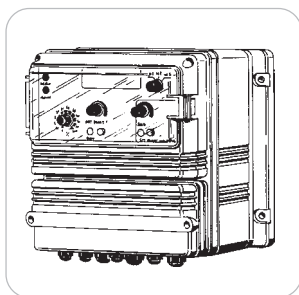




This manual contains important safety information about installation and use of this equipment. Ignoring this information could result in injuries or damages.



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



“LCD” “LCDS” “LCDRI” CONTROLLER OPERATING MANUAL

Read carefully!



ENGLISH Version

R1-11-03



“LCD” “LCDS” “LCDRI” 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 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 |
| Jumpers configuration | page 5 |
| Delay | page 5 |
| Alarm | page 5 |
| Stand-by | page 6 |
| Instrument calibration | page 6 |
| Automatic temperature compensation | page 6 |
| Set point adjustment | page 6 |
| Proportional set point adjustment | page 6 |
| Hysteresis adjustment | page 6 |
| Zero calibration | page 7 |
| Gain calibration | pag. 7 |
| Chart recorder output | page 7 |
| Technical features | page 7 |
| Panels | page 9 |

INSTRUMENT DESCRIPTION

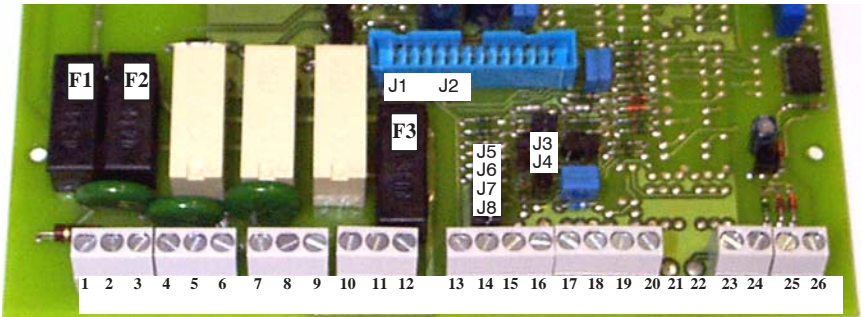
LCD series are conductivity meters for industrial control process. Three models are available for three different application modes: "LCD" model provides two ON/OFF outputs; "LCDS" proportional meter provides two ON/OFF outputs and one proportional output in mA ($0 \div 20$ or $4 \div 20$ mA, according to requirements), example Emec GIC; "LCDRI" is specifically designed to operate with cooling tower applications, provides two ON/OFF set-points with one of them offering hysteresis control ($0\% \div 30\%$). Each model of LCD series features one extra $0 \div 20$ or $4 \div 20$ mA output to connect either a chart recorder or for long distance remote control: upon request recorder output is available with galvanic protection. The 7-segments Display read out enables efficient reading even where environment does not allow easy-clear reading. The instrument is enclosed into "ABS" plastic casing rated IP 65. Casing dimensions are 215x205x130mm 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 poly-carbonate cover with climp-on lock. This instrument works only using probes with $k=1 \pm 20\%$ value. Different values must be specified.

ELECTRICAL CONNECTIONS TO "LCD" METER

All electrical connections to LCD can be carried out through the internal connector clamp placed at the front bottom of the casing: to access unscrew front bottom cover. Prior carrying out any electrical wiring operation **disconnect the instrument from power supply** and follow the points shown herein below:



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



1-2 : Power Supply 220V mains input

3-4 : 220 Vac Output Set Point 1

5-6 : 220 Vac Output Set Point 2

7-8-9 : EARTH

10-11 : N.O. (Normally Open) "Alarm" contact

11-12 : N.C. (Normally Close) "Alarm" contact

13-14-15 : connection "SEPR"* proximity switch sensor +V(13) ; Signal(14); -V(GND15)

16 : CD probe shielded cable connection

17-18 : CD probe connections

19-20 : Temperature probe

23-24 : $0 \div 20$ (or $4 \div 20$) mA proportional output +(23); -(24), available only for LCDS model

25-26 : $0 \div 20$ (or $4 \div 20$) mA output for chart recorder, +(25); -(26)

Jumpers configuration, see next page. Fuses characteristics see page 7.

JUMPERS CONFIGURATION

J1:

| | | |
|---|---|---|
| ○ | ○ | ○ |
|---|---|---|

 J1 - J2 used for temperature compensation.

J2:

| | | |
|---|---|---|
| ○ | ○ | ○ |
|---|---|---|

1 2 3

Automatic temp. compensation : J1 e J2 shorting pin 1-2.

