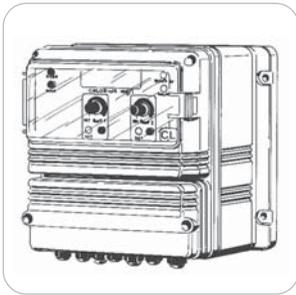




This manual contains important safety information about installation and use of this equipment. Ignoring this information could result in injuries or damages.



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



“ LCL1/3/8 ” CONTROLLER OPERATING MANUAL

Read carefully!



ENGLISH Version

R1-05-02



“LCL1/3/8” 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!

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!

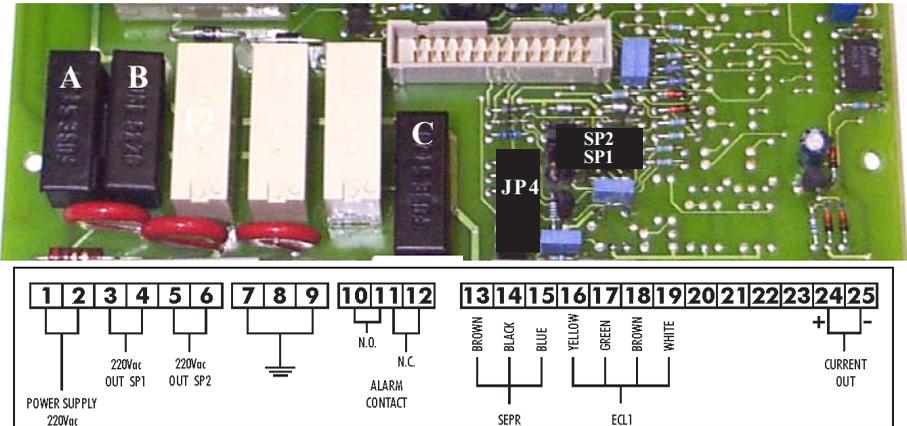
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INSTRUMENT DESCRIPTION

LCL/1 is an instrument to analyse and control Free chlorine (or Chlorine Residual) into water visualizing mg/l Cl₂ values. "LCL/1" controls CL₂ concentration present into the water system by measuring the Hypochlorous Acid-HClO obtained when dosing either Organic chlorine (ex: Isocyanuratic Chlorine) or when dosing Inorganic chlorine (ex: Sodium Hypochlorine). LCL/1 can be connected to EMEC amperometric Cl Cell types: **ECL/1**; **ECL/2**; **ECL3**. LCL/1 provides two Set-point independent adjustment and two ON/OFF output; furthermore it features a 0÷20 mA output to connect either a chart recorder or for long distance remote control. The 7-segments Display read out enables efficient reading even where environment does not allow easy-clear reading. LCL/1 is enclosed into "ABS" plastic casing rated IP 65. Casing dimensions are 215x215x125mm and four fixing points ensure steady and safe mounting. Friendly user controls for calibration and adjustment operations are easy to access and protected with a transparent polycarbonate cover with climp-on lock.

ELECTRICAL CONNECTIONS TO "LCL/1" METER

All electrical connections to LCL/1 can be carried out through the internal connector clamp placed at the front bottom of the casing: to access unscrew front bottom cover.



From left to right are shown the following connections duties:

- 1 ; 2 - "Power Supply 230V" mains input
- 3 ; 4 - "230 Out S.P.1" Set Point 1, 230 Vac output (Max 5A resistive)
- 5 ; 6 - "230 Out S.P.2" Set Point 2, 230 Vac output (Max 5A resistive)
- 7 ; 8 ; 9 - EARTH \perp
- 10 ; 11 - N.O. (Normally Open) "Alarm" contact
- 11 ; 12 - N.C. (Normally Close) "Alarm" contact
- 13 (Brown) 12 Vdc ; 14 (Black) Input ; 15 (Blue) ground - "SEPR"* proximity switch sensor
- 16 (yellow); 17 (green); 18 (brown); 19 (white) ECLx amperometric chlorine cell
- 24 (+) ; 25 (-) "Current Out"* 0÷20mA current output (upon request available: 4-20 mA, etc.)
- 20; 21; 22; 23; No connected

