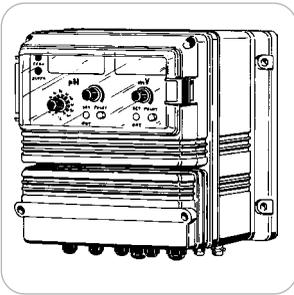




This manual contains important safety information about installation and use of this equipment. Ignoring this information could result in injuries or damages.



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



## “LPHCL1” CONTROLLER OPERATING MANUAL

Read carefully!



ENGLISH Version

R1-04-04



“LPHCL1” 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!

General description	page 4
Electrical connections	page 4
pH meter adjustment	page 5
Automatic temperature compensation	page 5
pH set point adjustment	page 6
Stand-by	page 6
Delay	page 6
ECL1 Chlorine cell calibration	page 7
HClO Dissociation Curve	page 7
Chlorine set point adjustment	page 8
pH probe cleaning and storage	page 9
pH current output	page 9
Cl current output	page 9
Accessories	page 9
Technical features	page 10
Installation wiring diagrams	page 11

## GENERAL DESCRIPTION

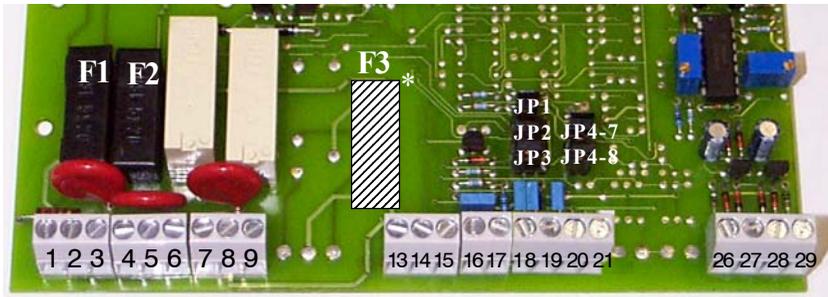
“LPHCL1” is an instrument to analyse and control both pH and Free chlorine (or Chlorine Residual) into water visualizing pH and mg/l Cl<sub>2</sub> values. “LPHCL1” can be connected to any standard pH electrodes (i.e.: **ECL/1**). “LPHCL1” provides two pH Set-point with independent adjustment and one setpoint for Cl meter with ON/OFF output; “LPHCL1” features a 0÷20 mA output to connect a chart recorder or a remote control. “LPHCL1” is housed into an “ABS” plastic casing rated IP65. Box dimensions are 215x215x125mm with four fixing points to ensure steady and safe mounting. Friendly user controls for calibration and adjustment operations are easy to access and protected with a transparent poly-carbonate climp-on cover.

## ELECTRICAL CONNECTIONS

All electrical connections to LPHCL1 can be performed through the internal connector clamp placed at the front bottom of the casing: to access unscrew front bottom cover. Before to do any connection **disconnect the instrument from power supply** and:



- **verify and check carefully system ground**
- **install 0,03 A breaker to prevent current peeks due to poor ground system**
- **ensure power supply conforms to pump label**
- **connect ground before proceeding with other electrical connections**



- 1-2 : 230Vac power supply
- 3-4 : 230 Vac Output for SetPoint pH (acid / base)
- 5-6 : 230 Vac Output for SetPoint Cl (disinfectant)
- 7-8-9 : Ground
- 13-14-15 : “SEPR” probe +V(13) ; Signal(14); -V(GND15)
- 16-17 : Temperature probe
- 18-19-20-21: ECL1(18: brown), (19: white), (20: green), (21: yellow)
- 26-27 : Current output 26(+); 27(-) for Chlorine
- 28-29 : Current output 28(-); 29(+) for pH

- JP1** Configuration Jumper for Set-Point pH
- JP2** Configuration Jumper for Set-Point Cl
- JP3** Temperature probe Automatic / Manual
- JP4** Delay time
- \* Available only on “Free of Voltage” contact

## pH METER REGULATION

Connect pH electrode to the BNC connector then calibrate the electrode:

- Verify power supply shown on the controller tag ( $\pm 10\%$  from tag) the connect to mains.
- Connect pH electrode (blue cap on cable side) to BNC placed at the bottom left external the casing and remove the electrode tip rubber protection cap.
- When utilising the Manual Temperature Compensation feature, select working Temp. shown on buffer solution tag turning knob “°C”.

