Instruction Manual

BL982411-0
BL982411-1

Panel-Mounted ORP Indicators & Controllers

Black Stone

WARRANTY

These instruments are guaranteed for two years against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. Electrodes and probes are guaranteed for six months. This warranty is limited to repair or replacement free of charge.

Damages due to accidents, misuse, tampering or lack of prescribed maintenance are not covered.

If service is required, contact your local Hanna Instruments Office. If under warranty, report the model number, date of purchase, serial number and the nature of the problem. If the repair is not covered by the warranty, you will be notified of the charges incurred. If the instrument is to be returned to Hanna Instruments, first obtain a Returned Goods Authorization number from the Technical Service department and then send it with shipping costs prepaid. When shipping any instrument, make sure it is properly packaged for complete protection.

Recommendations for Users
Before using these products, make sure that they are entirely suitable for the environment in which they are used. Operation of these instruments in residential areas could cause unacceptable interferences to radio and TV equipment. Avoid touching the electrode sensor at all times. During operation, ESD wrist straps should be worn to avoid possible damage to the electrode by electrostatic discharges. Any variation introduced by the user to the supplied equipment may degrade the instrument's EMC performance. To avoid electrical shock, do not use these instruments when voltages at the measurement surface exceed 24 Vac or 60 Vdc. To avoid damages or burns, do not perform any measurement in microwave ovens.

Dear Customer,

Thank you for choosing a Hanna Instruments product.

Please read this instruction manual carefully before using these instruments. This manual will provide you with the necessary information for correct use of these instruments.

If you need additional technical information, do not hesitate to e-mail us at tech@hannainst.com or view our worldwide contact list at www.hannainst.com.

PRELIMINARY EXAMINATION

Remove the instrument from the packing material and examine it carefully to make sure that no damage has occurred during shipping. If there is any damage, please contact your local Hanna Instruments Office.

Each meter is supplied with:
• Mounting brackets
• Instruction manual

Note: Save all packing material until you are sure that the instrument functions correctly. All defective items must be returned in the original packing with the supplied accessories.

GENERAL DESCRIPTION

BL982411-0 and **BL982411-1** are panel-mounted ORP indicators and controllers designed for simplicity of use in a wide range of industrial applications.

Connections and wiring to electrode, power supply and contacts are made via the terminal blocks on the rear panel. The meters are equipped with a BNC socket and accept input from conventional ORP electrodes.

Other features include: overtime control system, selection of dosing direction (Rdx/Oxd), one dosing contact, multi-colour LED for indicating if the meter is in measurement/dosing/alarm condition, possibility to set (Off-Auto-On switch) dosing action mode.

Two models are available:
• **BL982411-0** powered at 12 Vdc
• **BL982411-1** powered at 115 or 230 Vac

SPECIFICATIONS

Range	0 to 1000 mV
Resolution	1 mV
Accuracy (@25 °C / 77 °F)	±5 mV
Calibration	Manual, through CAL trimmer
Dosing Contact	Maximum 2A (fuse protected), 250 Vac, 30 Vdc
Dosing Selection	Rdx or Oxd, selectable on the back panel Contact Open＝Reductant dosage＝Relay ON if Measure＞Setpoint Contact Close＝Oxidant dosage＝Relay ON if Measure＜Setpoint
Setpoint	Adjustable, from 0 to 1000 mV
Overtime	Adjustable, typically from 5 to approx. 30 minutes
Power Consumption	10 VA
Installation Category	II
Power Supply: BL932700-0 BL932700-1	External (fuse protected) 12 Vdc 115/230 Vac; 50/60 Hz
Dimensions	83 x 53 x 99 mm (3.3 x 2.1 x 3.9")

ASSEMBLING VIEW

Mounting bracket
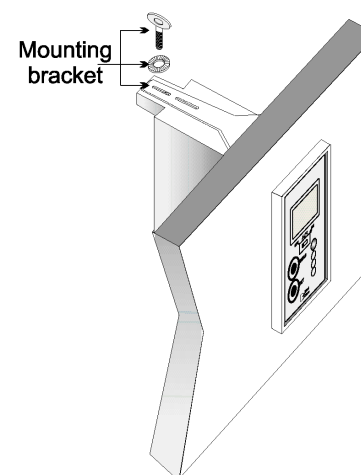
ACCESSORIES

ORP Solutions

HI7021M/L	ORP test solution (240 mV), 230/500 mL
HI7022M/L	ORP test solution (470 mV), 230/500 mL
HI7091M/L	Pretreatment Reducing Solution, 230/500 mL
HI7092M/L	Pretreatment Oxidizing Solution, 230/500 mL