A "OUTPUTS S.P.1/2 FUSE" protection fuse for whole unit (2A T 5x20)

B "INSTRUMENT FUSE" instrument fuse (0,3A T5x20)

C "ALARM FUSE" connections clamp fuse (0,3A T5x20)

- JP1** Jumper Set-Point 1 configuration: selecting LCL/1 working field (Chlorating/De-Chlorating)
- JP2** Jumper Set-Point 2 configuration: selecting LCL/1 working field (Chlorating/De-Chlorating)
- JP3** Jumper Automatic / Manual Probe temperature
- JP4** Jumper to set instrument activating time delay

LCL/1 - ECL1/ECL2/ECL3 INSTALLATION

To install the instrument and Cl cell proceed as follow :

- install LCL/1 and EMEC electrode holder PEF2 onto the wall or vertical support ensuring that electrode holder is placed vertically
- install Chlorine cell ECL1 or ECL2 or ECL3 onto the wall or any vertical support ensuring that the two cell electrodes are placed horizontally: copper electrode at the right side (blue wire) and platinum electrode at left (red wire)
- connect electrode holder PEF2 inlet to the system to be treated (to prevent or reduce maintenance operation install a water filter, 80 micron, ahead of electrode holder). Connect PEF2 inlet (top position) to amperometric cell using hydraulic connections provided with the instrument. Connect Cell outlet to drain or compensation tank. If system pressure is not strong for incoming water flow into the Cell, connect Cell outlet to the system boosting pump suction side.
- install proximity switch SEPR into threaded fitting (PEF left side) and connect three wires as in page 4.
- turn LCL/1 On; when starting up the instrument, "Delay" function red Led will wink activating this function: dosing operations will start after selected time delay thus allowing water in for a correct measurement and for correct polarization of all connected electrodes (see paragraph "Delay").



For a correct use of LCL/1 install ahead of amperometric cell ECL1/2/3 a flow stabilizer (max 50 l/h max) or Emec electrode holder model "PEF2".

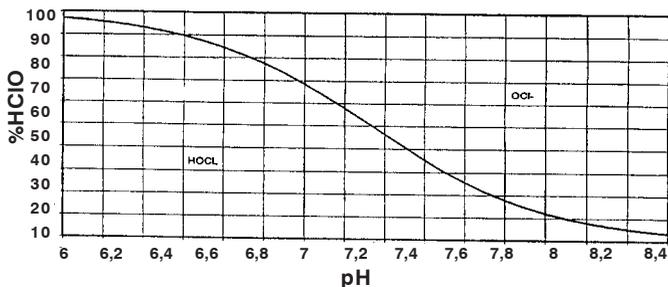
ECL1/ECL2/ECL3 CHLORINE CELL CALIBRATION

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).



ECL3 and ECL8 CALIBRATION

Use the same procedure as for ECL1 calibration but note that the "Dissociation Curve" doesn't fit for this probes. Starting from a value of 7pH into reading solution, the probe will reduce the reading value by 10% for every single pH read. For ECL3 probe (free chlorine) use a DPD1 system. For ECL8 probe (total chlorine) use a DPD4 system. Maximum concentration of stabilizer (isocyanuric acid) allowed by probe: 200mg/l.

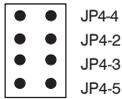
STAND-BY

"Stand-By" is activated automatically when water is not running through the Chlorine Cell: in this condition (No incoming water) Cl Cell will surely generate a reading error causing the dosing pump to continue injecting chlorine consequently increasing the chlorine residual value in respect of the requirements. Furthermore this function is suitable when operator wishes to shut off the system for maintenance purpose (ex. clean pool filters) but keeping instrument measurement active. The automatic "Stand-By" function is possible by means of the proximity switch "SEPR" connected to the instrument internal clamp connector with three wires: brown/blue/black. When front panel "Stand-By" red Led is On, outputs S.P.1-S.P.2 are deactivated whilst 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. Outputs S.P.1-S.P.2 are active once selected delay time cycle is over. To select the "DELAY" time, position jumpers JP4-7 and JP4-8 as shown in following paragraph.

"Stand-By" can also be activated by means of a voltage free N.O. contact, to apply to connectors 13-14-15. This control is available from the booster pump multi-pole auxiliary contact or from a relay multi-pole.