Manual temp. compensation : J1 e J2 shorting pin 2-3.

Note: "LCDRI" does not feature manual temperature compensation.

J3:

| | | |
|---|---|---|
| ○ | ○ | ○ |
|---|---|---|

 J3 - J4 SetPoint setting

J4:

| | | |
|---|---|---|
| ○ | ○ | ○ |
|---|---|---|

1 2 3

Active output when conductivity value shown is > (HIGHER) then selected set-point.

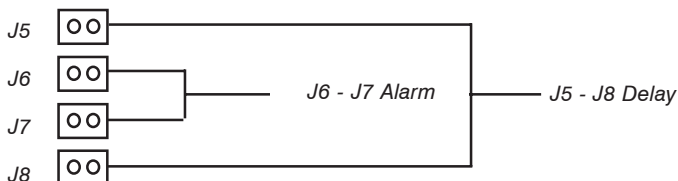
To select on SetPoint 1 (J4) insert jumper shorting pin 1-2.

To select on SetPoint 2 (J3) insert jumper shorting pin 1-2.

Active output when conductivity value shown is < (LOWER) then selected set-point.

To select on SetPoint 1 (J4) insert jumper shorting pin 2-3

To select on SetPoint 2 (J3) insert jumper shorting pin 2-3



| | | | | | |
|-------|-------|---|-------|-------|-------|
| delay | J5 | C | C | O | O |
| | J8 | C | O | C | O |
| Time | 10sec | | 15min | 30min | 60min |

| | | | | | |
|-------|----------|---|-------|-------|-------|
| alarm | J6 | C | C | O | O |
| | J7 | C | O | C | O |
| Time | Disabled | | 15min | 30min | 60min |

DELAY

Delay function is operational, according to the above table setting; when turning ON the instrument automatically deactivates all outputs allowing a correct polarization of connected CD probe. T

ALARM

This function is designed to give an alarm when the additive tank is empty or when additive concentration value into the system has not reached the required Set-point according the selected jumpers "Alarm" time period. Time counting starts when set-point front panel Led and internal output relay is ON. 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.

STAND-BY

“Stand-By” is featured upon request. The automatic “Stand-By” function is possible by means of the proximity switch “SEPR”. “Stand-By” function deactivates Set-point outputs whilst instrument measurement remains constant. When “SEPR” led is ON, outputs S.P.1-S.P.2 are deactivated “Stand-By” can also be activated also by means of a voltage free N.C. contact, utilising connectors 13-14. When contact is open, “Stand-By” front panel led is ON indicating the instrument status.

INSTRUMENT CALIBRATION

Once connections are carried out, to calibrate the instrument proceed as follow:

- 1) Select buffer solution close to the system working temperature.
- 2) Turning front panel temperature knob, select same value as buffer solution.
- 3) Deep CD probe into buffer solution, shake and after about one minute adjust GAIN on front panel with screwdriver until the display shows the buffer solution value.

LCD offers three measurement ranges:

199.9 μ S ; 1999 μ S ; 19.99 ms

The above ranges can be selected by means of turning range selector knob. Each time one range is selected, the **INSTRUMENT MUST BE CALIBRATED** utilising correspondant buffer solution.

- 4) Set workinginstrument temperature; temperature compensation is calculated at 3% per C°.

AUTOMATIC TEMPERATURE COMPENSATION

LCD and LCDS can be set to function with Automatic Temperature Compensation connecting either Emec “ETE” (temperature probe) or “ECDCC” (CD probe with temperature sensor) to instrument internal clamp connections. To activate this function position the internal jumpers as shown in previous page (not for “LCDRI” model that comes with automatic temperature compensation already activated). Temperature probe must be installed either directly to pipeline or into probe holder. When utilising automatic temperature compensation, manual temperature function is not active.

SET-POINT ADJUSTMENT

To read selected Set-Point, press the button below the knob “Set-Point”: to modify turn the knob while pressing the button below until the display shows required Set-Point. Led is lit when output relay is active.

PROPORTIONAL SET-POINT ADJUSTMENT (only for model “LCDS”)

“LCDS” proportional meter provides two ON/OFF outputs and one proportional output in mA (0÷20 or 4÷20mA, according to requirements). To read selected Set-Point, press the button below the knob “Set-Point”: to modify turn the knob while pressing the button below until the display shows required Set-Point. Led is lit when ourput relay is active.

