UNI EN ISO 9001:2000
CERT. N. 9115 BCEL

OPERATOR'S MANUAL

CL 3630

2 – WIRE 4/20 mA LOOP POWERED CHLORINE - D. OZONE TRANSMITTER DIN RAIL

Rev. 01

Scales: 0/1.999 0/19.99 0/199.0
Temperature: -10/+120 °C
Power: 10/30 Vdc

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1 GENERAL

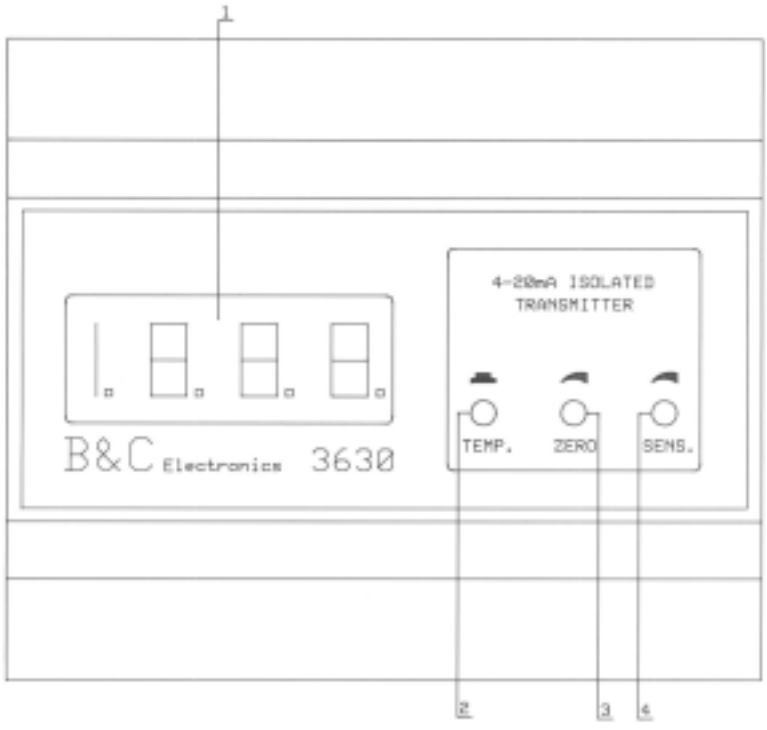
This manual applies to the CL 3630 digital 2-wire transmitter DIN RAIL housing.

It explains the purpose of the equipment, describes the components of the system and the procedures for installing, operating and calibrating the equipment.
Some maintenance suggestions are also provided.

2 FUNCTIONAL DESCRIPTION

This transmitter, provides a digital readout of the Chlorine or D. Ozone of aqueous solutions.

The transmitter will perform manual or automatic Temperature compensation to correct the readings for Temperature related variations.
Temperature information is displayed by pushing button "2" marked "TEMP".
The transmitter provides an isolated 4/20 mA output, proportional to the reading value which is suitable for data acquisition systems, recorders, controllers or other input devices that require a 4/20 mA input.
The front panel contains trimmer pots for Zero and Sensitivity adjustment. Zero is adjusted by trimmer "3" marked "zero" and Sensitivity is adjusted by trimmer "4" marked "sens".



1. DISPLAY
2. TEMPERATURE DISPLAY ACTUATOR
3. ZERO CALIBRATION
4. SLOPE CALIBRATION

Fig. 1

3 PHYSICAL DESCRIPTION

The transmitter enclosure is designed for DIN Rail mounting.

It consists of a plastic case with front panel which is coated by a polycarbonate membrane (Fig. 1), to ensure maximum anticorrosion characteristics.

For field applications mounting in a splash proof or weather resistant box is suggested.

Figure 2 describes the physical details and dimensional characteristics.

Connections to power supply, loads, recorder, RTD, electrodes and probe are installed on to the terminal block connector.

