

## Instruction Manual

**BL 932700-0**  
**BL 932700-1**

## Panel-Mounted ORP Indicators & Controllers



### WARRANTY

These instruments are warranted for two years against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. Probes are warranted for six months. This warranty is limited to repair or replacement free of charge. Damages due to accident, misuse, tampering or lack of prescribed maintenance are not covered. If service is required, contact the dealer from whom you purchased the instrument. If under warranty, report the model number, date of purchase, serial number and the nature of the failure. 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 Customer Service department and then send it with shipment 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 product.

This manual will provide you with the necessary information for the correct operation of the meter. Please read it carefully before using the instrument.

If you need additional technical information, do not hesitate to e-mail us at [tech@hannainst.com](mailto:tech@hannainst.com).

These instruments are in compliance with the **CE** directives.

### PRELIMINARY EXAMINATION

Remove the instrument from the packing material and examine it carefully. If any damage has occurred during shipment, immediately notify your Dealer or the nearest Hanna Customer Service Center.

Each meter is supplied with:

- Mounting brackets
- Instruction manual

Note: Conserve all packing material until the instrument has been observed to function correctly. Any defective item must be returned in its original packing.

### GENERAL DESCRIPTION

**BL932700-0** and **BL932700-1** 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, contacts and external recorders 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: 4-20 mA output, overtime control system, selection of dosing direction (Rdx/Oxd), contact for external control and disabling of dosing action, multi-colour LED for indicating if the meter is in measurement/dosing/alarm condition, possibility to set (Off-Auto-On switch) dosing action mode.

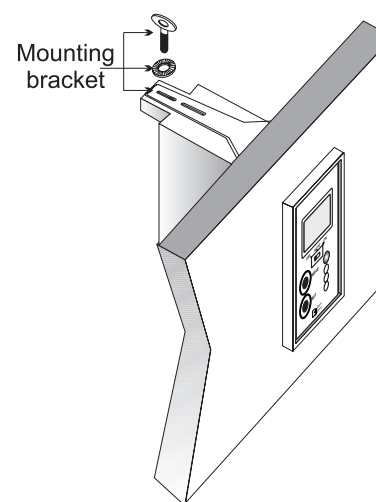
Two models are available:

- **BL 932700-0** powered at 12 Vdc
- **BL 932700-1** powered at 115 or 230 Vac

### SPECIFICATIONS

Range	±1000 mV
Resolution	1 mV
Accuracy (@ 20°C/68°F)	±5 mV
Typical EMC Deviation	±5 mV / ±0.10 mA
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 -1000 to 1000 mV
Overtime	Adjustable, typically from 5 to approx. 30 minutes
Recorder Output	4 to 20 mA, accuracy ±0.20 mA, 500 Ω maximum load
Power Consumption	10 VA
Installation Category	II
Power supply:	External (fuse protected)
BL932700-0	12 Vdc
BL932700-1	115/230 Vac ; 50/60Hz
Dimensions	83 x 53 x 99 mm (3.3x2.1x3.9")

### ASSEMBLING VIEW



### ACCESSORIES

#### ORP SOLUTIONS

HI 7020M/L	ORP test solution (200-275 mV), 230/500 mL
HI 7021M/L	ORP test solution (240 mV), 230/500 mL
HI 7022M/L	ORP test solution (470 mV), 230/500 mL
HI 7091M/L	Pretreatment Reducing Solution, 230/500 mL
HI 7092M/L	Pretreatment Oxidizing Solution, 230/500 mL

#### OTHER SOLUTIONS

HI 70300M/L	Electrode storage solution, 230/500 mL bottle
HI 7061M/L	Electrode cleaning solution for general purposes, 230/500 mL bottle

#### ORP ELECTRODES

HI 3214P/2	BNC-type, platinum, double-junction, plastic-body with 2m (6.6') cable
HI 2003/5	Heavy-duty, BNC-type, platinum, double junction, plastic-body with 5m (16.5') cable
HI 2012/5	Heavy-duty, BNC-type, platinum, double junction, plastic-body with 5m (16.5') cable

