R” value read during calibration can be different from the buffer solution value. It is only necessary wait a stable reading.

The value to calibrate is the one written in the lower part. Check the “Cal” value with the buffer solution value and use “**UP**” and “**DOWN**” key to change it. Press “**ENTER**” to confirm.

If the calibration has been done correctly and the probe is in good condition, the display will show this message for few seconds:

CALIBRATION DONE

fig.5

If the probe does not give a reliable value, the display will show this error message:

CALIBRATION ERROR #2

fig.10

Refer to the table “Error messages” to find a solution.

CI (Calculated Chlorine) SECTION

The CI section calibration can be done through the residual chlorine reading in the swimming pool using the DPD1 and AFTER THE pH CALIBRATION.

ALIGNMENT WITH COLORIMETRIC ANALYSIS (DPD1)

After the instrument and probes installation, wait until the chlorine value is near the value required. Proceed to a free chlorine analysis using the DPD1 system.

From fig. 11:

Reading:	0.90Cl
Cal at	1.00 Cl

fig.11

The item "Reading" is the actually probe's reading value.

The item "Cal" is the DPD1 calibration value. Insert this value using "UP" and "DOWN" keys and press "ENTER" to confirm.

If the calibration has been done correctly and the probe is in good condition, the display will show this message for few seconds:

CALIBRATION DONE

fig.5

If the probe does not give a reliable value or if the value set is wrong, the display will show this error message:

CALIBRATION ERROR #2

fig.10

In this case, repeat the procedure.

Note: After 90 seconds without pressing any key the instrument come back to the normal function. To cancel the calibration procedure press "ESC" key.

HOW TO PROGRAM SET POINTS

pH section

Enter into Setup mode (see the chapter "How to program password") and when the display shows fig. 3 press "ENTER". The display will show:

> Set - Point pH <
Set- Point Cl

fig.14

The selected item is "Setpoint pH". Press "ENTER" to confirm. The display will show:

→ 7.3 pH =	00%
7.8 pH =	100%

fig.15

The cursor is the changeable value: use "UP" and "DOWN" keys to modify this value. Press "ESC" key to move on next field.

Through pH value, the pump can have two functioning modes: Proportional (%) and “ON - OFF”.

“ON-OFF” pH functioning mode

Set the two pH value on ON and OFF. Once the value read by the probe will be exactly 7.3 pH, the pump for acid will start working, at the maximum flow. When the pH value read will be exactly 7.8 pH the pump for acid will stop.

Proportional (%) pH functioning mode

Set the pH value on minimum and maximum % (for e.: 7.3 pH = 0% and 7.8 pH = 100%), the pump for acid will start working at 7.3 pH; if the pH increase, the pump will increase the flow proportionally till the 100% of the maximum flow at 7.8 pH.

If the pH increase more, the pump will continue to work at the set percentage.

Reducing the pH range, for e. 7.3 and 7.4, the proportionality field will be unchanged but it will come close to the ON-OFF functioning mode: setting the same pH value, the instrument will work in ON-OFF functioning mode.

Press “**ENTER**” to go back to fig.14. Press “**ESC**” two times to exit.



The instrument cannot work in a “mixed” functioning mode.
(Example: a parameter set on % and the other one on “ON-OFF”).

CI section

Enter into Setup mode (see chapter “How to program password”) and when the display shows fig. 3 press “**DOWN**” and then “**ENTER**”. The display will show:

→ 0.50 Cl = 100%
1.00 Cl = 0%

fig.16

The cursor is the changeable value: use “**UP**” and “**DOWN**” keys to modify this value.

Press “**ESC**” key to move on next field.

Through chlorine value, the instrument can have two functioning modes: Proportional (%) and “ON - OFF”.

Press “**ENTER**” to go back to fig.14. Press “**ESC**” two times to exit.