Other Solutions

HI70300M/L	Electrode storage solution, 230/500 mL bottle
HI7061M/L	Electrode cleaning solution for general purposes, 230/500 mL bottle

ORP Electrodes

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HI3214P/2	BNC-type, platinum, double-junction, plastic-body with 2m (6.6') cable
HI2003/5	Heavy-duty, BNC-type, platinum, double junction, plastic-body with 5m (16.5') cable
HI2012/5	Heavy-duty, BNC-type, platinum, double junction, plastic-body with 5m (16.5') cable

Extension Cables for Screw-Type Electrodes, Screw to BNC Connector

HI7855/5	Extension cable 5 m (16.5') long
HI7855/10	Extension cable 10 m (33') long

**Other Accessories**

BLPUMPS	Dosing Pumps with flow rate from 1.5 to 20 LPH
HI6050	Submersible electrode holder, 60 cm (24")
HI6051	Submersible electrode holder, 110 cm (43")
HI6054B	Electrode holder for in-line applications
HI6054T	Electrode holder for in-line applications
HI710005	12 Vdc power adapter, US plug
HI710006	12 Vdc power adapter, European plug
HI710012	12 Vdc power adapter, Australian plug
HI710013	12 Vdc power adapter, South-African plug
HI710014	12 Vdc power adapter, UK plug
HI731326	Calibration screwdriver (20 pcs.)
HI740146	Mounting brackets
HI7871	Level Controller (min and max)
HI7873	Level Controller (min, max and overflow)

Front panel
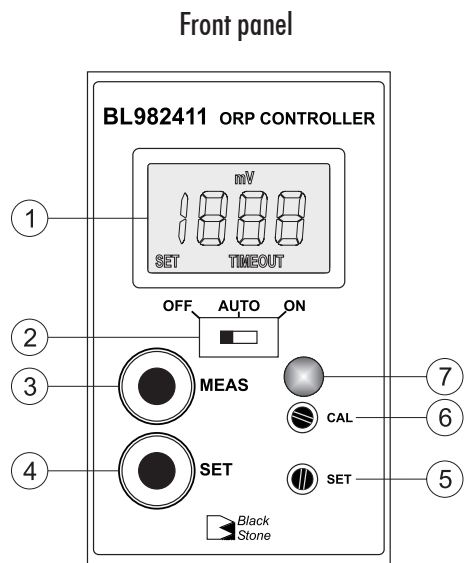
1. Liquid Crystal Display

2. Switch for selecting dosing mode:
   - **OFF** = dosing disabled
   - **Auto** = automatic dosage, depending on setpoint value and dosing selection
   - **ON** = dosing always active

3. **MEAS** key to set the instrument to measurement mode

4. **SET** key to display and set the setpoint value

5. **SET** trimmer to adjust the setpoint value (0 to 1000 mV)

6. **CAL** trimmer

7. 3-colour LED indicator:
   - **Green** = meter in measurement mode
   - **Orange/Yellow** = dosing in progress
   - **Red, blinking** = indicates an alarm condition