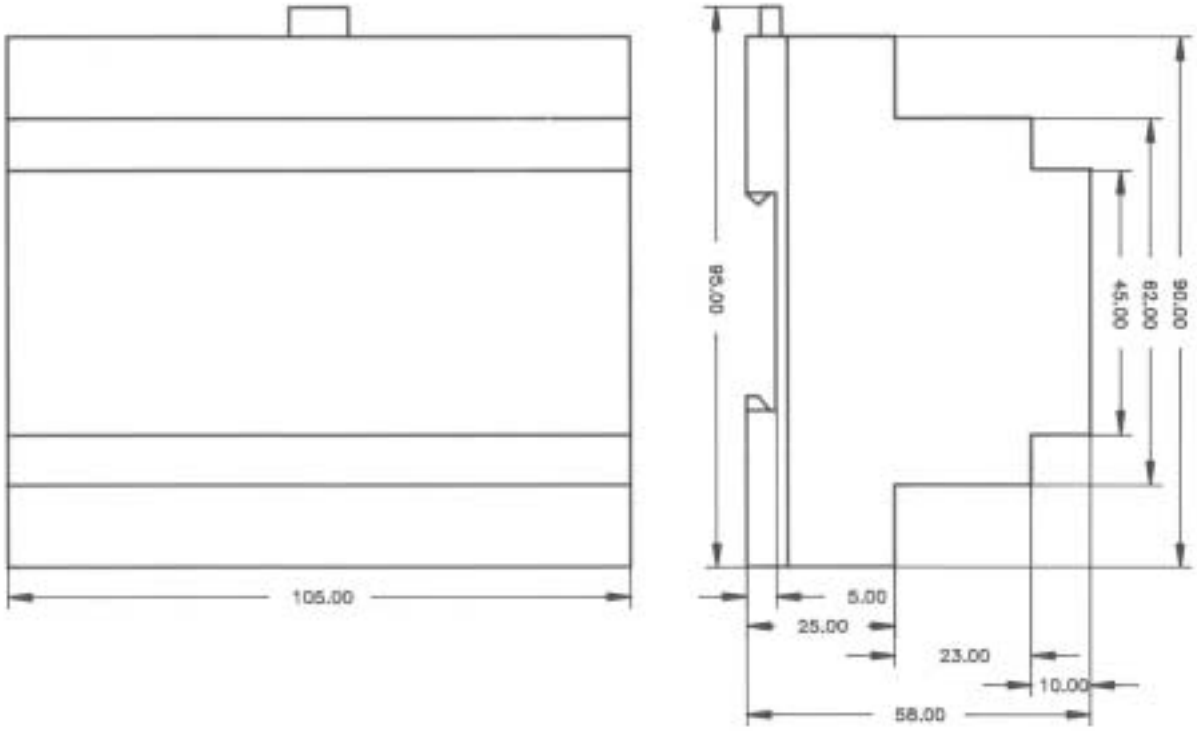


Fig. 2

4 SPECIFICATIONS

Display:	LCD
Input from:	3 wires potentiostatic 2 wires polarographic 2 wires galvanic 2 or 3 wires RTD Pt100
Polarization:	-200 mV (adj +/-800mV on request)
Output:	4/20 mA isolated
Scales:	0/1.999 0/19.99 0/1999 selectable -10.0/120.0 °C
Temp. Compensation:	manual or automatic
Temp. Comp. Coefficient:	0/4.0 %/°C adjustable
Temp. Comp. Reference:	20 °C
Zero:	adjustable +/- 15 %
Slope:	adjustable 86/112 % narrow range adjustable 20/200 % wide range
Operating Temperature:	0/50 °C
Operating Humidity:	95 % without condensation
Power supply:	10/30 Vdc
Isolation:	500 V Input to Output
Terminal block:	detachable
Net Weight:	200 g
Dimensions:	105 x 95 x 58 mm (6 modules)
Mounting:	DIN Rail mountable

Necessary accessories

SZ 283:	potentiostatic sensor
SZ 7231 or **SZ 7233:**	flow cell for SZ 283
CL 7901:	polarographic Chlorine sensor and cell
OZ 7901:	polarographic D.Ozone sensor and cell

5 PHYSICAL INSTALLATION

The transmitter must be installed into an enclosure for outdoor or indoor use and it may be located close to the measuring point or some distance away in a control area.

