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INDUSTRIAL PRODUCTS CATALOG



 **HANNA**[®]
instruments
With Great Products, Come Great Results™

Hanna Instruments®

INDUSTRIAL PRODUCTS CATALOG

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Customer support

It is our philosophy that the best way to support our customers is to be closer to them. Hanna Instruments has over 30 offices around the world to provide our customers with dedicated service that is "just around the corner".

Technical department

It is our goal to provide each customer with easy access to one on one technical expertise for operational and application specific assistance.

Extensive warranty

All Hanna products are covered by a parts and labor warranty, ranging from six months to five years.

Reliable products

Over two decades of manufacturing instrumentation to ISO 9001 standards is reflected in every aspect of your Hanna instrument.

Attractive pricing

By developing and manufacturing every product in-house, Hanna pricing is a major source of envy for our competitors. We are reputed to offer the best value on the market.

Continuous innovation

By listening closely to our customers, we are able to provide industrial instruments that offer innovative features and exceptional reliability.

Ready-to-use

Most Hanna portable and bench meter products are supplied with electrode(s) and solutions so they can be used right out of the box. Several models also come with carrying cases, temperature probes, calibration solutions, batteries and electrode holders.

HANNA online

To view Hanna's complete line of products and applications, visit our web page at www.hannainst.com.

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HI 504 pH/ORP Controller with Sensor Check™



Digital Transmitter Input

Many industrial applications require distances from the regulation system to the probe greater than the 15 meters provided by industrial probes. For these situations, the use of a transmitter is necessary.

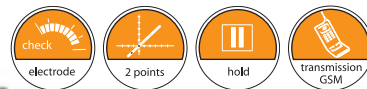
All HI 504 models are supplied with a digital transmitter input. Compared to a traditional analog transmitter, which has a maximum transmission length of 300 meters, our new digital transmitter, HI 504910 permits the connection with the controller at distances up to 1.2 km. The data transmitted can be pH, mV and temperature.

This digital transmitter is compatible with the Sensor Check™ function and therefore guarantees excellent precision with continuous probe inspection.

GSM Cellular Module

The optimization of an industrial process plant means the reduction of costly unscheduled shutdown time. With this in mind, HANNA Instruments® has developed the HI 504900 GSM cellular module* (optional). The HI 504900 is used for sending SMS alarm messages* and also requests live updates on actual process conditions from authorized personnel.

The GSM cellular module can memorize one or two mobile phone numbers, where alarm messages can be sent whenever a malfunction is revealed. The SMS message immediately reports the nature of the alarm. Some causes include: Damaged pH probe, Damaged temperature probe or High setpoint exceeded.



- Sensor check™ pH/ORP electrode diagnostic system
- RS 485 interface
- Digital transmitter input
- Programmable auto-cleaning cycle
- Fail safe alarm system
- Automatic temperature compensation
- Programmable hold system

pH/ORP Controller with Tele-control and Sensor Check

HI 504 introduces an innovation in the concept of pH and ORP control, that enhances the entire line of process controllers engineered by HANNA instruments®. Over 25 years of experience in the production of industrial controllers have enabled us to develop this series of high performance instruments with our new tele-control technology. This technology supplies the means to control, from whatever distance and in real time, one or more installations, allowing the user to optimize operations such as maintenance cycles. With two-way communication supplied by the RS485 output and Windows® compatible software, users can control the complete regulation process from the PC or through SMS via cellular phone.

Measurement reliability is guaranteed by many self-diagnostic and troubleshooting functions, such as our innovative Sensor Check™ feature which is the result of advanced research and application know-how.

The universal BNC connector allows the use of any type of industrial probe chosen for a specific application, but at the same time renders probe replacement a simple and time saving operation.

The HI 504 family offers a wide range of models, designed to fit your individual needs, and is able to satisfy whatever application of monitoring and regulation you require.

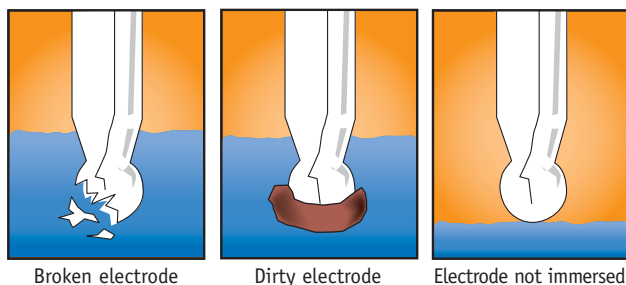
* Compatible phones, plans & SIM cards must be purchased separately from an outside provider and is not in any way covered by HANNA Instruments®

HI 504 pH/ORP Controller with Sensor Check™

Receive electrode status & diagnostic messages on the lcd display or via your mobile-phone!*

Sensor Check™ pH/ORP

As part of the powerful self-diagnostic functions of this instrument series, the Sensor Check™ system provides continuous inspection of probe status. The test is not limited to a simple signal that indicates an error in progress, but it reports the nature of the breakdown with a specific error code. With the use of the HI 504900 GSM module, errors or alarms can be sent directly to the operator's mobile phone as SMS message.



