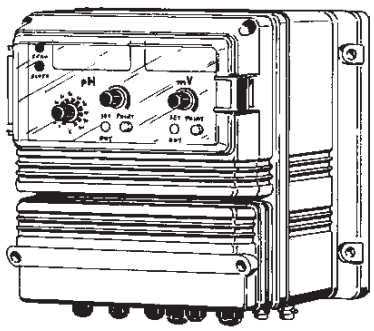
This manual contains important safety information about installation and use of this equipment. Ignoring this information could result in injuries or damages.

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



"LPHRH" CONTROLLER OPERATING MANUAL

Read carefully!

ENGLISH Version

R1-02-03

"LPHRH" 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!

Index

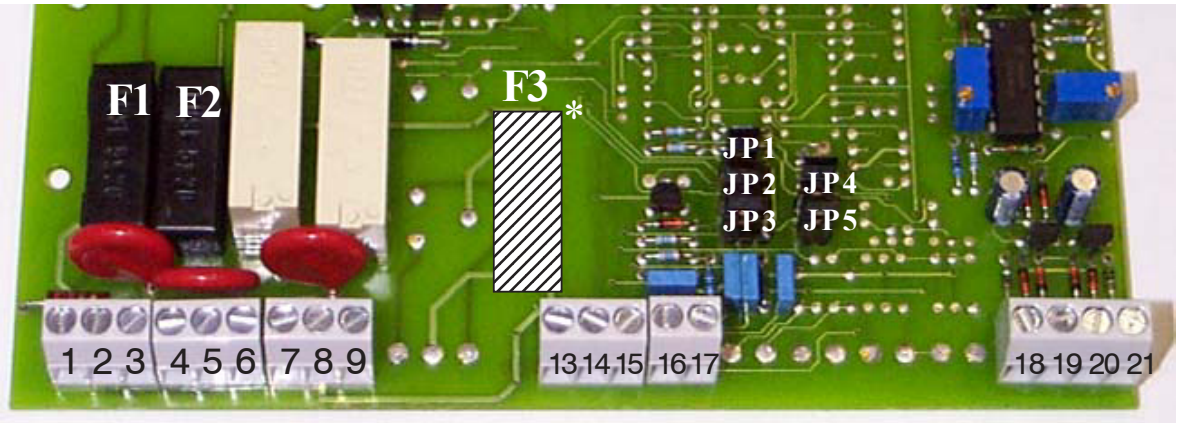
GENERAL DESCRIPTION

"LPHRH" instrument measures and adjust pH and ORP (mV) parameters during industrial control process such as pH adjustment or free chlorine regulation in swimming pools. It has two set-point for two On/Off signals and two proportional current signals (0÷20 mA - 4÷20 mA) for a printer or a remote control. Read values are showed on two red units display (high clear 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 closed by two screws. A Stand-by function allows to deactivate metering pumps in case of water lack into swimming pool. This safety function starts during the pump's boot sequence and allows electrodes polarization.

ELECTRICAL CONNECTIONS

Electrical wirings are made on the terminal blocks placed beneath the lower frontal cover, 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 SetPoint pH (acid / base pump) or Free of Voltage contact
5-6 : 230 VAC Output SetPoint Rh (Disinfectant pump) or Free of Voltage contact
7-8-9 : Ground
13-14-15 : "SEPR" Proxy sensor +V(13) ; Signal(14); -V(GND15)
16-17 : Temperature probe
18-19 : Rh mA current output 18(+) ; 19(-)
20-21 : pH mA current output 20(-) ; 21(+)

JP1 Configuration Jumper for acid or alkali
JP2 Configuration Jumper for antioxidant or chlorine
JP3 Configuration Jumper Automatic / Manual temperature compensation
JP4 - JP5 Configuration Jumper Delay time
F1 / F2 see last page
* available only in Free of Voltage model

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 ±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 (°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 regolation 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 regolation on the front panel to read on the instrument display the buffer solution value.