Example: set this value

→ 0.50 Cl = 50%
1.00 Cl = 0%

Functioning condition

read value ≤ 0.50 Cl
read value = 0.75 Cl
read value ≥ 1.00 Cl

Functioning time

50 seconds on - 50 seconds off
25 seconds on - 75 seconds off
instrument always off

Note: The output on the instrument is active in ON/OFF functioning mode too.

“ON-OFF” CI functioning mode

Set both the two CI values on “ON” and “OFF”. Once the value read by the probe will be exactly 0.50Cl, the pump for chlorine will start working, at the maximum flow. When the CI value read will be exactly 1.00Cl the pump for chlorine. will stop.

Proportional (%) CI functioning mode

Set the CI value on minimum and maximum % (for e.: 1.00Cl = 0% and 0.50Cl = 100%), the pump for chlorine will start working for value lower than 1.00Cl; if the chlorine will increase, the pump will decrease the flow proportionally, until it will reach the 0%.

MAX DOSING TIME ALARM

This safety feature activates an alarm (activation of a N.O. - N.C. contact) and/or stops the pumps dosing activity when, over a set time, the pumps have not restored correctly the pH and/or Chlorine value programmed in the setpoints.

The instrument’s tolerance for restoring the value programmed in the setpoints (aim of the dosing activity) is $\pm 10\%$.

In the main screen of the instrument (fig. 1) keep pressed “ENTER” for 3 seconds.

Insert the password and press “ENTER”.

Press “DOWN” key for 3 times until the instrument displays:

Setup Menu <Dosing Alarm>

fig.17

Press “ENTER”. The display will show:

pH:	>dis	stp
Cl:	dis	dos

fig.18

Press “UP” and “DOWN” key to change the field and press “ESC” to move on next field.

The alarm functioning for pH or for Chlorine can be:

- “DIS” (disabled) or
- a value between 1 and 200 minutes (time left to the pumps to restore the setpoints values).

The alarm has two functioning mode: “STP” and “DOS”.

“STP”: if the setpoint value will not be reached, the instrument will stop the dosing activity, it will show the alarm condition and it will enable the alarm output.

“DOS”: if the setpoint value will not be reached, the instrument will continue the dosing activity, it will show the alarm condition and it will enable the alarm output.

Note: Press any key to cancel the current alarm.

I/O CONFIG. -Output configuration-

This menu configures “STAND-BY” (stand-by for external signal) and “FLOW” (flow sensor such as “SEPR”). It is possible enable or disable outputs independently or set working mode (N.O. or N.C.). From the main screen (fig.1), keep pressed “**ENTER**” for 3 seconds. Insert the password and press “**ENTER**”. Press “**DOWN**” key 4 times until the instrument displays:

Setup Menu
<I/O Config.>

fig. 19

Press “**ENTER**”. The display will show:

I/O Config.
STD-BY: N.C.

fig. 20

To modify the “Stand-by” input status press “**UP**” or “**DOWN**” keys. Options available:
Dis. (disabled, use this option if the related input is not used).
N.O. (active when contact is closed).
N.C. (active when contact is open).

To modify the “FLOW” input status press “**ESC**” from the display of fig.20

I/O Config.
FLOW: N.C.

fig. 20a

To modify the “fLOW” input status press “**UP**” or “**DOWN**” keys. Options available:
Dis. (disabled, use this option if the related input is not used).
N.O. (active when contact is closed).
N.C. (active when contact is open).

Using a SEPR flow sensor, configure “Flow” status on N.C. Press “**ENTER**” to save and exit.

OUTPUT ALARM

This menu enable the alarm output for “FLOW” (Flow) and the maximum dosing time alarm for pH and for Chlorine independently. From the main screen (fig. 1), press “**ENTER**” for 3 seconds. Insert the password and press “**ENTER**”. Press “**DOWN**” key 5 times until the instrument displays:

OUTPUT ALARM
Flow :EN

fig. 21

Press “**UP**” or “**DOWN**” keys to enable (EN) or disable (DIS) the **flow alarm output**.