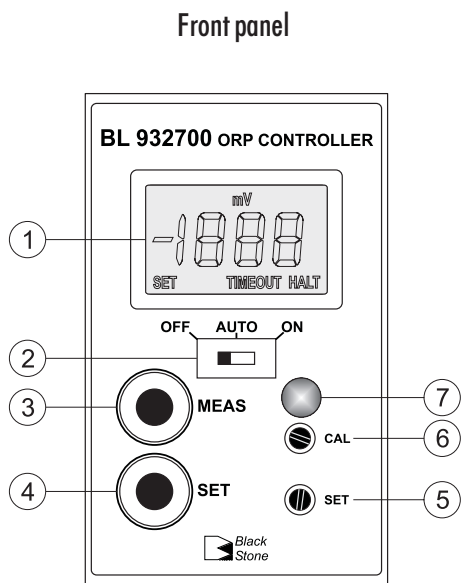
#### EXTENSION CABLES FOR SCREW-TYPE ELECTRODES, SCREW TO BNC CONNECTOR

HI 7855/5	Extension cable 5 m (16.5') long
HI 7855/10	Extension cable 10 m (33') long

#### OTHER ACCESSORIES

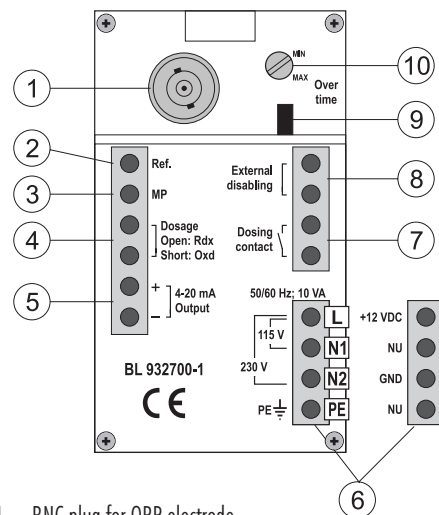
BL PUMPS	Dosing Pumps with flow rate from 1.5 to 20LPH
HI 6050	Submersible electrode holder, 60 cm (24")
HI 6051	Submersible electrode holder, 110 cm (43")
HI 6054B	Electrode holder for in-line applications
HI 6054T	Electrode holder for in-line applications
HI 710005	12 Vdc power adapter, US plug
HI 710006	12 Vdc power adapter, European plug
HI 710012	12 Vdc power adapter, Australian plug
HI 710013	12 Vdc power adapter, South-African plug
HI 710014	12 Vdc power adapter, UK plug
HI 731326	Calibration screwdriver (20 pcs)
HI 740146	Mounting brackets
HI 7871	Level Controller (min and max)
HI 7873	Level Controller (min, max and overflow)

## FUNCTIONAL DESCRIPTION



1. Liquid Crystal Display
2. Switch for selecting dosing mode:
  - OFF = dosing disabled
  - Auto = automatic dosing, 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 (within  $\pm 1000\text{mV}$ )
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. 4-20 mA output terminal for recorder connection
6. Power supply terminal:
  - for BL932700-0 model: 12 Vdc adapter
  - for BL932700-1 model: 115 Vac or 230 Vac option
7. This contact acts as a switch for driving the dosing system (e.g. dosing pump)
8. External control and disabling of dosing system
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.

## OPERATIONS

### REAR PANEL CONNECTIONS

#### Terminals #1, #2 and #3: Electrode

- Connect an ORP electrode to the meter 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: 4-20 mA Output

- These output terminals are used for connecting a recorder. The output is from 4 to 20 mA and is proportional to the measured ORP value.

#### Terminals #6: Power Supply

- Model BL932700-0: connect the 2 wires of a 12 Vdc power adapter to the terminals +12 Vdc and GND.
- Model BL932700-1: 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, accordingly to the selected setpoint and dosing direction:
  - if "Rdx" dosage is set, the relay is ON and dosing activated if measured value is higher than setpoint;
  - if "Oxd" dosage is set, the relay is ON and dosing activated if measured value is lower than setpoint.

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

#### Terminals #8: External Disabling Contact

- This is a normally open contact and can be used for example for connecting a level controller.
- When the contact is closed, any dosing action stops, the LED indicator on the front panel will blink Red and the LCD will show the "HALT" warning message.

**Note:** If the OFF/Auto/ON switch is in ON position, the dosing action will not stop, even if the external disabling contact is closed. Dosage will proceed, the LED

indicator will lit Orange/Yellow and the LCD will show the "HALT" warning message.

#### 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 on 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 Auto/OFF/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 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; or press the "MEAS" key.