- Set the system working temperature, using the (°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)

“LPHRH” 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:

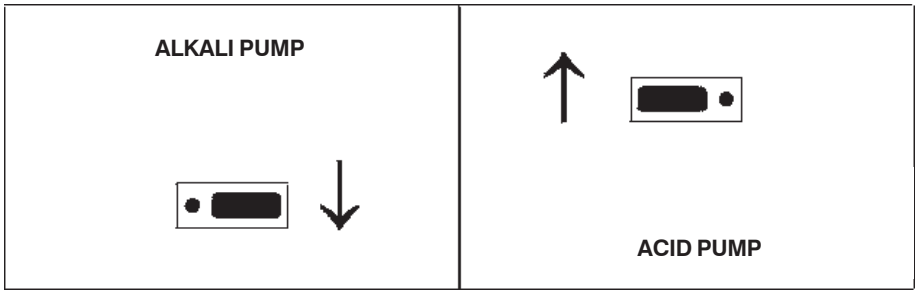
Manual Temperature Compensation	Auto Temperature Compensation
	

JP3

ON/OFF SET POINT FOR pH

While pressing the “SetPoint” button the display will show the value of selected set-point. To change this value while pressing the “SetPoint” 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 (3 - 4) 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. To set up the output configure the following jumpers as shown (Jp1):

JP1

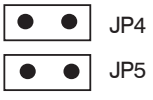


STAND-BY

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 activated. This procedure can be useful during filters cleaning or a situation in which the swimming pool recycle is halted. When there isn’t enough liquid for dosing the “Stand-by” led is on. Once there is enough liquid for dosing the “Stand-by” led will begin to blink. This phase is called “Delay”. Using jumpers JP4 and JP5 is possible to set-up how many seconds this phase will be long. Remember that when the “SEPR” led is off the “SP1” and “SP2” outputs are not active. “Stand-by” can be activated using a N.C. contact on block n.13-14-15. The “Stand-by” contact can be connected to the supplementary switch contact of a ricycle swimming pool pump. “Stand-by” led is on when the input is active.

DELAY

The delay is active when the instrument is turned on. During this phase all outputs are not active. This safety function allows electrodes polarization.



Time	JP4	C	O	C	O
Delay	JP5	C	C	O	O
		10”	15’	30’	60’

C (closed) O (open)

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 ±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 regolation on the front panel to read on the instrument display the buffer solution value.

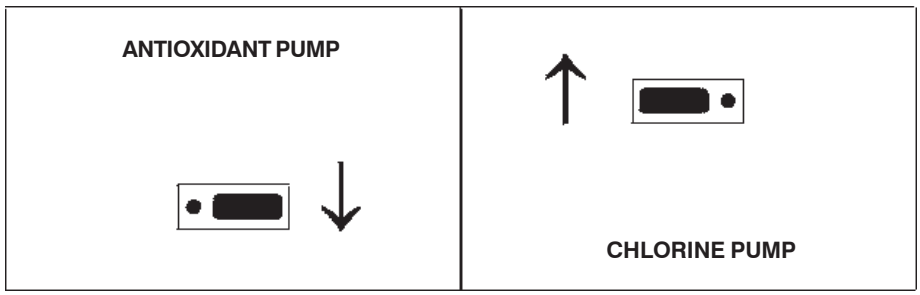
- Install probe in the off line probe holder (PED) or directly on the system pipings using a PEA probe holder.

