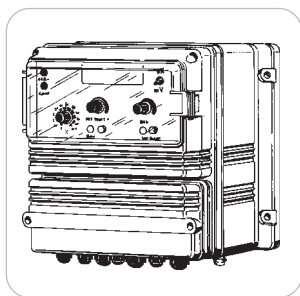




This manual contains important safety information about installation and use of this equipment. Ignoring this information could result in injuries or damages.



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



“ LPHS ” CONTROLLER OPERATING MANUAL

Read carefully!



ENGLISH Version

R1-02-03



“LPHS” 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 authorized personnel only!

Always read chemical safety datasheet!

Always wear protective clothing when handling hazardous or unknown chemicals!

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GENERAL DESCRIPTION

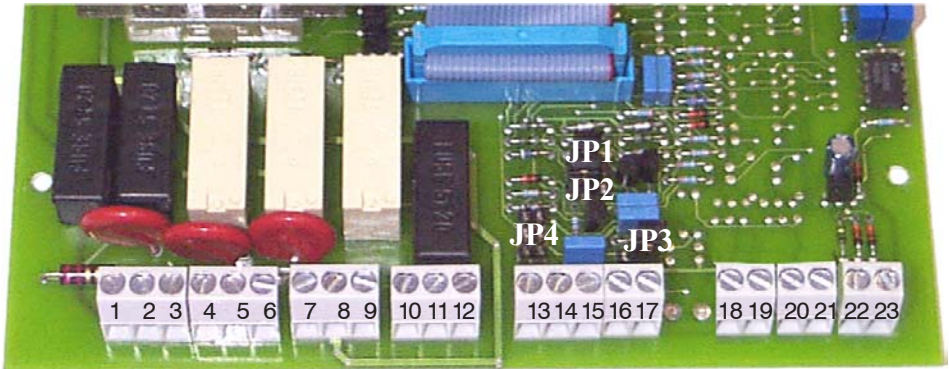
“LPHS” instrument measures and adjust ORP (mV) or pH during industrial control process such as pH adjustment or free chlorine regulation in swimming pools. It has two set-point (On/Off) and one proportional isolated current signal (4÷20 mA) for a printer or a remote control. Read values are showed on a display for readings in high light environment. Instrument is housed into a plastic made case (ABS) for wall mounting with IP65 grade protection. Dimensions are : 215x205x130mm. Installing screws are the corner of a 195mmx141mm rectangle. Instrument adjustments and displays are protected by a transparent polycarbonate cover. A Stand-by function allows to disable metering pumps in case of filter back-wash of swimming pool. This safety function starts during the instrument boot sequence and allows electrodes polarization.

ELECTRICAL CONNECTIONS

Electrical wirings are placed beneath the lower frontal cover. In order to access them, remove screws and flip it up to open it. Before to proceed with wiring **unplug power supply** and strictly observe the followings:



- **check and ensure ground system works as per your country normatives**
- **install a (0.03 A) differential breaker in case of inefficient grounding**
- **wire grounding before any other connection**
- **check and ensure power supply is correct**



Electrical wiring :

1-2 : 230 VAC Power Supply

3-4 : 230 VAC Output left SetPoint pH (acid / alkali pump)

5-6 : 230 VAC Output right SetPoint pH (acid / alkali pump)

7-8-9 : Ground

10 -11 : Free of voltage contact alarm N.O.

11- 12 : Free of voltage contact alarm N.C.

13-14-15 : “SEPR” Proximity sensor +V(13) ; Signal(14); -V(GND15)

16-17 : Temperature probe

18-19 : 4÷20 mA Alkali proportional set point ; 18(+); 19(-)

20-21 : 4÷20 mA Acid proportional set point ; 20(+); 21 (-)

22-23 : Chart recorder output current 22(+); 23(-)

JP1 Set-Point 1 : configuration jumper

JP2 Set-Point 2 : configuration jumper

JP3 Temperature configuration Jumper Automatic / Manual

JP4 Delay time and Dosing alarm configuration jumper

pH ADJUSTMENT

It is necessary to proceed with the probe calibration once connected the pH probe to the BNC connector.

- Check and ensure power supply is within $\pm 10\%$ of tag value before supply power to the instrument.
- Connect the pH probe (the one with blue cable cap) to the BNC connector placed in the lower panel of the case.
- Set the buffer solution temperature, using the ($^{\circ}\text{C}$) knob of the instrument, if working with manual temperature compensation. Dip otherwise, using the automatic temperature compensation, the temperature probe in the buffer solution while performing the probe calibration.

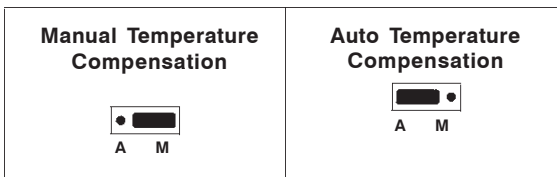


Abundantly rinse with water the probe and dry it shaking it (do not wipe it) before dip it in the buffer solution in order to avoid buffer solution contaminations.