The transmitter's housing is designed for DIN Rail mounting.

The sensor and the flow cell must be mounted according to the specific instruction manual in order to operate accurately and efficiently.

The flow rate must be adjusted according to the specific sensor.

Keep the cable away from power wires on the overall length.

This cable must not be interrupted on overall length.
If interruption is necessary, the extension cable must be fastened to the high insulation terminal strip.

The cell's cable must be protected by a sheath and not installed near power cables.

Interrupting cables must be avoided or carried out using high insulation terminals.

6 ELECTRICAL INSTALLATION

The electrical installation consists of:

- connecting the power supply to the transmitter
- connecting the sensor to the transmitter
- connecting the Temperature sensor
- connecting the load

All connections within the transmitter are made on the terminal block.

6.1 CONNECTING THE POWER

- connect dc power " + " to terminal "1" marked " + "
- connect the terminal marked " - " to terminal " + " of the load
- connect dc power " - " to terminal " - " of the load

The unit is protected against eventual inverted connections

WARNINGS

verify the supply voltage prior to connection to the transmitter.

6.2 CONNECTING THE POTENTIOSTATIC SENSOR

The connection of the sensor SZ283 is critical for a trouble free system operation.

- use the original cable on overall length between sensor and input terminals of the transmitter.

- extension cables should be avoided. When necessary, always use only high insulation terminals.

- avoid installing cable near any power cables.

- connect the **shield** of the cable (reference electrode) to the terminal **12** marked **R**

- connect the **Black** wire (upper platinum electrode) to the terminal **10** marked **IN** (measuring electrode)

- connect the **White** wire (lower platinum band) to the terminal **13** marked **EL** (counter electrode)

6.3 CONNECTING THE POLAROGRAPHIC SENSORS

Those special sensors CL 7901 or OZ 7901 provided with the selective membrane must be connected as follow:

- connect a jumper between terminals **12-13** marked **R** and **CE**
- connect the **White** wire (cathode) to the terminal **10** marked **IN**
- connect the **Brown** wire (anode) to the terminal **12** marked **R**

6.4 CONNECTING THE GALVANIC SENSORS

Contact our sales department for the connection of those type of sensors.

6.5 CONNECTING THE TEMPERATURE SENSOR

The model CL 3630 features Automatic Temperature Compensation carried out by means of a RTD Pt100.

The Temperature sensor has to be installed in the same solution being measured, close to the Chlorine/D.Ozone measuring sensor.

ATTENTION

In order to activate the ATC function, prior to connecting the RTD between terminal "4-5-6" marked "T1-T2-T3", it is necessary to remove the jumpers from terminals "3-4" and "5-6".

These jumpers must be reinstalled when operating the transmitter in manual temperature mode.

The RTD connection as above described will also provide a digital display of temperature values.

The sample Temperature value is displayed by pushing the Key pad "2" marked "TEMP" on the front panel.
The Temperature readout will not disrupt the measuring functions of the transmitter.

6.6 CONNECTING THE LOAD

Loads must be connected in series to the power loop.
See figure 4

7 SYSTEM CHECK

Before connecting the system to the power supply:

- check that all connections are installed correctly
- check that all cables are properly fastened to prevent strain on the connections
- check that all terminal-strip connections are mechanically and electrically solid

8 OPERATING THE SYSTEM

8.1 PRE-OPERATION CHECK

The system's controls and indicators are all located on the front panel.