Here are the types of breakdowns shown by sensor check:

- > **pH electrode broken**
- > **Reference electrode dirty**
- > **Reference electrode or matching pin not immersed**
- > **Electrode junction dirty or clogged**
- > **Short-circuit between cables of pH and reference electrodes**
- > **Signal problems from the cable or connector due to humid or dirty environments**

The internal circuit of the instrument executes two independent tests, one for the probe and one for the reference chamber, measuring the respective impedance values every 30 seconds. These tests last for a very short period to avoid electrolysis and polarization, which can be caused by a prolonged exposure to an electric current.

Programmable Cleaning Cycles

Heavy-duty applications often require almost continuous probe maintenance. Elements such as suspended solids, fat, oils, pigments and microorganisms can quickly deposit and soil the glass bulb of a pH probe, the sensor of an ORP probe or the reference junction. To solve these problems the HI 504 series has been equipped with an automatic cleaning system (simple or advanced, depending on model) with programmable cycles.

The Simple Cleaning is a simple wash with either water or detergent, programmed by setting the rinse time and the pause length. The Advanced Cleaning uses both water and detergent, and allows the user to program three stages, with the possibility to vary the sequence, the time, and the number of cycles. The advanced mode can also be triggered at any time from a remote control or through the isolated digital input on the rear panel, which can be connected to an external switch. The controllers can also automatically activate both cleaning modes whenever the sensor check reveals a soiled probe. It is possible to set a delay time before restarting the reading after a cleaning cycle has taken place; this allows the probe to adjust to the new operating conditions.

Direct Wire Connection or Tele-Control through an RS485 Port

The RS485 output is a versatile interface that can be used for connecting the HI 504 controller to many other devices. The simplest configuration is a direct wire connection to a PC (with distances up to 1.2 km), or it is possible to use either a traditional or GSM modem.

The remote control can be managed with the HI 92500 Windows® compatible software. Once connected, the user can interact with the system, view parameters in real time, download process data relative to the last 100 events that have occurred and, if necessary, modify or reconfigure program settings (setpoints, alarms, cleaning cycles, stand-by times, etc.). When a connection is kept active, it is possible to continuously download and automatically store the process data in Excel® format. This data, once saved, can be easily organized into tables and graphs, used for creating records and supervising process progression.

RS485 Network

The RS485 output allows users to create a network composed up to 32 instruments using a simple double-wire cable. The communication speed (up to 19200 bps) allows the user to establish an RS485 network covering an area of up to 1.2 km between the two instruments at both extremities of the network.

The network can be created with HI 504 units or any other HANNA instruments®. industrial controllers with RS485 output (pH 502, mV 602, etc.). The entire network can be managed by our HI 92500 software, using a simple wire connection to a PC, with the HI 504902 traditional modem or a GSM module (HI 504900 or HI 504901).



* Compatible phones, plans & SIM cards must be purchased separately from an outside provider and is not in any way covered by HANNA Instruments®

HI 504 pH/ORP Controller with Sensor Check™

SPECIFICATIONS

Range

-2.00 to 16.00 pH; -2000 to 2000 mV;
-30 to 130.0°C

Resolution

0.01 pH; 1 mV/0.1°C above -10°C; 1°C below -10°C

Accuracy (@20°C/68°F)

±0.02 pH; ±2 mV; ±0.5°C (-9.9 to 130.0°C);
±1°C (-30 to -10°C)

Input Impedance

10¹² Ohm

Digital Output

Isolated output, contact closed upon HOLD mode

Analog Output

1 or 2 independent outputs (configuring as 0-20 mA
or 4-20 mA)

Dosing and Alarm Relay

Electromechanical relay SPDT contact output;
5A-250VAC, 5A-30VDC (resistive load). Fuse
protected: 5A, 250V Quick Blow Fuse

Temperature Compensation

Automatic or manual, -30 to 130°C

Temperature Probe

Pt 100/Pt 1000 sensor (with automatic
recognition and damage test)

Power Supply

24VDC/AC, 115VAC ±10%, 230VAC ±10%,
100VAC ±10%; 50/60Hz

Environment

0 to 50°C (32 to 122°F); max 85% RH
non-condensing

Casing

IP54 (front panel)

Dimensions

Panel cutout: 140 x 140 mm,
instrument: 144 x 144 x 170mm

Weight

1.6 kg (3.5 lb.)