Rear panel
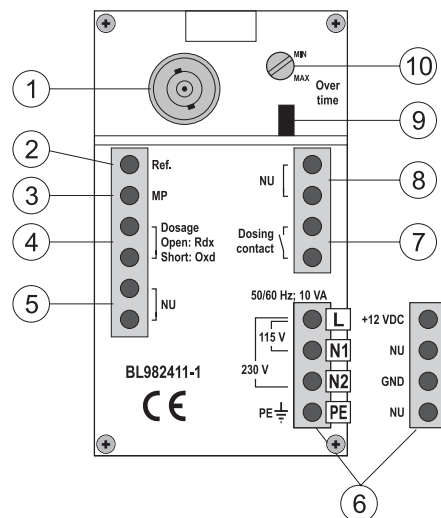
1. BNC plug for ORP electrode
2. Connection for electrode reference
3. Connection for potential Matching Pin
4. Rdx/Oxd dosage selection terminal:
   - contact open = reductant selection
   - contact closed = oxidant selection
5. Not Used contact
6. Power supply terminal:
   - for **BL982411-0** model: 12 Vdc adapter
   - for **BL982411-1** model: 115 Vac or 230 Vac option
7. This contact acts as a switch for driving the dosing system (e.g. dosing pump)
8. Not Used contact
9. Jumper for enabling (jumper in) or disabling (jumper removed) the overtime control
10. Trimmer for overtime setting (typically from 5 to 30 minutes)

⚠ All external cables connected to the rear panel should end with cable lugs.

⚠ **A circuit breaker (rated 6A max.) must be connected in close proximity to the equipment, and in a position easy to reach by the operator, for disconnection of the instrument and of all the devices connected to the relays.**

REAR PANEL CONNECTIONS
Terminals #1, #2 and #3: Electrode
- Connect an ORP electrode to the meter's BNC plug (#1).
- To benefit from the differential input, connect the proper electrode wire (if available) or a cable with a potential matching pin (grounding bar) to the relevant terminal (#3) on the rear panel.

Note: When the Matching Pin can not be immersed together with the electrode in the solution, disable the differential input by shorting terminals #3 (Matching Pin) and #2 (Electrode Reference) with a jumper wire.

Terminals #4: Dosing selection
- For Rdx dosage, leave the circuit open.
- For Oxd dosage, short the terminals with a jumper wire.

Terminals #5: Not Used

Terminals #6: Power Supply
- Model **BL982411-0:** connect the 2 wires of a 12 Vdc power adapter to the terminals +12 Vdc and GND.
- Model **BL982411-1:** connect a 3-wire power cable to the terminals while paying attention to the correct earth (PE), line (L) and neutral (N1 for 115 V or N2 for 230 V) contacts.

Terminals #7: Dosing Contact
- This contact drives the dosing system according to the selected setpoint and dosing direction:
  - if "Rdx" dosage is set, the relay is ON and dosing is activated if measured value is higher than setpoint;
  - if "Oxd" dosage is set, the relay is ON and dosing is activated if measured value is lower than setpoint.

Note: The setpoint has a typical hysteresis value comparable to the meter's accuracy.

Terminals #8: Not Used

Overtime system: jumper (#9) and trimmer (#10)
- This system allows the user to set a maximum dosing period, by adjusting the rear trimmer from 5 (min) to approx. 30 (max) minutes.
- When the set time is exceeded, any dosing action stops, the LED indicator on the front panel will blink Red and the LCD will show the "**TIMEOUT**" warning message. To exit the overtime condition, set the **OFF/Auto/ON** switch to **OFF** position, and then to **Auto** again.

- For disabling the overtime feature, simply remove the jumper from the rear panel.

Note: The overtime system works only if the **OFF/Auto/ON** switch is in **Auto** position.

OPERATING THE METER
Before proceeding make sure that:
- the setpoint value has been properly adjusted;
- all rear panel wiring and selections are correct;
- the **OFF/Auto/ON** switch is in the desired position.

Install or immerse the electrode in the solution to be monitored, then press the **MEAS** key (if necessary).

The LCD will show the ORP (mV) value. The LED indicator will light up Green when the meter is in measurement mode and dosing is not active, while it will light up Orange/Yellow for signaling that a dosing action is in progress.

CALIBRATION
This meter is factory calibrated. Anyway, it is possible to check the calibration as follows:
- ensure the meter is in measurement mode;
- immerse electrode and Matching Pin (if used) in one of the available ORP test solutions (see "Accessories");
- shake briefly and wait for reading to stabilize;
- if necessary, adjust reading through the **CAL** trimmer.

SETPOINT
Press the **SET** key: the display will show the default or previously adjusted value, together with the "**SET**" indication. Using a small screwdriver adjust the **SET** trimmer until the desired setpoint value is displayed.

After 1 minute the meter automatically returns to the normal mode; if not, press the **MEAS** key.