The transmitter LCD will be displayed to indicate that the unit is on.

Push the Key pad "2" to check the sample Temperature (if RTD is connected), or the Manual Temperature value (RTD not connected and jumpers installed).

Push the button "S1" and adjust the Temperature Coefficient value on the display by means of the trimmer "R33" marked "TC". (see Fig. 3)
(Standard value are 2.0 %/°C for the free Chlorine and 2.5 %/°C for the D.Ozone)

8.2 FULL SCALE SENSITIVITY SELECTION

This selection is necessary in order to adapt the input of the transmitter to the signal provided by the different types of sensors.

Select the full scale as per following table by the dip-switches S2 marked A and S3 marked B:

Scale Sensitivity	**Switch S2**	**Switch S3**
0,4 µA	OFF	OFF
4 µA	ON	OFF
40 µA	OFF	ON

Dip switches S4 and S5 are not active

8.3 DECIMAL POINT SELECTION

Select the decimal point as per following table by the dip-switch S6 marked 1, S7 marked 2 and S8 marked 3:

Decimal point	Switch S6	Switch S7	Switch S8
XXXX	OFF	OFF	OFF
X.XXX	ON	OFF	OFF
XX.XX	OFF	ON	OFF
XXX.X	OFF	OFF	ON

The circuit boards of the unit are pre-adjusted at the factory.
If sensors and probes have been installed correctly as previously described, the system should operate correctly requiring only the calibration.

WARNING:

Improper wiring connections which result in damage to the transmitter are not covered under warranty.

9 NORMAL OPERATION

As solution passes the installed flow cell, the display will indicate instantly the concentration value of the solution currently being measured.

9.1 MANUAL TEMPERATURE COMPENSATION

The manual Temperature compensation is available when the RTD Pt100 is not installed.

- Install the jumpers between "3-4" and "5-6".

- Push the Key pad "2" on the front panel (Fig. 1) and adjust the trimmer "R5" marked " T MAN " (Fig. 3) to indicate the desired Temperature value on the display.

9.2 ELECTRICAL CALIBRATION OF ZERO

- Disconnect the potentiostatic sensor from the terminals 10-12

  or

- disconnect the polarographic sensor from the terminals 12-13

- adjust the trimmer 3 marked zero till the readout 0.000.

9.3 CHEMICAL CALIBRATION OF THE SENSITIVYTY

The transmitter is supplied with the laboratory calibration.
After the installation the unit needs a calibration, by comparison of the readout with the value provided by a field instrument (example a photometer by DPD).

Because of the possible wide difference among signals provide by the sensor, it might be necessary to adjust the sensitivity by means the coarse trimmer R 34 located between the 2 terminal blocks.

Follow the below procedure:

- measure the PPM contents of the sample by a photometer

- adjust the display value according to the above measuring by means of the trimmer 4

- if the trimmer 4 reaches the full rotation, adjust by means of the trimmer R 34 marked SENS ADJ.

10 PREVENTIVE MAINTENANCE

10.1 TRANSMITTER

Quality components have been used to ensure a high level of reliability.
Frequency of maintenance or recalibration is variable based on each particular application.

As with any electronic device, the mechanical components, such as potentiometers and connectors, are the most probable sources of potential problems.

- check for damage of the electrolytic capacitors if the meter is exposed to temperatures above 60 °C
- check for damage in all the electronic components if the meter is subjected to excessive voltage or power surges
- check for damage of the electronic and mechanical components if the meter is dropped
- repeat the pre-operation check periodically to ensure proper operation
- check that all the connections are free from moisture and contamination such as rust and corrosion

WARNINGS

Disconnect the power supply to the monitor before performing the following procedures:

- Inspect the printed circuit boards for dirt and corrosion; clean as necessary and blow dry.

- Tighten all the terminal-board connections and mounting hardware.