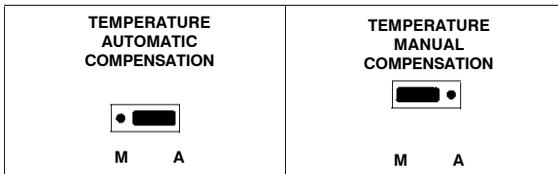


***Before dipping the electrode into the buffer solution bottle, wash thoroughly with water then shake it and dry it, without rubbing, to prevent “poisoning” the electrode reference solution. Rubbing the electrode causes electrostatic charge that modifies reading values.***

- Deep pH electrode into pH 7.00 (BSB) buffer solution, shake both for about one minute (during electrode calibration is necessary that reading is steady), then adjust the ZERO with screwdriver until the display shows the buffer solution value.
- Deep pH electrode into pH 4.00 (BSA) or pH 9.2 (BSB) buffer solution, shake both for about one minute (during electrode calibration is necessary that reading is steady) then adjust the SLOPE with screwdriver until the display shows the buffer solution value.
- Select working Temp. shown on buffer solution tag turning knob “°C” ( only if controller is used with Manual Temperature Compensation).
- Install Probe temperature ETE (only if working with Manual Temperature Compensation).
- Insert electrode into de-flux holder (PED); where is possible insert both pH and °C probes in the same holder.

## AUTOMATIC TEMPERATURE COMPENSATION

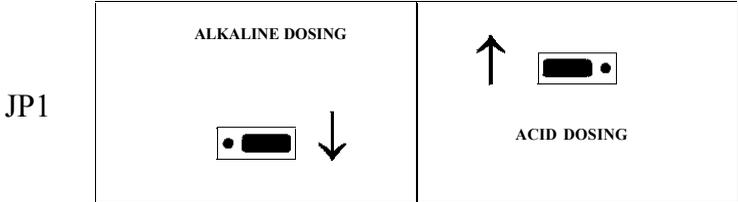
Automatic temperature compensation is available using a temperature probe ETE (or ETEP) NTC 10Kohm. The LPHCL instrument is designed to work with manual or automatic compensation as required. If not specified the instrument is equipped with manual compensation. To set the jumper, remove the two screws and lift the lower cover. Once the jumper JP3 is located, follows the picture below: :



JP3

## PH SET-POINT ADJUSTMENT

Pressing the button situated below the set-point knob, displays the previous stored value. To change them keep pressed and set the required pH value by using the pH set-point knob. When the yellow LED is turned on, the current out signal is activated on terminals 17-18. In order to set the instrument for an acid or alkali dosing, it is necessary to select the proper jumper configuration. To set the jumper lift the lower cover. Once the jumper JP1 is located, see the following picture.

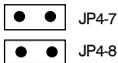


## STAND-BY

“Stand-By” is activated automatically when there no water’s flow into electrode holder. This function is suitable when operator wishes to shut off the system for maintenance purpose (i.e.: cleaning pool filters) but keeping instrument measurement active. Automatic “Stand-By” function is possible with the proximity probe “SEPR” connected to the instrument. When “Stand-By” red Led is On, pH and Cl outputs are disabled while instrument measurement is constant. Once incoming water flow is restored into the Cell, “Delay” red Led is winking activating this function: dosing operations will start after selected time delay thus allowing water into the cell for correct measurement. pH and Cl outputs are active when delay time is over. To select the “DELAY” time, position jumpers JP4 as shown in following paragraph.

## DELAY

“Delay” function starts when turning ON the instrument or after a “Stand-By” cycle and automatically disable all outputs allowing a correct polarization of all connected electrodes. Timing selection is available positioning jumper JP4 as follows:



<b>Delay</b>	JP4-7	C	C	O	O
	JP4-8	C	O	C	O
<b>Ttime of Delay</b>		10"	15'	30'	60'

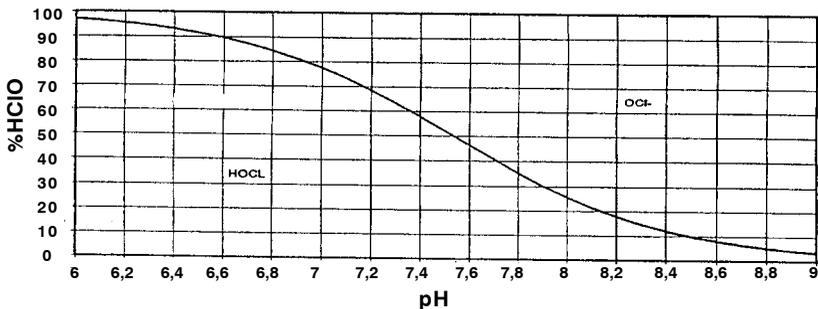
**C(closed) O(open)**

## ECL1 CHLORINE CELL CALIBRATION

Once instrument is correctly installed, to calibrate ECL1/2/3 amperometric chlorine cell, proceed as follow:

- unscrew bottom protection cap (do not touch or remove the membrane!)
- fill the membrane cap with electrolyte keeping electrode in vertical position then reassemble the cell avoiding that hands come in contacts metal parts. If electrolyte drips out when putting cap back, is not a problem
- connect Cell wires to LCL/1 internal clamp connector as in page 4
- run water from system to be treated into Cell and PEF2 and regulate incoming flow rate to about 30 l/h: adjust flow rate by means of PEF2 flux meter screw until floater top reaches PEF2 indicated level
- remove all air bubbles into the Cell to prevent reading error
- run water flow into Cell ECL1/2/3 for approximate 30 minute
- shut water flow into Cell and wait to stabilize the reading: in this conditions instrument must read 0,00 mg/l of free chlorine.
- Adjust the "Zero" by means of front panel controls potentiometer using a screwdriver until display shows 00,00 mg/l.
- Adjust the "Zero", front panel controls, until display shows 00,00 mg/l
- re-open water and take water sample at the electrode holder outlet, analyze it using colorimetric system (type DPD1) or by means of photometer.
- with screwdriver adjust "GAIN" front panel potentiometer until display shows same value obtained with colorimetric analysis.
- repeat amperometric cell calibration few times during initial days of operation or repeat calibration every time pH changes into the water system to be treated (refer to "Dissociation Curve HClO" herein below).

### *HClO Dissociation Curve*



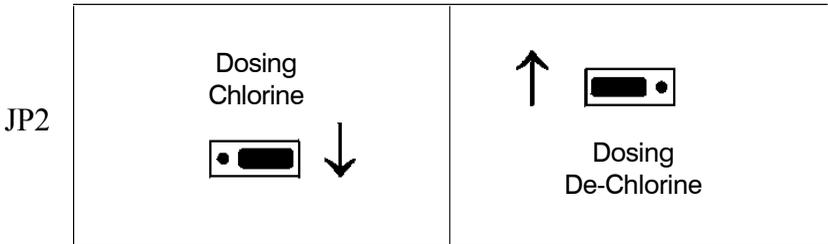
**NOTE**

If itsn't possible to calibrate chlorine correctly, please read as follows:  
open the instrument by removing the screws  
pull the display board and locate the trimmer as shown  
turn the trimmer until to obtain a good CHLORINE calibration



**CHLORINE SETPOINT ADJUSTMENT**

Pressing the button situated below the set-point knob, displays the previous stored value. To change them keep pressed and set the required pH value by using the pH set-point knob. When the yellow LED is turned on, the current out signal is activated on terminals 5-6. In order to set the instrument for chlorine or de-chlorine dosing, it is necessary to select the proper jumper configuration. To set the jumper lift the lower cover. Once the jumper JP2 is located, see the following picture.



## pH PROBE CLEANING AND STORAGE

pH probe must be cleaned once per month to ensure a correct instrument functioning without slow responses of the reading. Dip probe in HCl for 5 minutes and rinse with fresh water to clean them. Correct probe functioning is ensured keeping them always wet. Shipping bottle solution is an ideal environment for long term storages, do not remove it until installation. Use a KCl 3M solution to wet the probe terminals if the shipping solution is not available, for short time storages the fresh water can be enough. Probe should be replaced in case of slow or not correct responses of the reading.



**Do not use distilled water for pH probe storage. Do not wipe probes terminals. Probes are not covered by warranty. Don't cut or resize probe's cable.**

## pH CURRENT OUTPUT

On terminals 28-29, there are a proportional current signal to the displayed values (0÷20mA or 4÷20mA on request):

$$0 \div 14 \text{pH} = 0 \div 20 \text{mA} ; 4 \div 20 \text{mA}$$

Max resistance load : 330 Ohm

*Output current range is printed on the instrument label.*

*Output current signal without galvanic isolation, galvanic isolation is available on demand.*

## CI CURRENT OUTPUT

On terminals 26-27, there is a proportional current signal to the displayed values (0÷20mA or 4÷20mA on request):

$$0 \div 10.00 \text{mg/l} = 0 \div 20 \text{mA} ; 4 \div 20 \text{mA}$$

Max resistance load: 330 Ohm

*Output current range is printed on the instrument label.*

*Output current signal without galvanic isolation, galvanic isolation is available on demand*

## ACCESSORIES

- N. 4 Dibbles ø6
- N. 4 Self threading screws 4.5x40
- N. 1 Instruction booklet
- N. 1 Fuse 0,315A

