

OPERATOR'S MANUAL

MV 3630
2-WIRE O.R.P. TRANSMITTER
DIN RAIL

Rev. A - Valid from S/N 56972

Scale: 0/1000 mV

Power supply: 10/30 Vdc

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1 GENERAL

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

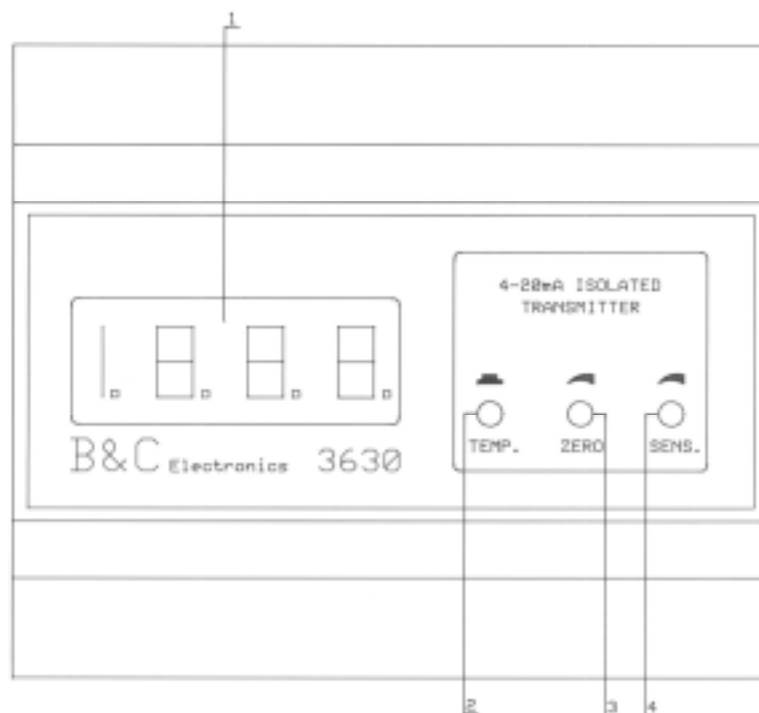
It explains the purpose of the equipment, describes the components of the system and the procedures for installing, operating and calibrating the equipment. Some maintenance suggestions are also provided.

2 FUNCTIONAL DESCRIPTION

This transmitter, when connected to the ORP electrode, provides a digital readout of the ORP of aqueous solutions.

The transmitter provides an isolated 4/20 mA output, proportional to the pH 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 Slope adjustments. "Zero" is adjusted with trimmer "3" and "Slope" is adjusted with trimmer "4" (Fig. 1).

The unit is protected against power supply inversion.



1. DISPLAY LCD
2. UNUSED
3. ZERO CALIBRATION
4. SENSITIVITY 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 the mounting in a splash proof or weather resistant box are suggested.

Figure 2 describes the physical details and dimensional characteristics.