Programmable Hold System

The hold function allows the user to stop the regulating action of the controller for programmable time periods. It is possible to activate the hold periods in correspondence to programmed operations, such as plant maintenance, cleaning procedures and instrument calibration.

Fail-Safe Alarm System

HANNA instruments® exclusive Fail-safe Alarm System protects against problems caused by power supply failure or signal interruption, which are typical risks in industrial environments. The system acts both on a hardware and a software level. The alarm relay functions in a normally closed condition, and is tripped when there is a power failure if, for example, the power cable is accidentally cut. This function is very important in industrial plants where alarms are usually not activated if there is a power supply interruption, which can cause serious damage due to a loss of control of the process plant. At the software level, the fail safe function activates an alarm in case of abnormal circumstances, for example if the dosing contacts remain closed for an excessive period. The alarm condition is also signaled by a red LED, located directly on the front panel of the controller.

Logging of the Last 100 Events

With the HI 504 series, it is possible to recall the sequence of last 100 occurred events at any time: errors, calibrations performed, set parameter changes and cleaning cycles. Every code shown on the display corresponds to a certain type of event, error or operation. Errors that are still active are indicated by a flashing code, while operations and alarms recorded or already concluded appear with a fixed code on the display.

Analog Output: Data Logging or PID Dosage Control

Models are available with one or two analog outputs. These outputs can be connected to a recorder for the cataloging of process data (pH/mV and temperature), or can be used for controlling dosing systems (pumps or electrovalves) using PID control.

UL Certification

The HI 504 process controller series complies with the production standards required by the Underwriters Laboratories (UL), one of the most important international authorities for device safety, and has obtained the following UL certification:



ORDERING INFORMATION:

Each HI 504 model is supplied complete with mounting brackets and instruction manual. Match the last letters in the product code to the corresponding numbers according to desired configuration.

For a complete range of pH electrodes, see pages 63-71

X=1, single setpoint
X=2, dual setpoint
X=8, single setpoint & advanced cleaning
X=9, dual setpoint & advanced cleaning

Y=1, ON/OFF control
Y=2, ON/OFF & PID control

Z=2, single analog output
Z=4, dual analog output

a=0, 24 VDC/AC power supply
a=1, 115VAC power supply
a=2, 230VAC power supply
a=3, 100VAC power supply

HI 504XYZ-a

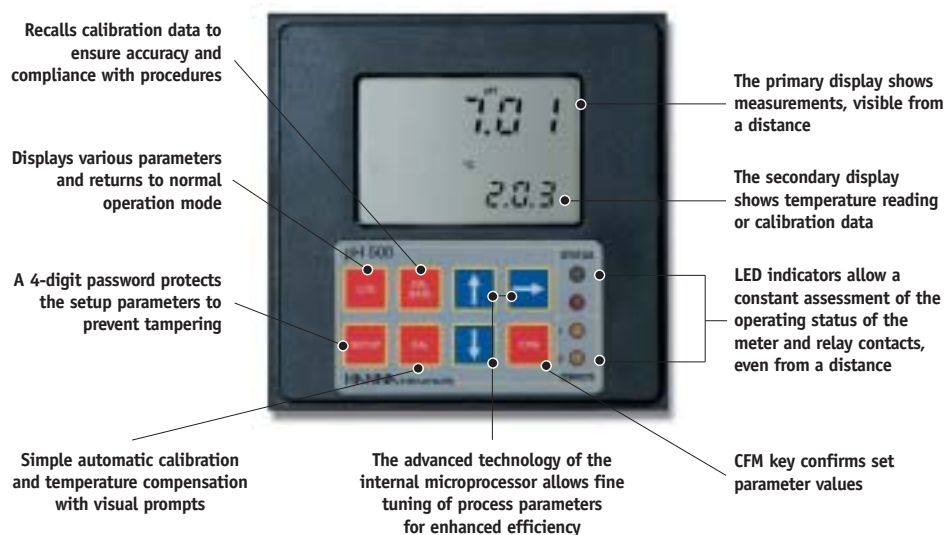
ACCESSORIES:

HI 504900	GSM module*	HI 7004/1L	pH 4.01 buffer solution, 1 L bottle
HI 504901	GSM supervisor	HI 7006/1L	pH 6.86 buffer solution, 1 L bottle
HI 504902	RS485 modem (PSTN)	HI 7007/1L	pH 7.01 buffer solution, 1 L bottle
HI 504910	Digital transmitter	HI 7009/1L	pH 9.18 buffer solution, 1 L bottle
HI 92500	Windows® compatible software	HI 7010/1L	pH 10.01 buffer solution, 1 L bottle
HI 7610	Stainless steel temperature probe with Pt100 sensor and 5 m cable	HI 7020L	200-275 mV test solution, 500 mL bottle
HI 7611	Stainless steel temperature probe with Pt1000 sensor and 5 m cable	HI 7091L	Reducing solution, 500 mL bottle
		HI 7092L	Oxidizing solution, 500 mL bottle