- Dip the pH probe in a pH 7.00 buffer solution (BSB), shake and wait one minute to stabilize reading. Use a screwdriver to adjust the ZERO regulation on the front panel to read on the instrument display the buffer solution value.
- Dip the pH probe in a pH 4.00 buffer solution (BSA), or pH 9.2 buffer solution (BSC), shake and wait one minute to stabilize reading. Use a screwdriver to adjust the SLOPE regulation on the front panel to read on the instrument display the buffer solution value.
- Set the system working temperature, using the ($^{\circ}\text{C}$) knob, if using manual temperature compensation. Install otherwise, using automatic temperature compensation, the temperature probe (ETE) on the system to be monitored.
- Install the pH probe in the off line probe holder. Using a PED probe holder it is possible to install both temperature and pH probes in the same holder.

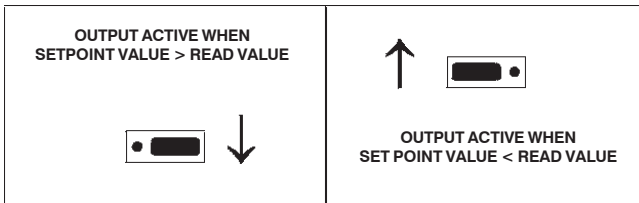
TEMPERATURE COMPENSATION (AUTOMATIC OR MANUAL)

“LPHS” instrument is capable of automatic temperature compensation using an ETE probe (NTC 10Kohm). See introduction for probe's electrical wiring. The instrument is configured to perform both automatic or manual temperature compensation. If not otherwise specified the instrument is configured for manual temperature compensation. Temperature compensation can be configured using the jumper JP3 located on the main board. JP3 jumper configuration can be:



ON/OFF SET POINT FOR pH

While pressing the “SetPoint” 1 or 2 button the display will show the value of selected set-point. To change this value while pressing the “SetPoint” 1 or 2 button rotate the set-point knob until the display will show the right value. When the “SetPoint” yellow led is on, selected output is activated and on boards block there is current that can be used for a metering pump or for an alarm. Led is active when pH value is > or < than the set value (on SP1 or SP2). To set up the output configure the following jumpers as shown (Jp1 is for SP1; JP2 is for SP2)

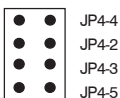


STAND-BY

On demand, is available an input signal (Stand-by) on “SEPR” blocks. Using this input (connecting the proxy probe using the three wires brown, blue, black) is possible to disable the SETPOINT outputs leaving the reading active. This procedure can be useful during filters cleaning or a situation in which the swimming pool recycle is halted. “SP1” and “SP2” outputs are disabled when the “SEPR” light is off. “Stand-by” can be activated using a N.C. contact on blocks 13-14-15. N.C. can be taken from an auxiliary contact of the recycle pump breaker or from a relay driven by the recycle pump breaker. This function is working when the “Stand-by” led is on and blocks 10-11-12 are active for an alarm signal.

DELAY AND DOSING ALARM

This safety function starts during the pump’s boot sequence and allows electrodes polarization. Using jumpers JP4 possible to set-up how many seconds this function must be on:



Delay	JP4-4	C	C	O	O
	JP4-5	C	O	C	O
Time		10'	15'	30'	60'
Alarm	JP4-2	C	C	O	O
	JP4-3	C	O	C	O
Time		10'	15'	30'	60'

C(with jumper) O(without jumper)

ORP ADJUSTMENTS

It is necessary to proceed with the probe calibration once connected the ORP probe to the BNC connector.

- Check and ensure power supply is within $\pm 10\%$ of tag value before supply power to the instrument.
- Connect the ORP probe (the one with yellow cable cap) to the BNC connector placed in the lower panel of the case.

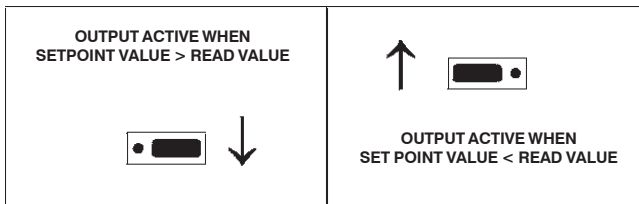


Abundantly rinse with water the probe and dry it shaking it (do not wipe it) before dip it in the buffer solution in order to avoid buffer solution contaminations.