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

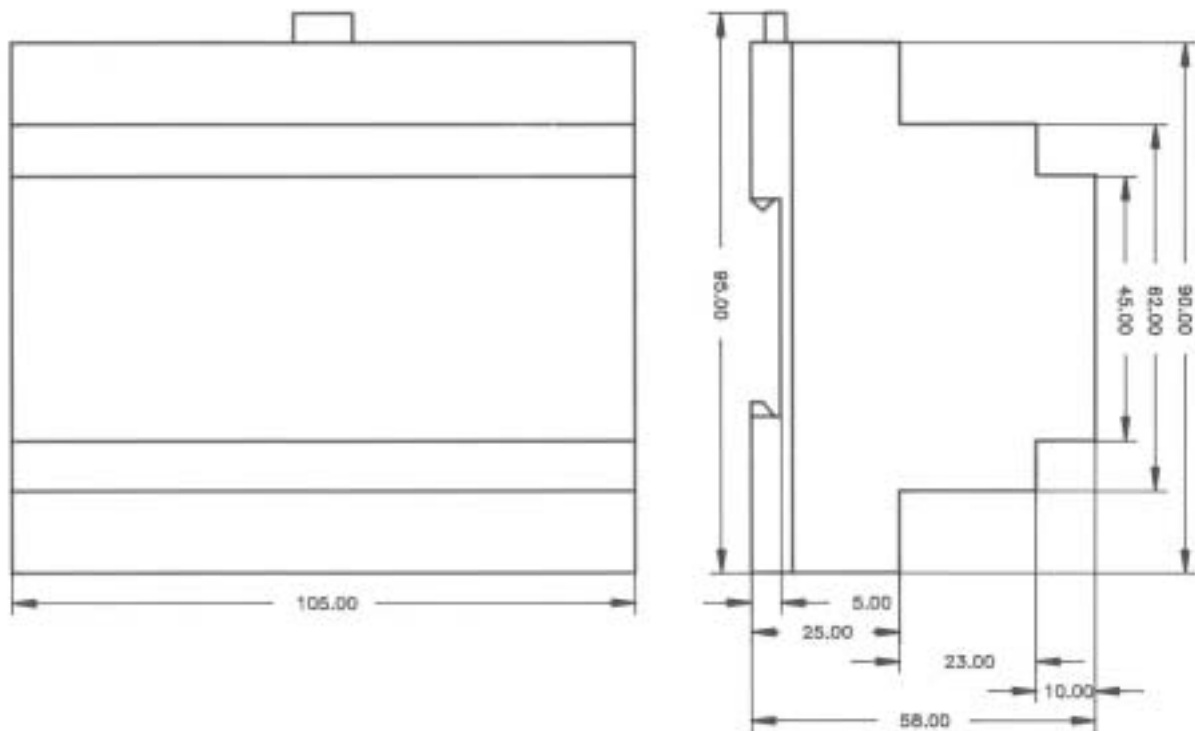


Fig. 2

4 SPECIFICATIONS

| | |
|------------------------|------------------------------|
| Display: | LCD |
| Input: | ORP electrode |
| Output: | 4/20 mA dc isolated |
| Scales: | 0/1000 mV |
| Zero: | adjustable $\pm 15\%$ |
| Sensitivity (Span): | adjustable 86/112% |
| Input Current: | $< 2 \text{ pA}$ |
| Input Resistance: | $> 10^{12} \Omega$ |
| 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 |

5 PHYSICAL INSTALLATION

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

To ensure best operational performance, it is suggested that the transmitter be located within 30 feet of the electrode, and long cable runs be made with conventional coaxial electrode cable.

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

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

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

When installing "in line" electrodes it is suggested to follow the specific instructions given by the sensor's manufacturer.

6 ELECTRICAL INSTALLATION

The electrical installation consists of:
(see Fig. 3)

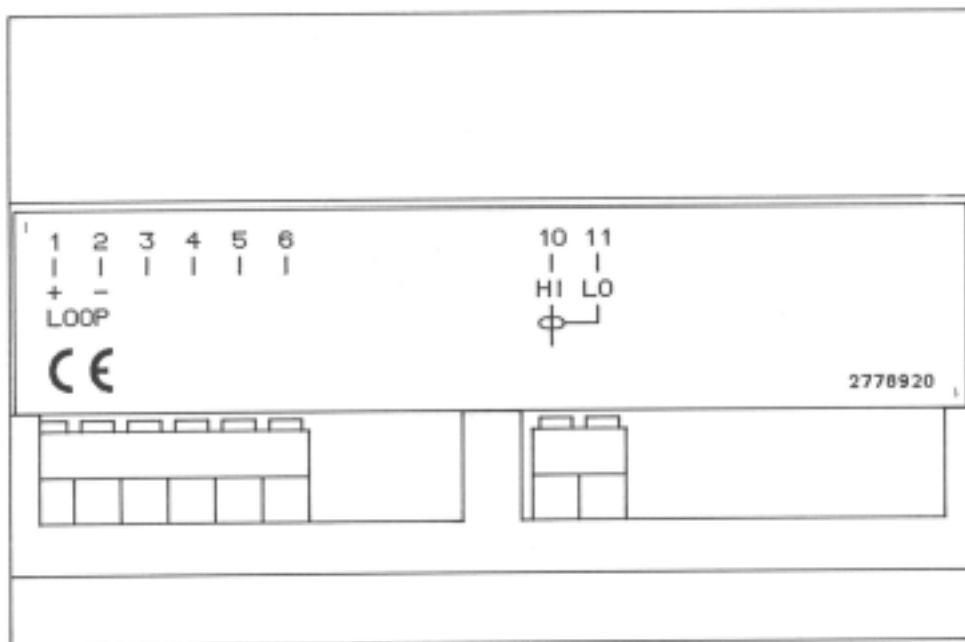
1. connecting the power supply to the transmitter
2. connecting the electrode or the probe to the transmitter