* A SIM card for HI 504900 must be purchased separately by an outside provider and is not in any way covered by HANNA Instruments®

pH, mV, Conductivity and TDS Panel Mount Controllers

The HANNA instruments® line of industrial microprocessor-based controllers offer a multitude of features such as single and dual setpoints, ON/OFF, proportional and PID control, relay outputs, user-selectable zoom, bidirectional isolated RS232, RS485 port, isolated recorder outputs in mAmps and Volts, and much more.



- Two ID numbers to identify a specific process in a particular factory
- High and low setpoints can be adjusted with 0.01 pH, 1 mV, 0.1 µS and 0.01 ppm resolution
- The hysteresis bands in ON/OFF controls can be regulated with 0.01 pH, 1 mV, 0.1 µS and 0.01 ppm resolution
- The span in proportional controls can be fine tuned in all measurement ranges
- Setting of the reset and rate times for models with PID control
- Two independent alarm bands for high and low setpoints to guarantee a timely warning
- Choose the max. time the relay contacts may remain closed before the alarm is triggered
- Setting of the analog output range (mA or VDC) and corresponding measurement ranges (pH, mV, EC and TDS)

Simple to Use

The large, dual-level LCD shows both pH (or mV) or EC (or TDS) and temperature and guides operators through calibration and programming with step-by-step prompts. The choice of ON/OFF, proportional and PID control provides extra versatility and makes it possible to pick the process controller that best fits your application. Keeping track of multiple controllers in different plants is made easy. These advanced controllers can be identified with both a factory and a process ID.

Fail-Safe Protection

The Fail-Safe alarms protect processes against critical errors arising from power interruptions, surges and human errors. The sophisticated yet easy-to-use system resolves these problems on two fronts: hardware and software. To eliminate blackout and line failure problems, the alarm function operates in a "Normally Closed" state and goes off if the wires are accidentally tripped, or when the power is down. This is an important feature since with most meters the alarm terminals close in abnormal situations, but no alarm is sounded with a line interruption, causing extensive damage. With our controllers, software is employed to set off the alarm in abnormal circumstances, for example, if the dosing terminals are closed too long. The alarm message is also displayed on the LCD.

Save Money with Custom Programs

These series of controllers put a host of parameters at your disposal to prevent overdosing or costly system failures. You can set your high and low set point hysteresis bands independently to fine tune dosing processes with the ON/OFF controllers. Similarly, the proportional band and time period are user-programmable to save on slow reacting chemicals, which are commonly overdosed. Moreover, the mV 602 series include models with PID (Proportional Integrative Derivative) control. All models offer an adjustable timer from 10 minutes to 7 days as the maximum time that the relay contacts may remain closed. An important feature in case of sudden chemical depletion. In addition, a contact for level control ensures proper functioning of the process.

Galvanically Isolated Outputs with Zoom

Some models incorporate hardware selectable isolated current or voltage output. These can drive auxiliary devices, chart recorders and provide remote monitoring. Users can also zoom on to any 2 points from the full measurement scale. These lines of industrial controllers include models that provide control through analog output. Now any compatible device such as electrovalves or pumps may be driven with these advanced controllers.

Password Protection

HANNA instruments® password protection feature keeps these controllers safe from tampering. Only users with the proper password can change the settings of these hi-tech controllers.

pH 500 pH Controller



SPECIFICATIONS

Range

0.00 to 14.00 pH; -9.9 to 120°C

Resolution

0.01 pH; 0.1°C

Accuracy (@20°C/68°F)

±0.02 pH; ±0.5°C

Input Impedance

10¹² Ohm

pH Calibration

automatic, 1, 2 or 3 point, at pH 4.01, 7.01, 10.01

Temperature Compensation

automatic (with Pt100 probe) or manual
 from -9.9 to 120°C

Outputs

digital: RS232 bi-directional optoisolated; or
 analog, galvanically isolated: 0-1 mA, 0-20 mA
 and 4-20 mA, 0-5 VDC, 1-5 VDC and 0-10 VDC

Setpoint Relay

1 or 2 contact outputs SPDT 5A-250 VAC, 5A-30 VDC
 (resistive load)

Power Supply

115 VAC ±10% or 230 VAC ±10%; 50/60 Hz

Environment

0 to 50°C (32 to 122°F); RH max 95%
 non-condensing

Dimensions

panel cutout: 140 x 140 mm,
 instrument: 144 x 144 x 170 mm

Weight

1.6 kg (3.5 lb.)