## TECHNICAL FEATURES

Power Supply: 230 VAC  $\pm$  10%

Consumption: 12 Watt

Range: 0  $\div$  10.00 mg/l chlorine ; 0  $\div$  14 pH

Resolution:  $\pm$  0.01 mg/l chlorine ;  $\pm$  0,01pH

Input Current: 20 femptoamps

Asimmetric potential compensation (Zero) :  $\pm$  0.5mg/l ;  $\pm$  2pH

Slope :  $\pm$  20%

Weight: 2,5 Kg

Protection: IP65

Manual Temperature Adjustment: 0  $\div$  80°C

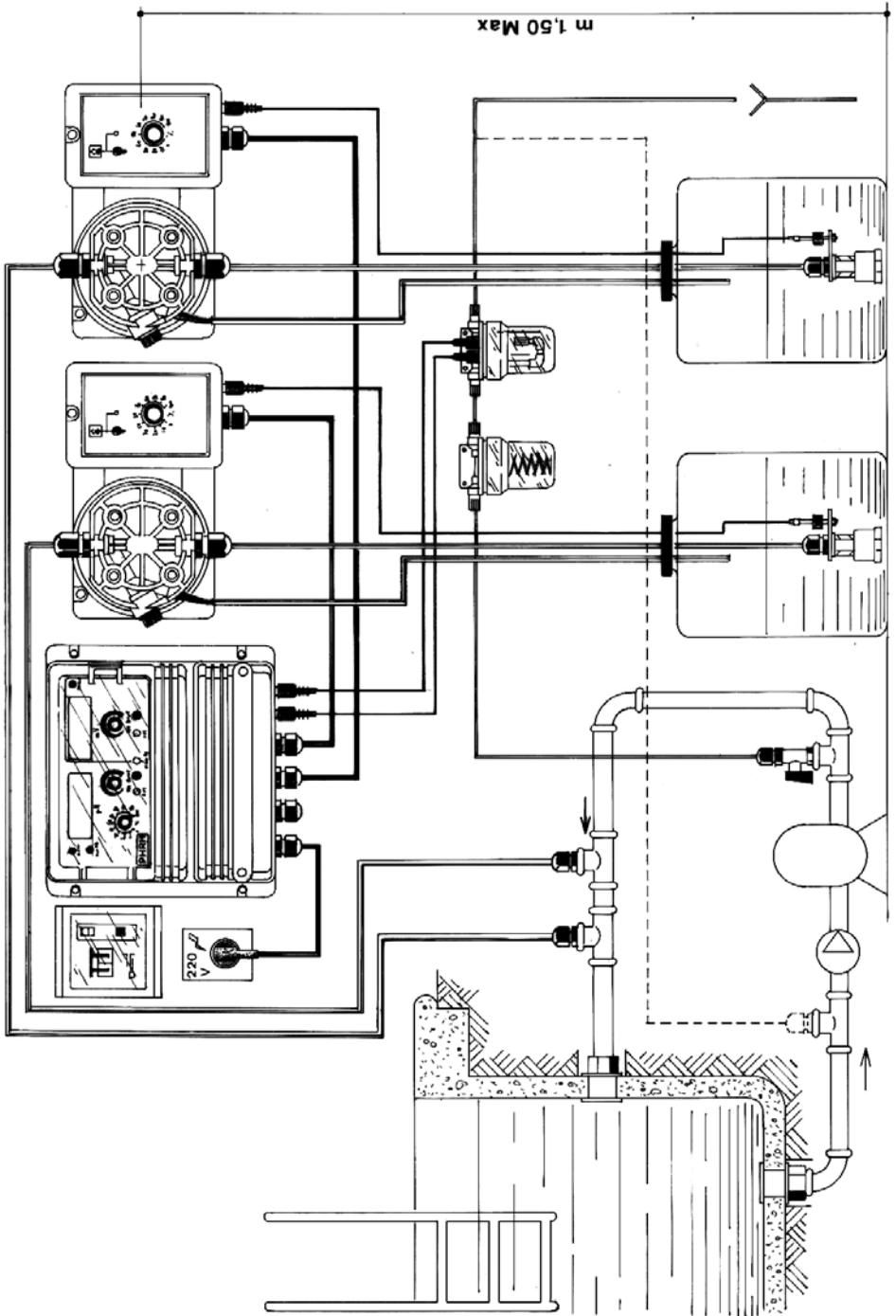
Enviroment Working Temperature: 0  $\div$  50°C

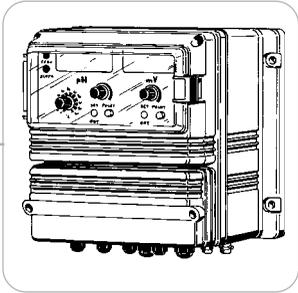
F1 fuse : General's fuse (2A)

F2 fuse : Instrument's fuse (0,3A)



***Attention: technical features and functions may change without notice***





*When dismantling an 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.*