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



1. LOOP SUPPLY (+)
2. LOOP SUPPLY (-) Loop supply (-)
10. ELECTRODE (Platinum)
11. ELECTRODE (Reference)

Fig. 3

WARNINGS

Verify the supply voltage prior to connection to the transmitter.

6.2 CONNECTING THE ELECTRODE (PROBE)

- terminal "10" marked "HI"
Connect the center conductor (Platinum electrode)
- terminal "11" marked "LO".
Connect the Shield of the coax cable (Reference electrode)

Electrode cabling is a critical component for trouble free system operation.

- use a low noise coax cable on overall length between sensor and input terminals of the transmitter
- low noise cable has, in general, a black conductive layer between the center conductor and the shield. Be sure this layer is removed
- extension cables should be avoided. When necessary, always use only high insulation terminals
- avoid installing cable near any power cables

7 OPERATING THE SYSTEM

7.1 PRE-OPERATION 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.

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.

The circuit boards of the unit are pre-adjusted at the factory.

If sensor has been installed correctly as previously described, the system should operate correctly requiring only electrode calibration.

WARNING

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

7.2 CALIBRATION

7.2.1 ELECTRICAL CALIBRATION

The following procedures can be used to verify that the ORP transmitter is operating satisfactorily, and it can be repeated periodically to check that the transmitter is maintaining electrical calibration:

- connect a mV Simulator to terminals "10-11" marked " HI - LO "
- simulate mV values over the entire scale
- adjust "Zero" and "Slope" with trimmers located on the front panel
- check the input insulation following the instructions of the Simulator.
Input Current must be lower than 2 pA.

7.2.2 CALIBRATING WITH BUFFER SOLUTIONS

ORP Instrumentation manufactured by B&C Electronics are laboratory calibrated and verified using a standard mV generator.

Before using the electrode or calibrating, check that the electrode has been stored wet.

If the protective cap is empty and the electrode is dry, immerse the electrode in a buffer solution or tap water (do not use distilled water) for three hours before operating.

See general instructions provided by the electrode manufacturer for further details.

- Immerse the electrode in the buffer solution SZ 961 (220 mV) and adjust the trimmer marked "zero".
- Immerse the electrode in the buffer solution SZ 962 (420 mV) and adjust trimmer marked "sens".

Check the calibration periodically.

8 MAINTENANCE

8.1 TRANSMITTER

Quality components have been used to ensure a high level of reliability.

Frequency of maintenance or re-calibration 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.

WARNING

Disconnect the power supply to the transmitter 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.

8.2 SENSOR

Coatings on the Platinum measuring surface can affect operation.

Solutions which are high in alkaline content (above 10 pH) and or solutions which contain slurries, oils, grease, etc., will require regular cleaning and inspection of the electrode's glass measuring surface.

Suggested methods for cleaning the electrode include chemical cleaning (except hydrofluoric acid) and non abrasive detergent washing.

9 TROUBLESHOOTING GUIDE

| Symptoms | Probable cause | Remedy |
|---------------------------------|--|---|
| LCD not displayed | power source problem incorrect power wiring | check power supply check wiring |
| Display reading too high/low | electrode failure; meter uncalibrated | clean electrode calibrate with buffers |
| Display reading does not change | electrode damage; short circuit | electrode replacement check cable |
| Slope will not adjust | electrode damage; | electrode replacement |

NOTE

NOTE