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 techserv@hannacan.com. These instruments are in compliance with the CE directives.

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**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.

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**GENERAL DESCRIPTION**

BL931700-0 and BL931700-1 are panel-mounted pH 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 pH electrodes.

Other features include: 4–20 mA output, overtime control, selection of dosing direction (Acid/Alk), 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 931700-0 powered at 12 Vdc
- BL 931700-1 powered at 115 or 230 Vac

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**ACCESSORIES**

**OTHER SOLUTIONS**

- HI 70300M/L Electrode storage solution, 230/500 ml bottle
- HI 7061M/L Electrode general cleaning solution, 230/500 ml bottle
- HI 7073M/L Protein cleaning solution, 230/500 ml bottle
- HI 7074M/L Inorganic cleaning solution, 230/500 ml bottle
- HI 7077M/L Oil & Fat cleaning solution, 230/500 ml bottle

**REFILLING ELECTROLYTE SOLUTIONS**

- HI 7007M/L pH 7.01 buffer solution, 230/500 ml bottle
- HI 7006M/L pH 6.86 buffer solution, 230/500 ml bottle
- HI 7005M/L pH 4.01 buffer solution, 230/500 ml bottle
- HI 7009M/L pH 9.18 buffer solution, 230/500 ml bottle
- HI 7010M/L pH 10.01 buffer solution, 230/500 ml bottle

**OTHER ACCESSORIES**

- BL 6050 Submersible electrode holder, 60 cm (24")
- HI 6051 Submersible electrode holder, 110 cm (43")
- HI 6054 Submersible electrode holder, 230 cm (90")
- HI 6054B Electrode holder for in-line applications
- HI 6054T Electrode holder for in-line applications
- HI 71005/6 12 Vdc power adapter, US/European plug
- HI 731326 Calibration screwdriver (20 pcs.)
- HI 740146 Mounting brackets
- HI 7781 Level Controller (min and max)
- HI 7783 Level Controller (max, min and max)

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**SPECIFICATIONS**

- **Range**: 0.00 to 14.00 pH
- **Resolution**: 0.01 pH
- **Accuracy** (at 20°C/68°F): ±0.02 pH
- **Typical EMC Deviation**: ±0.10 pH / ±0.10 mA
- **Dosing Contact**: Maximum 2A (fuse protected), 250 Vac, 30 Vdc
- **Dosing Selection**: Acid or Alk, selectable on the back panel
- **Contact Open**: Acid dosage = Relay ON if Measure > Setpoint
- **Contact Close**: Alk dosage = Relay ON if Measure < Setpoint
- **Setpoint**: Adjustable, from 0 to 14 pH
- **Overtime**: Adjustable, 5 to approx. 30 minutes
- **Power Consumption**: 10 VA
- **Power Supply**: External (fuse protected)
- **Power Supply**: BL931700-0 12 Vdc
- **Power Supply**: BL931700-1 115/230 Vdc, 50/60Hz
- **Dimensions**: 83 x 53 x 99 mm (3.3x2.1x3.9")

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**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.

**Black Stone**

Before using these products, make sure that they are entirely suitable for the environment in which they are used. These instruments are designed for use in controlled environments and are not suitable for use in hazardous or dangerous environments. Before using these instruments, it is recommended to consult the relevant guidelines and recommendations issued by the appropriate authorities.

**Recommendations for Users**

- **Electrode holder for in-line applications**: HI 6054B
- **Submersible electrode holder, 110 cm (43")**: HI 7010M/L
- **12 Vdc power adapter, US/European plug**: HI 7009M/L
- **HI 7011S pH 4.01 buffer solution, 230/500 ml bottle**
- **HI 7006M/L pH 6.86 buffer solution, 230/500 ml bottle**
- **HI 7005M/L pH 4.01 buffer solution, 230/500 ml bottle**
- **HI 7009M/L pH 9.18 buffer solution, 230/500 ml bottle**
- **HI 7010M/L pH 10.01 buffer solution, 230/500 ml bottle**
- **HI 7011S pH 4.01 buffer solution, 230/500 ml bottle**
- **HI 7006M/L pH 6.86 buffer solution, 230/500 ml bottle**
- **HI 7005M/L pH 4.01 buffer solution, 230/500 ml bottle**
- **HI 7009M/L pH 9.18 buffer solution, 230/500 ml bottle**
- **HI 7010M/L pH 10.01 buffer solution, 230/500 ml bottle**
- **HI 7781 Level Controller (min and max)**
- **HI 7783 Level Controller (max, min and max)**

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Dear Customer,
FUNCTIONAL DESCRIPTION

REAR PANEL CONNECTIONS

1. BNC plug for pH electrode
2. Connection for electrode reference
3. Connection for potential Matching Pin
4. Acid/Alkaline dosage selection terminal:
   • contact open = acid selection
   • contact closed = alkaline selection
5. 4-20 mA output terminal for recorder connection
6. Power supply terminal:
   • for BL931700-0: model 12 Vdc adapter
   • for BL931700-1: 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. Jammer for enabling (jammer in) or disabling (jammer removed) the overtime control
10. Trimmer for overtime setting (typically from 5 to 30 minutes)

OPERATIONS

REAR PANEL CONNECTIONS

Termsinals #1, #2 and #3: Electrode
• Connect a pH-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 pH electrode in the solution, disable the differential input by shorting terminals #3 (Matching Pin) and #2 (Electrode Reference) with a jumper wire.

Termsinals #4: Dosing selection
• For acid dosage, leave the circuit open.
• For alkaline dosage, short the terminals with a jumper wire.

Termsinals #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 pH value.

Termsinals #6: Power Supply
• Model BL931700-0: connect the 2 wires of a 12 Vdc power adapter to the terminals +12 Vdc and GND.
• Model BL931700-1: 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.

Termsinals #7: Dosing Contact
• This contact drives the dosing system, accordingly to the selected setpoint and dosing direction:
  • if “Acid” dosage is set, the relay is ON and dosing activated if measured value is higher than setpoint;
  • if “Alk” 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.

Termsinals #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 light 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 meter is calibrated;
• 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 pH 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

With meter in measurement mode, immerse electrode and Matching Pin (if available) in pH 7.01 buffer solution, shake briefly and wait for reading to stabilize. Adjust the Offset trimmer until “7.01 pH” is displayed on the LCD.

Disconnect electrode and Matching Pin (if available), immerse them in pH 4.01 (or pH 10.01) buffer solution, shake briefly and wait for reading to stabilize. Adjust the Slope trimmer until “4.01 pH” (or “10.01 pH”) is displayed on the LCD.

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.

Front panel

Rear panel