- Single or dual setpoint
- Fully programmable
- Microprocessor memory
- mA & VDC recorder output or RS232
- Differential input for ground loop protection
- Automatic 3 point calibration
- Last calibration data
- Automatic temperature compensation
- Simple wiring with removable terminal modules

pH 500 series of controllers are simple-to-operate, microprocessor-based process meters packed with features. For more flexibility and better resolution for chart recorders, any two points between 0 and 14 pH can be chosen to correspond to the analog output spans. Several pH 500 models are equipped with a bi-directional RS232 port. Push button password programming prevents tampering.

The microprocessor memory is fully programmable and has a 3 month backup power supply. The Fail Safe Alarm system protects the pH 500 against the pitfalls of process control, like power interruption or line failure. With the pH 500, quick 1, 2 or 3 point calibration at pH 4.01, 7.01 and 10.01 comes standard. The temperature can be manually or automatically compensated for. Models with RS232 output allow computer compatibility, a necessity for process control instrumentation. You can also choose from ON/OFF or Proportional Dosage to save on chemicals.

ORDERING INFORMATION:

Each pH 500 model is supplied complete with mounting brackets and instructions.

ACCESSORIES:

- HI 7004L** pH 4.01 buffer solution, 500 mL bottle
- HI 7007L** pH 7.01 buffer solution, 500 mL bottle
- HI 7010L** pH 10.01 buffer solution, 500 mL bottle

For a complete range of pH electrodes, see pages 63-71

Example: pH 500221-1

pH controller with dual setpoint, proportional control, analog output and 115 VAC power supply.

X=1, single setpoint X=2, dual setpoint
Y=1, ON/OFF control Y=2, proportional control
Z=1, analog output Z=2, RS232 output
a=1, 115 VAC power supply a=2, 230 VAC power supply

pH 500XYZ-a

mV 602 ORP Controller with Matching Pin and PID Control



- Control through analog output (single setpoint)
- Fully programmable microprocessor memory
- RS485 interface
- Differential input for ground loop protection
- Automatic 2 point calibration
- Last calibration data
- Automatic temperature compensation
- Simple wiring with removable terminal modules

The mV 602 line of microprocessor controllers have been engineered to incorporate ease of use with a powerful set of features. These robust instruments can be configured to utilize P, PI or PID controlling. This means you don't need to choose from three separate instruments that only allow one configuration.

The mV 602 line includes models that incorporate control through analog output to drive compatible devices such as electrovalves or pumps. Several models feature bidirectional RS485 to allow remote operation with a PC as well as analog recorder output. The fully programmable microprocessor memory has a 3 month backup power supply. The Fail Safe Alarm system protects against power interruption or line failure. Use of a Solid State Relay has been included to meet the needs of extreme industrial applications.

All models incorporate a differential input so a grounding bar may be attached, extending the life of the electrodes by eliminating ground loop current problems.

ORDERING INFORMATION:

Each mV 602 model is supplied complete with mounting brackets and instructions.

ACCESSORIES:

- HI 7020L 200-275 mV test solution, 500 mL bottle
- HI 7091L Reducing solution, 500 mL bottle
- HI 7092L Oxidizing solution, 500 mL bottle
- HI 8427 pH/ORP electrode simulator
- HI 931001 pH/ORP electrode simulator with display

For a complete range of ORP electrodes, see pages 63-71

Example: mV 602113-1

ORP controller with single setpoint, proportional control, analog and RS485 output and 115 VAC power supply.

X=1, single setpoint
X=3, dual setpoint
X=5, control through analog output

Y=1, ON/OFF control (X=1 only)
Y=2, ON/OFF and PID controls

Z=1, analog output (X=3 only)
Z=2, RS485 output (X=3 only)
Z=3, analog and RS485 outputs

a=1, 115 VAC power supply
a=2, 230 VAC power supply

mV 602XYZ-a

SPECIFICATIONS

Range

-2000 to 2000 mV; -9.9 to 120°C

Resolution

1 mV; 0.1°C

Accuracy (@20°C/68°F)

±2 mV; ±0.5°C

Input Impedance

10¹² Ohm

ORP Calibration

automatic, at 0 and 350 or 1900 mV

Outputs

digital: RS485 bi-directional opto-isolated; or analog, galvanically isolated: 0-1 mA, 0-20 mA and 4-20 mA, 0-5 VDC, 1-5 VDC and 0-10 VDC

Setpoint Relay

SPDT contact output, 5A-250 VAC, 5A-30 VDC (resistive load) or Solid State Relay (SSR), 1A, 250 VAC (resistive and inductive load)