- Dip the ORP probe in a 650 mV buffer solution (BSD), shake and wait one minute to stabilize reading. Use a screwdriver to adjust the ZERO regulation on the front panel to read on the instrument display the buffer solution value.
- Install the pH probe in the off line probe holder (PED) or directly on the system pipings using a PEA probe holder.
- Install a filter (100 micron) before the probe holder in order to reduce probes maintenance.

ORP SET POINT ADJUSTMENTS

Keep pressed the push button beneath the “Setpoint” knob to read on the display the setted value. To change this value; keep pressed this pushbutton and set the new set point using the knob. When the yellow LED “Setpoint” is on the “BLK / WHT” output on terminals 5 and 6 of the terminal block showed in section 3 is active to run a metering pump or an alarm. It is optionally available a free voltage contact (N.O.) on terminals 5 and 6. Output is active when the redox reading is lower or higher than redox set point . “**S.Point**” jumper configuration is (Jp1 is for SP1; JP2 is for SP2):



PROPORTIONAL SETPOINT

Keep pressed the push button beneath the “Setpoint” knob to read on the display the setted value. To change this value; keep pressed this pushbutton and set the new set point using the knob. When the yellow led “ACID” is on, the output current for the metering pump is available on blocks n. 20-21. Otherwise when the yellow led “ALKALI” is on, the output current is active on blocks n.18-19. The gain knob multiply the output current by the selected number.

“GAIN” ADJUSTMENT

“Gain” adjustment allow user to multiply current’s value on “SetPoint Proportional” with set value. Keep in mind that the maximum value of current output is always 20mA. For best results use this table: (calculating the pump’s flow capacity, additive concentration, plant dimension).

DISPLAY LPHS (mV)	S.P.P.* (mV)	GAIN	ACID (mA)	ALKALI (mA)
00.00	00.00	1	0	0
00.00	1000	1	0	20
1000	00.00	1	20	0
1000	500	1	10	0
500	1000	1	0	10
500	550	1	0	1
500	550	20	0	20
550	500	1	1	0
550	500	20	20	0

*S.P.P: “SetPoint proportional”

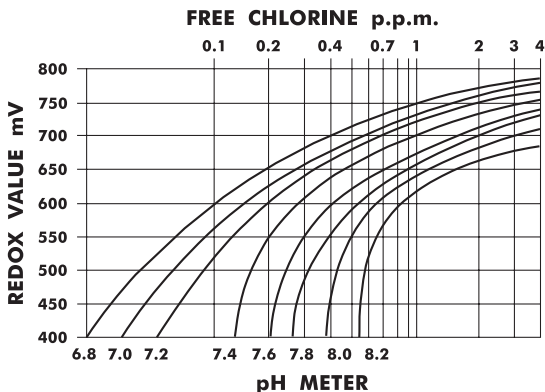
“LPHS” AS A FREE CHLORINE METER : SET UP

It is necessary to proceed with the probe calibration once connected the ORP probe (the one with yellow cable cap) to the BNC connector. Check and ensure power supply is within $\pm 10\%$ of tag value before supply power to the instrument.



Abundantly rinse with water the probe and dry it shaking it (do not wipe it) before dip it in the buffer solution in order to avoid buffer solution contaminations.

- Use the water to be treated to prepare a chlorine solution in similar percentage of the desired system working value using a DPD1.
- Measure pH of the water sample. This measure will be required to convert the ORP (mV) reading in free chlorine p.p.m.
- Dip the ORP probe in the prepared solution, shake and wait until the reading is stabilized. Use a screwdriver to adjust the ZERO regulation on the front panel to read on the instrument display the ORP potential referred in the following table to the free chlorine p.p.m. solution prepared at the previously measured pH.



- Install the pH probe in the off line probe holder (PED) or directly on the system pipings using a PEA probe holder.

- Install a filter (100 micron) before the probe holder in order to reduce probes maintenance.



Only use water to be treated to prepare the free chlorine solution. Using different samples of water the reading may change up to $\pm 50\text{mV}$.

PROBES CLEANING AND STORAGE

Probes must be cleaned once per month to ensure a correct instrument functioning without slow responses of the reading. Dip probes in HCl for 5 minutes and abundantly 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 time 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. Probes should be replaced in case of slow and/or not correct responses of the reading.



Do not use distilled water for probes storage. Do not wipe probes terminals. Probes are not covered by warranty.