Press “**ESC**” to move to the the selection **maximum dosing time alarm for pH**. Press “**UP**” or “**DOWN**” keys to enable (EN) or disable (DIS) the flow alarm output.

OUTPUT ALARM
MAX DOS PH :EN

fig. 22

Press “**ESC**” to move to the the selection **maximum dosing time alarm for Chlorine**. Press “**UP**” or “**DOWN**” keys to enable (EN) or disable (DIS) the flow alarm output.

OUTPUT ALARM
MAX DOS CL :EN

fig. 23

ELECTRICAL WIRING

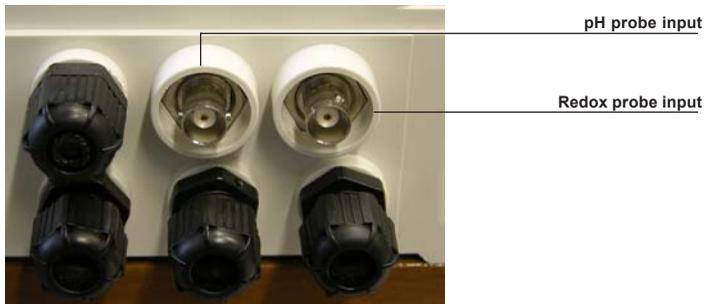
Connect the instrument to the power supply using a standard "SCHUKO" plug supplied. Before starting any electrical connection perform the following operation:

- ensure a correct ground installation!
- if there is a bad ground, install a differential switch with high sensibility (0,03 A) as additional protection from electric shocks!
- check that pump voltage corresponds to supply voltage!
- make ground connection before any other connection!

All electrical connections are made by means of watertight bayonet connectors (BNC) for rapid and safe installation, located on the underside of the pumps group. To start the pumps group, proceed as follows: Connect the pumps group to the mains electricity supply (230Vac \pm 10%), using the plug supplied, and check that the mains earth circuit is up to standard by testing its efficiency. Avoid possible damage to the pumps group caused by extra voltage.

PROBES CONNECTIONS

Connect pH and Redox probes through BNC connectors as shown

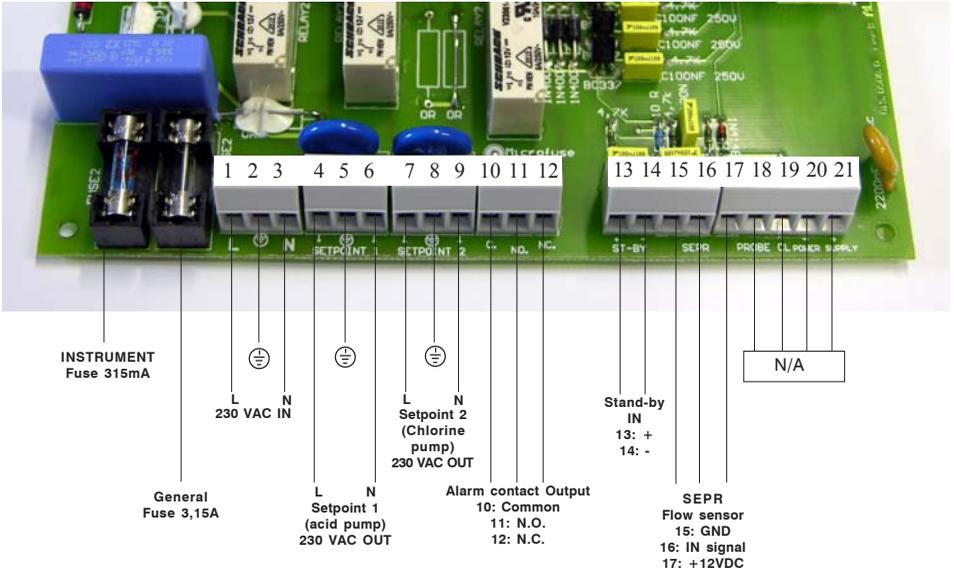


lateral bottom view

ELECTRICAL PROTECTION

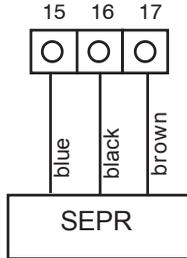
Internal circuit is protected against electrical noises using the EMC system and a fuse. To replace the fuses remove the frontal-low cover (trained personnel only):