Power Supply

115 VAC ±10% or 230 VAC ±10%; 50/60 Hz

Environment

0 to 50°C (32 to 122°F); RH max 95% non-condensing

Dimensions

panel cutout: 140 x 140 mm
instrument: 144 x 144 x 170 mm

Weight

1.6 kg (3.5 lb.)

mV 600 ORP Controller with Matching Pin



SPECIFICATIONS

Range

-2000 to 2000 mV; -9.9 to 120°C

Resolution

1 mV; 0.1°C

Accuracy (@20°C/68°F)

±2 mV; ±0.5°C

Input Impedance

10¹² Ohm

ORP Calibration

automatic, at 0 and 350 or 1900 mV

Outputs

digital: RS232 bi-directional optoisolated; or analog, galvanically isolated: 0-1 mA, 0-20 mA and 4-20 mA, 0-5 VDC, 1-5 VDC and 0-10 VDC

Setpoint Relay

contact output SPDT 5A-250 VAC, 5A-30 VDC (resistive load)

Power Supply

115 VAC ±10% or 230 VAC ±10%; 50/60 Hz

Environment

0 to 50°C (32 to 122°F); RH max 95% non-condensing

Dimensions

panel cutout: 140 x 140 mm
instrument: 144 x 144 x 170 mm

Weight

1.6 kg (3.5 lb.)



- Fully programmable microprocessor memory
- mA & VDC recorder output or RS232
- Differential input for ground loop protection
- Automatic 2 point calibration
- Last calibration data
- Automatic temperature compensation
- Simple wiring with removable terminal modules

The mV 600 controllers have been engineered with the same outstanding features as the pH 500 meters. The microprocessor memory is fully programmable and has a 3 month backup power supply. The Fail Safe Alarm system protects these meters against the pitfalls of process control.

User selectable timing capability safeguards against overdosing. These instruments have a differential input, extending electrode life by eliminating ground loop current through the reference. Users can choose between ON/OFF and Proportional control as well as selectable current and voltage outputs. For more flexibility and better resolution for chart recorders, choose any two points between 0 and 2000 mV to correspond to the analog output spans. RS232 capability makes two mV 600 models PC compatible. Wiring the controllers is simple with extractable terminal modules. A host of self-testing features and user-friendly functions make mV 600 a great value.

ORDERING INFORMATION:

Each mV 600 model is supplied complete with mounting brackets and instructions.

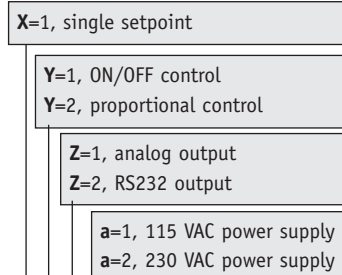
ACCESSORIES:

- HI 7020L** 200-275 mV test solution, 500 mL bottle
- HI 7091L** Reducing solution, 500 mL bottle
- HI 7092L** Oxidizing solution, 500 mL bottle
- HI 8427** pH/ORP electrode simulator
- HI 931001** pH/ORP electrode simulator with display

For a complete range of ORP electrodes, see pages 63-71

Example: mV 600121-1

ORP controller with single setpoint, proportional control, analog output and 115 VAC power supply.



mV 600XYZ-a

HI 700 • HI 710 Conductivity and TDS Controllers



- Fully programmable microprocessor memory
- Dual setpoints
- mA & VDC recorder output
- Differential input for ground loop protection
- Automatic 1 or 2 point calibration
- Last calibration data
- Manual or automatic temperature compensation
- Extensive range for both conductivity and TDS

The HI 700 series of regulators offer state-of-the-art specifications for your process control. They can be configured for ON/OFF, Proportional, PI or PID control. Thanks to our exclusive technology, they can be customized to best fit your application.

A menu-driven display aids the user throughout the operations with running messages and clear prompts. All relevant parameters can be simply adjusted and will remain memorized until overwritten. Bright LED lights show the current status even from a distance. With self-diagnostic features and extractable terminals, installation and maintenance are rapid and simple. Password protection guarantees that the calibration and predetermined parameters cannot be altered unnecessarily. The controllers can operate with 4-ring probe or 4-20 mA signal. They accept probes with or without a built-in Pt100 temperature sensor. HI 710 monitors and controls both conductivity and TDS.

ORDERING INFORMATION:

Each model is supplied complete with mounting brackets and instructions as well as dual setpoint, ON/OFF and PID controls.