CURRENT OUTPUT

On "Current Out" (22-23) blocks there are current signal proportional to the displayed values ($0\div 20\text{mA}$ or $4\div 20\text{mA}$ as request) :

$$\begin{aligned}0\div 1000\text{mV} &= 0\div 20\text{mA} ; 4\div 20\text{mA} \\0\div 14\text{pH} &= 0\div 20\text{mA} ; 4\div 20\text{mA} \\ \text{Max resistance load} &: 500 \text{ Ohm}\end{aligned}$$

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 $\varnothing 6$
- N. 4 Screws 4.5x40
- N. 3 Fuse (see next chapter for details)
- N. 1 This instruction manual

TECHNICAL FEATURES

Power supply : 230 Vac \pm 10% ; Consumption : 7 Watt

Range measurement : 0 ÷ 1000 mV ; 0 ÷ 14 pH

Resolution : \pm 1mV ; \pm 0,01pH

Input current : 20 femptoamps

Asymmetric potential compensation (Zero) : \pm 100mV ; \pm 2pH

Hysteresis set-point : \pm 10mV ; \pm 0,1pH

Slope : \pm 20%

Weight : 1,5 Kg

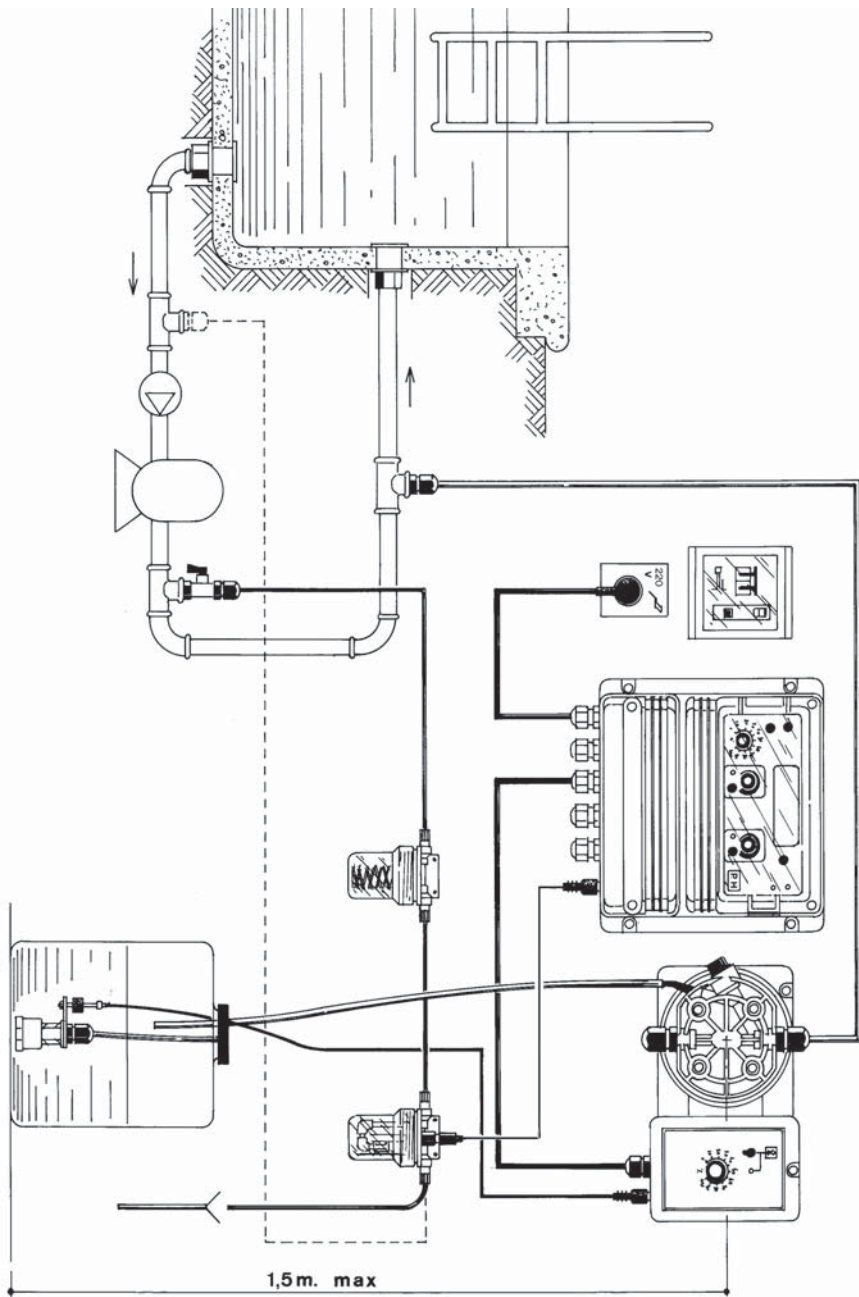
Protection standard : IP65

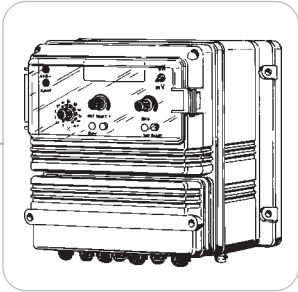
Manual temperature adjustment : 0÷ 80°C ; Environment working temperature : 0÷ 50°C

Instrument's fuse (0,3A)

pH relay's fuse (1A)

mV relay's fuse (1A)





*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.*