HYSTERESIS ADJUSTMENT

“LCDRI” is specifically designed to operate with cooling tower applications, provides two ON/OFF set-points but only the first one provides hysteresis control. Hysteresis can be adjusted between 0% and 30% of selected set-point, turning the front panel knob correspondant to this function. “LCDRI” does not feature temperature compensation.

GAIN REGULATION (ONLY “LCDS” - GREY AREA)

“Gain” regulation is useful to multiply the current output of the instrument for a “1 to 20” value using the “SetPoint Proportional” graduate scale knob. However remember that maximum current output still remains 20mA. This regulation restore solution values during a time set by the “gain” knob. For best results remember that gain procedure may be different every time because of: pump’s flow capacity, used additive and type of plant.

ZERO CALIBRATION

To obtain reliable reading values from conductivity probe, it should be “zero calibrated”. To check if probe needs to be calibrated remove it from plant (or just before to install it remove the protection cap) wash it with water, dry by shaking it and put it on a table leaving it free to air. Now check if instrument shows 0,00. If not then regulate instrument’s zero, by turning the trimmer labeled “zero” on instrument’s front panel, until display will show 0,00.

CHART RECORDER OUTPUT

Internal clamp pin 23, 24 provide output proportional current 0÷20 mA (or 4÷20) to measured value shown on the display and can be utilised for a chart recorder. The output signal relates to the selected range value by the operator.

- 1) 199.9 μS = 0÷20 mA
- 2) 1999 μS = 0÷20 mA
- 3) 19,99 mS = 0÷20 mA

Max external input impedance: 330 Ohm: upon request recorder output is available with galvanic protection

TECHNICAL FEATURES

Power supply: 220 Vac \pm 10%

Measuring ranges: 0÷199,9 μS
0÷1999 μS
0÷19,99 mS

Accuracy: \pm 0,1 μS
 \pm 1 μS
 \pm 0,01mS

Hysteresis Set-Point: \pm 1 μS
 \pm 10 μS
 \pm 0,10mS

Consumption: 5W

Weight: 1Kg

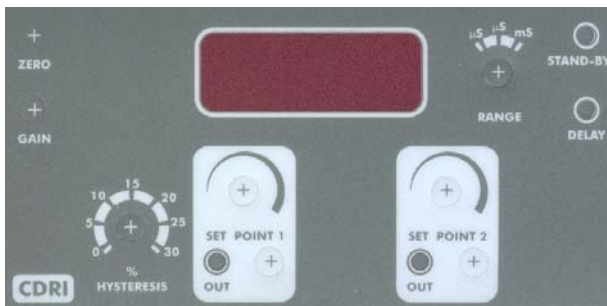
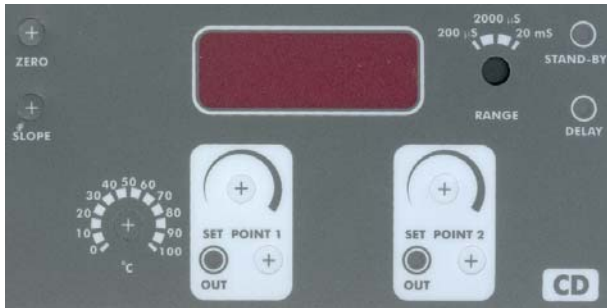
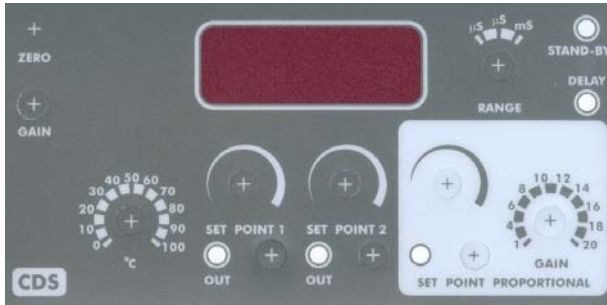
Protection rating: IP65

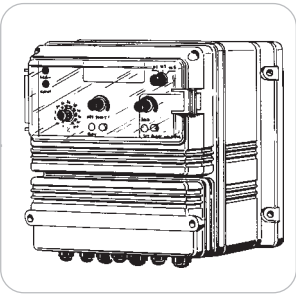
Fuses :

F1: *instrument fuse* 5x20 200mA T
F2: *setpoint outputs* 5x20 2A T
F3: *alarm relay output* 5x20 2A T

***Technical Features, Data sheets and Drawing herein shown are
subject to modifications without advice from Manufacturer.***

PANELS FOR LCD, LCDS, LCDRI INSTRUMENTS





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.