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

ORP SET POINT SET UP

Keep pressed the pushbutton 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. To set the ORP “set point” locate JP2:

JP2

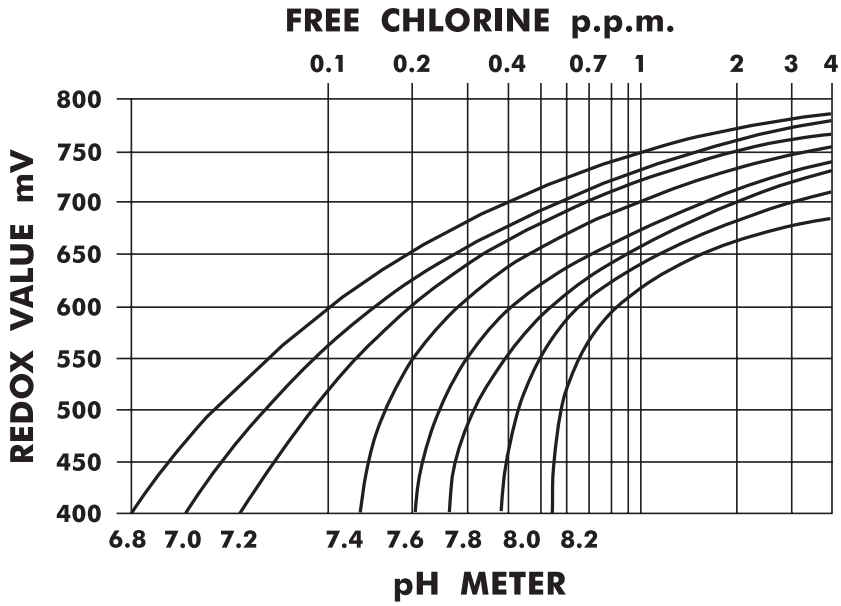


"LPHRH" AS A FREE CHLORINE METER : SET UP

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 ±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 untill 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 horder 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 ±50mV.

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 untill 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.

pH CURRENT OUTPUT

A *0÷20mA* current signal (*4÷20mA on demand*) proportional to the instrument reading is available at terminals 9-10 of the terminals block showed in section 3:

0÷14pH = 0÷20mA (4÷20mA)
Max load : 330 Ohm

Output current range (0÷20mA or 4÷20mA) is printed on the instrument label.
Output current signal without galvanic isolation, galvanic isolation is available on demand.

ORP CURRENT OUTPUT

A *0÷20mA* current signal (*4÷20mA on demand*) proportional to the instrument reading is available at terminals “current Out” F-G of the terminals block showed in section 3:

0÷1000mV = 0÷20mA (4÷20mA)
Max load : 330 Ohm
Output current range (0÷20mA or 4÷20mA) is printed on the instrument label.
Output current signal without galvanic isolation, galvanic isolation is available on demand.