DELAY

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



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

C(Close) O(Open)

ALARM

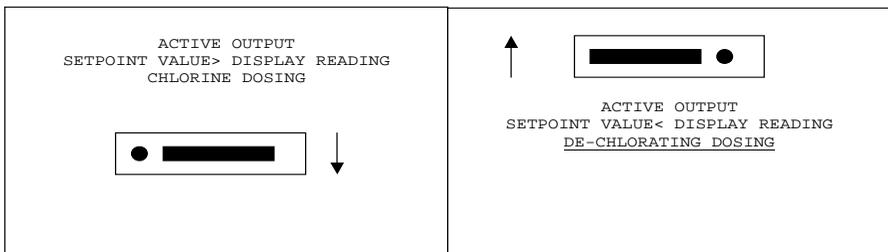
This function is designed to give an alarm when additive concentration into the system has not reached the required Set-point after the selected “Alarm” time period. Time ranges: 15 minutes (most common), 30 or 60 minutes. When the “Alarm” is activated, the operator should acknowledge that dosing pump is either not injecting or additive tank is empty or concentration is too low. To make “Alarm” function operative connect an alarm unit (light, sound, etc.) to LCL/4 internal clamp connectors relay output 10, 11, 12 (Voltage Free). To select “Alarm” time period position Jumpers JP4 and JP5 as shown in table herein below.

Alarm function will activate also when LCL/1 meter is in “Stand-By” condition (water is not running through electrode holder) and will deactivate once “Delay” time period is over.

SET-POINT ADJUSTMENT

To read selected Set-Point, press the button below the knob “Set-Point” 1 or 2 : to modify turn the knob “Set-Point” 1 or 2 while pressing the button until the display shows required Set-Point. When “Set-point” yellow Led is lit, correspondent output is active and on either one of connectors “230 Out S.P.1 or S.P. 2” there is power supply to connect dosing pump or other equipment.

When yellow Led is lit, free chlorine value shown on display is higher (or lower) than “Set-Point” 1 or 2 previously selected. To change instrument setting to higher (or lower) values than the one selected, a new configuration of the internal jumper is needed. To access to internal jumper, remove front cover, locate the jumpers, follow diagram here below:



ECLX CELL CLEANING AND MAINTENANCE

After a certain period of operation (6 months/1 year and according to the water quality parameters), or whenever calibration is not longer possible, chlorine cell must be cleaned. To carry out electrodes cleaning refer to instructions enclosed with Cell.

- if cleaning operation was succesfull, after approximate 24 hours measurement will stabilize in contrary change the electrodes.

OUTPUT CURRENT

On the internal connector clamp, connectors showing "Current Out" provide a proportional current signal shown on the display as:

$$0 \div 10,00 \text{ mg/l } Cl_2 = 0 \div 20\text{mA} ; 4 \div 20\text{mA}$$

Max external input impedance: 330 Ohm.

Instrument tag shows output current value set at the factory

The mA current signal has not galvanic isolation. Upon request galvanic isolation available.

ACCESSORY KIT

- N. 4 Dibbles ø6
- N. 4 Self threading screws 4.5x40
- N. 1 Instruction booklet
- N. 1 "Set-Point" 1 or 2 fuse (2A T 5x20)
- N. 2 Fuses for instrument and contact protection (0,3A T5x20)