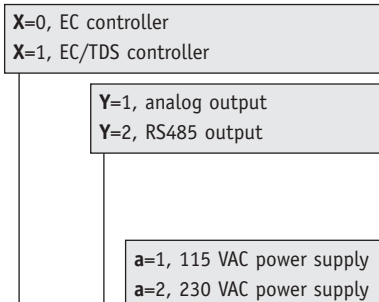
ACCESSORIES:

- HI 504901** GSM supervisor
- HI 7030L** 12880 µS/cm cal. solution, 500 mL bottle
- HI 7031L** 1413 µS/cm cal. solution, 500 mL bottle
- HI 7033L** 84 µS/cm calibration 500 mL bottle
- HI 7034L** 80000 µS/cm cal. solution, 500 mL bottle

For a complete range of ORP electrodes, see pages 63-71

Example: HI700221-1

EC controller with dual setpoint, ON/OFF and PID controls, analog output and 115 VAC power supply.



HI 7X022Y-a

SPECIFICATIONS

Range

EC: 0.0 to 199.9 µS/cm; 0 to 1999 µS/cm, 0.00 to 19.99 mS/cm; 0.0 to 199.9 mS/cm;
TDS (HI 710 only): 0.0 to 100.0 ppm; 0 to 1000 ppm; 0.00 to 10.00 ppt; 0.0 to 100.0 ppt;
Temperature: -10.0 to 100.0°C

Resolution

0.1 µS; 1 µS; 0.01 mS; 0.1 mS; (HI 710 only) 0.1 ppm; 1 ppm; 0.01 ppt; 0.1 ppt; 0.1°C;

Accuracy (@20°C/68°F)

±0.5% F.S. (EC/TDS); ±0.5°C (0 to 70°C); ±1°C (outside)

EC Calibration

automatic or manual at 1 point

Temperature Compensation

automatic (with Pt100 probe) or manual from -10 to 100°C with β = 0.00 to 10.00%/°C

TDS Conversion Factor (HI 710 only)

adjustable from 0.00 to 1.00 (HI 710 only)

Outputs

analog: isolated 0-1 mA, 0-20 mA and 4-20 mA; 0-5 VDC, 1-5 VDC and 0-10 VDC or digital: RS485 bi-directional opto-isolated

Analog Input

4-20 mA

Setpoint Relay

2 contact outputs SPDT 5A-250 VAC, 5A-30 VDC (resistive load)

Alarm Relay

contact output SPDT 5A-250 VAC, 5A-30 VDC (resistive load)

Power Supply

115 VAC ±10% or 230 VAC ±10%; 50/60 Hz

Environment

0 to 50°C (32 to 122°F); RH max 95% non-condensing

Dimensions

panel cutout: 140 x 140 mm
instrument: 144 x 144 x 170 mm

Weight

1.6 kg (3.5 lb.)

Wall Mounted Controllers

Microprocessor pH and ORP Controllers

This line of industrial microprocessor controllers offers a wide range of features and functions such as single and dual setpoints, ON/OFF, proportional and PID control, relay outputs, user-selectable zoom, bidirectional isolated RS485, isolated recorder outputs in mAmps and volts, differential input, control through analog output and Fail-Safe Features.

Simple to Use

The large, dual-level LCD shows both pH (mV) and temperature and guides operators through calibration and programming with step-by-step prompts. The choice of ON/OFF, proportional and PID control provides extra versatility and makes it possible to pick the process controller that best fits your application. Keeping track of multiple controllers in different plants is made easy. These advanced controllers can be identified with both a factory and a process ID.

Save Money with Custom Programs

HI 21 and HI 22 help to prevent overdosing or costly system failures. You can set your high and low setpoint hysteresis bands independently to fine tune dosing processes with the ON/OFF controllers. Similarly, the proportional band and time period are user-programmable to save on slow reacting chemicals which are commonly overdosed.

All models offer an adjustable timer from 10 minutes to 7 days as the maximum time that the relay contacts may remain closed. An important feature in case of sudden chemical depletion, truncated intake or discharge tubing and other calamities. With these silicon guardians users can rest assured that processes are operating efficiently and safely.

Fail-Safe Protection

The Fail-Safe alarms protect processes against critical errors arising from power interruptions, surges and human errors. The sophisticated yet easy-to-use system resolves these problems on two fronts: hardware and software. To eliminate blackout and line failure problems, the alarm function operates in a "Normally Closed" state and goes off if the wires are accidentally tripped, or when the power is down. This is an important feature since with most meters the alarm terminals close in abnormal situations, but no alarm is sounded with a line interruption, causing extensive damage. With our controllers, software is employed to set off the alarm in abnormal circumstances, for example, if the dosing terminals are closed too long and in both cases, a red LED will also provide a visual warning signal.