ACCESSORIES

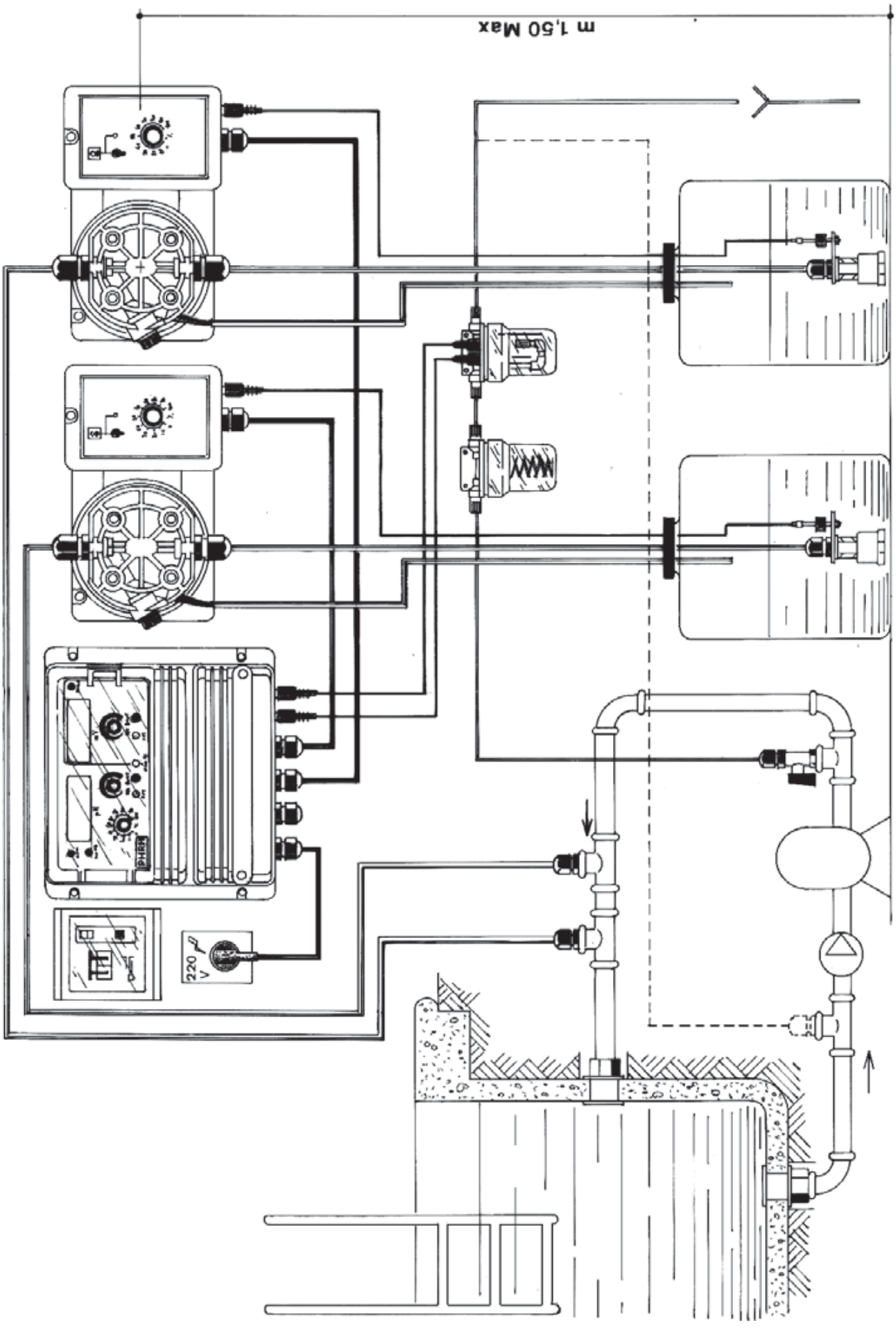
N. 4 Dibbles ø6
N. 4 Screws 4.5x40
N. 2-3 Fuse (see next chapter for details)
N. 1 Instruction manual

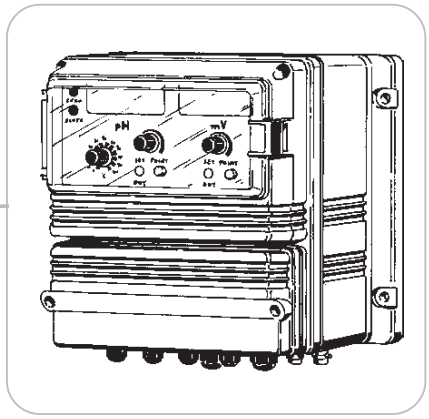
TECHNICAL FEATURES

Power supply : 230 Vac ± 10%
Power consumption : 6 Watt
Reading range : 0 ÷1000 mV ; 0 ÷14 pH
Resolution : ± 1mV ; ± 0,01pH
Input current : 20 femptoamps
Asymmetric potential compensation (Zero) : ± 100mV ; ± 2pH
Hysteresis set-point : ± 10mV ; ± 0,1pH
Slope : ± 20%
Weight : 2,5 Kg
Case : IP65
Manual temperature range : 0÷ 80°C
Working temperature environment : 0÷ 50°C

Fuse for “Free of voltage on block. 3-4 and 5-6” version :
F1 : Instrument’s fuse (0,3A)
F2 : pH relay’s fuse (1A)
F3 : mV relay’s fuse (1A)

Fuse for “220 Vac on block 3-4 and 5-6” version :
F1 : General’s fuse (2A)
F2 : Instrument’s fuse (0,3A)


m 1,50 Max
220 V



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.