LCL1 TECHNICAL CHARACTERISTICS

Power Supply : 230 Vac \pm 10%

Measuring range: 0 \div 10,00 Cl₂

Resolution: \pm 0,01 mg/l

Input Impedance: 1 kOhm

"Zero" adjustment: \pm 1 mg/l

Hysteresis set-point : \pm 0,1 mg/l

Power consumption: 3 Watt

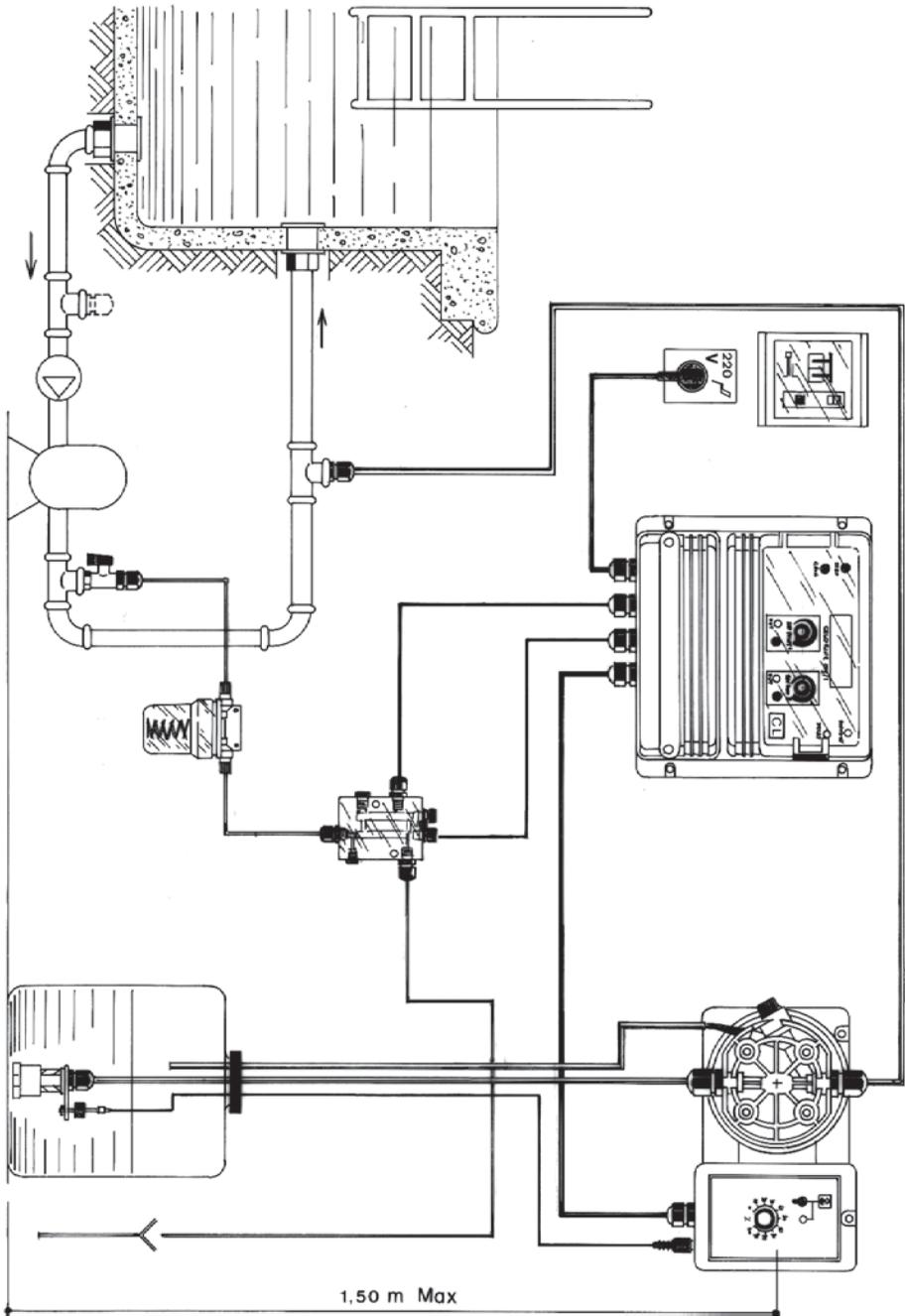
Weight: 3 Kg

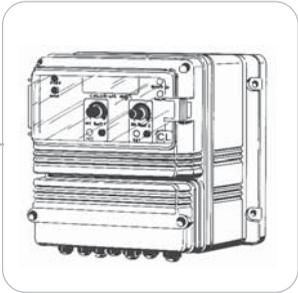
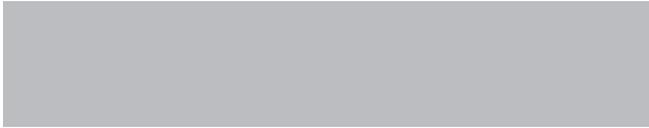
Protection rating: IP65

Environmental working temperature: 0 \div 50°C



Technical features, data sheets and drawing herein shown are subject to modifications without advice from Manufacturer.





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.