- unplug power supply
- remove the 2 screws on the frontal-low cover using a screw-driver
- locate the fuse on the circuit board
- replace the fuse using fuse with the same features (see Electrical wiring)
- fasten back cover making sure the sealing materials is properly placed.



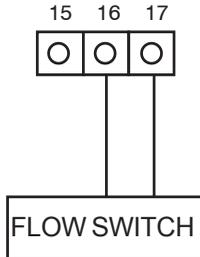
SEPR “Flow Sensor” connection

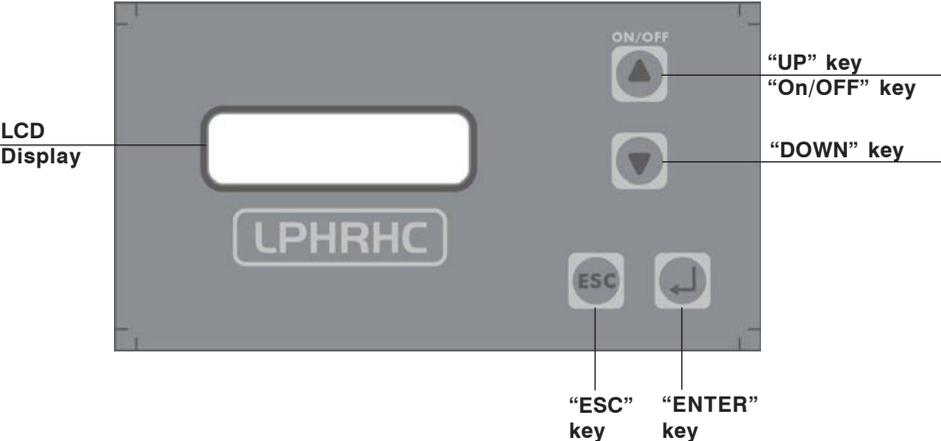
A proxy sensor model “SEPR” can be used to sense the flow inside the probe holder, make wirings as follows: GND to terminal n.15; input signal to terminal n.16; +12VDC to terminal n.17.



Flow switch connection

To install a flow switch connect as follow:





ERROR MESSAGES TABLE

During calibration the instrument can display error messages depending on the problem pointed out.

ERROR #01:

The same calibration value has been set for both the first and the second calibration point.

Solution: Use different values.

ERROR #02:

The same buffer solution has been used for both the first and the second calibration point.

Solution: Use different buffer solutions.

ERROR #03:

The gain value (GAIN) of the probe is out of range.

Solution:

Verify the correct buffer solution value and/or verify the correct probe functioning.

ERROR #04:

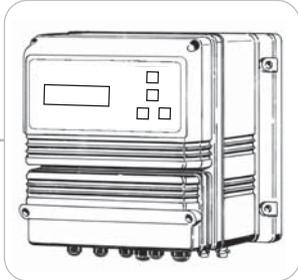
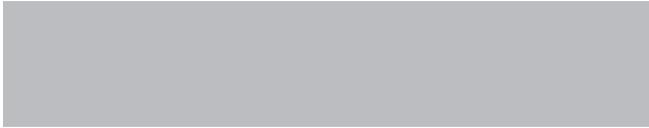
The OFFSET value of the probe is out of range.

Solution:

Verify the correct buffer solution value and/or verify the correct probe functioning.



Drawings and technical features are subject to changes and modifications without any advice.



*When dismantling a pump 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.*