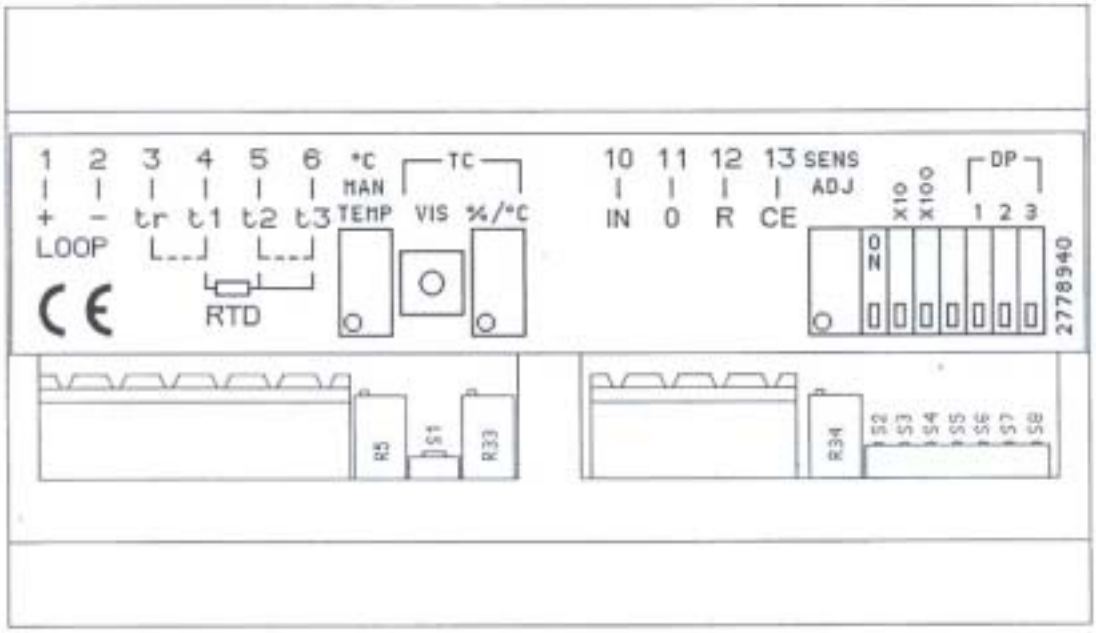
- Replace the front panel circuit board or the base circuit board.
  sensor

Coatings on the sensors surface can affect the operation. Solutions with high alkaline content or solutions which contain slurries, oils, grease etc., will require regular cleaning and inspection of the sensors measuring surface.

11 TROUBLESHOOTING GUIDE

SYMPTOMS	PROBABLE CAUSE	REMEDY
LCD not displayed meter reading	Power source problem; incorrect power wiring	Check power supply Check wiring
Display reading too high/low	Sensor failure; meter not calibrated	Clean sensor Calibrate by photometer
Display reading does not change	Sensor is damaged	Sensor replacement Check cable
Slope will not adjust	Sensor is damaged; Sensitivity not enough	Sensor replacement Check ATC sensor/jumpers

CL 3630 CONNECTIONS



1.	loop supply (+ input)
2.	loop supply (- input)
3.4.	jumper for temp. compensation
5.6.	jumper for temp. compensation
4.5.6.	Pt100 input
10.12.13.	potentiostatic sensor input
12.13.	jumper for polarographic input
10.12.	polarographic sensor input
10.11.	galvanic sensor input
R5	manual temperature control
R33	temperature coefficient control
R34	coarse sensitivity adjustment
S1	switch to visualize the temperature coefficient
S2.S3	switches for sensitivity selection
S4.S5	switches not active
S6	switch to light the decimal point X.XXX
S7	switch to light the decimal point XX.XX
S8	switch to light the decimal point XXX.X

Fig. 3

CONNECTIONS EXAMPLES

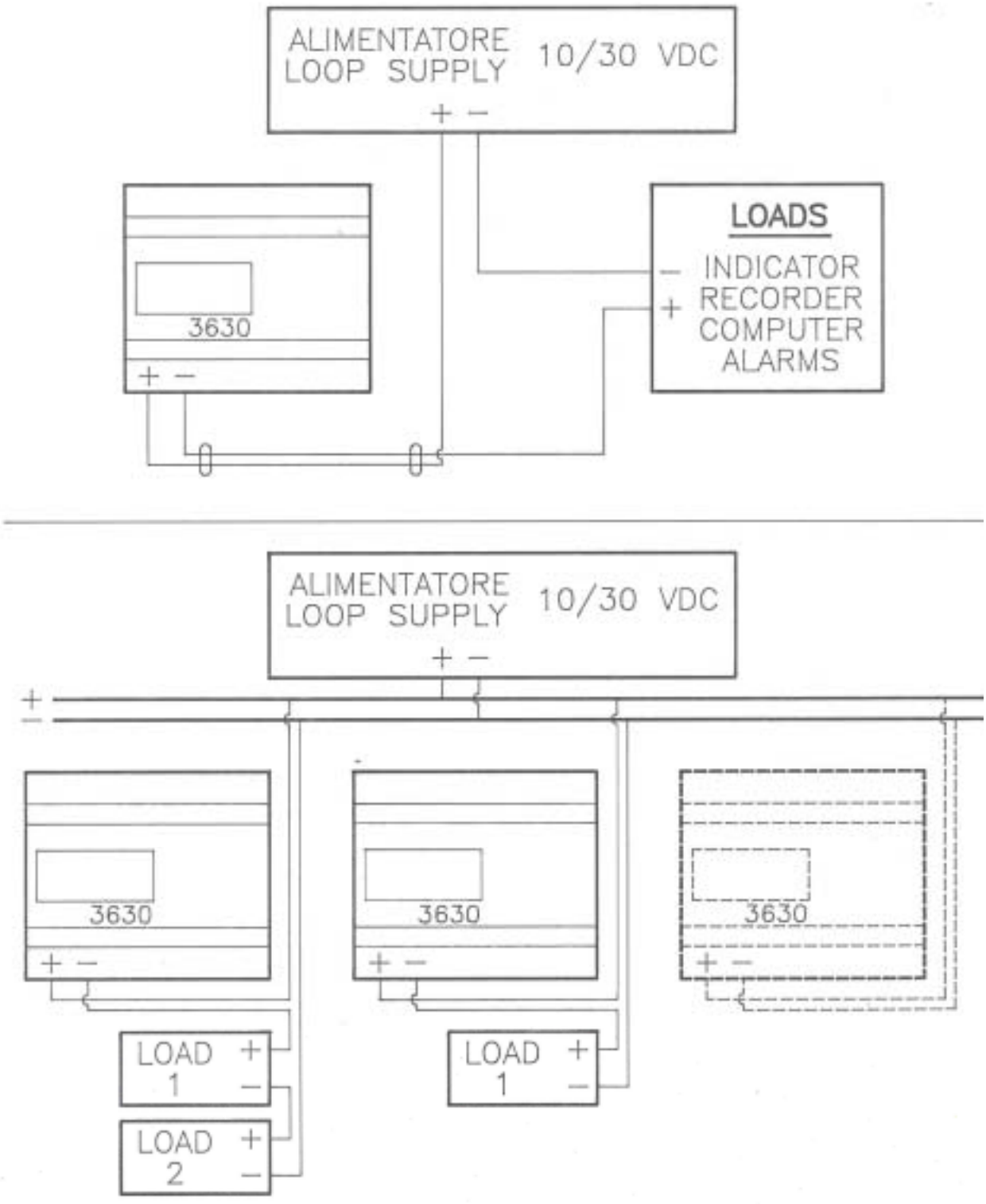


Fig. 4

N O T E

N O T E