Differential Input (Matching Pin)

All HANNA instruments® controllers in this family come with a differential input to prevent problems due to ground loop current. With this new feature the life of the electrodes will be greatly extended.

Password Protection

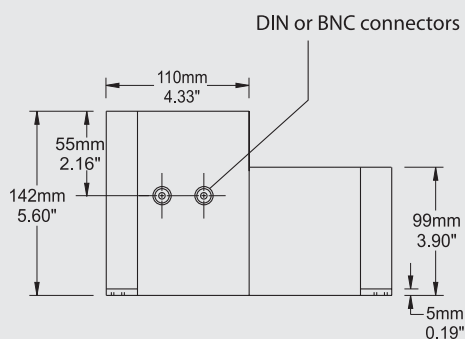
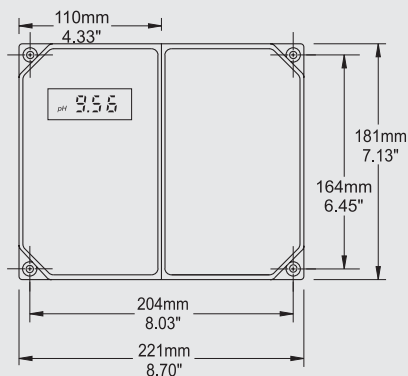
HANNA instruments® password protection feature keeps these controllers safe from tampering. Only users with the proper password can change the settings of these hi-tech controllers.

Simple Installation

The wall mounted controllers have mounting holes molded into the housing to assure simple, quick and secure installation without the need for additional hardware. Once all electrical connections are made, the protective cover can be installed over the front panel, making it possible to perform all adjustments without disassembling any part of the unit. Temperature probes can also be installed. Pumps to be used in conjunction with the controller simply plug into the controller's input and will be powered up through the unit's internal power supply.

Mechanical Dimensions

The modular design isolates electrical connections in a closed compartment, while the control settings are accessible and can be made through the adjacent compartment.



HI 21 pH Controller



- Control through analog output (single setpoint)
- Fully programmable microprocessor memory
- RS485 interface
- Differential input for ground loop protection
- Automatic 3 point calibration
- Last calibration data
- Automatic temperature compensation

The HI 21 controllers are simple-to-operate, microprocessor-based process meters packed with features. For more flexibility and better resolution for chart recorders, any two points between 0 and 14 pH can be chosen to correspond to the analog output spans. Some HI 21 models are equipped with a bi-directional RS485 port, which allows remote control of the instrument from a PC. Push button password programming prevents tampering. The microprocessor memory is fully programmable and has a 3 month backup power supply. The Fail Safe Alarm system protects the HI 21 against the pitfalls of process control, like power interruption or line failure. With HI 21 quick 1, 2 or 3 point calibration at pH 4.01, 7.01 and 10.01 comes standard. The temperature can be manually or automatically compensated for. You can also choose from ON/OFF, Proportional and PID control to save on chemicals.

ORDERING INFORMATION:

Each HI 21 model is supplied complete with instructions.

ACCESSORIES:

- HI 7004L pH 4.01 buffer solution, 500 mL bottle
- HI 7007L pH 7.01 buffer solution, 500 mL bottle
- HI 7010L pH 10.01 buffer solution, 500 mL bottle
- HI 8427 pH / ORP electrode simulator
- HI 931001 pH / ORP electrode simulator with display

For a complete range of pH electrodes, see pages 63-71

Example: HI 21111-1

pH controller with single setpoint, ON/OFF control, analog output and 115 VAC power supply.

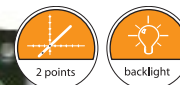
HI 21XYZ-a

<p>X=1, single setpoint X=2, dual setpoint X=5, control through analog output</p>
<p>Y=1, ON/OFF control (not for X=5) Y=2, ON/OFF and proportional control</p>
<p>Z=1, analog output Z=2, RS485 port Z=3, analog output and RS485 (X=5 only)</p>
<p>a=1, 115 VAC power supply a=2, 230 VAC power supply</p>

SPECIFICATIONS

- Range**
0.00 to 14.00 pH; -9.9 to 120°C
- Resolution**
0.01 pH; 0.1°C
- Accuracy (@20°C/68°F)**
±0.02 pH; ±0.5°C
- Input Impedance**
10¹² Ohm
- pH Calibration**
Automatic, 1, 2 or 3 point, at pH 4.01, 7.01, 10.01
- Temperature Compensation**
automatic (with Pt100 probe) or manual from -9.9 to 120°C
- Outputs**
digital: RS485 bi-directional opto-isolated; or analog, galvanically isolated: 0-1 mA, 0-20 mA and 4-20 mA, 0-5 VDC, 1-5 VDC and 0-10 VDC
- Setpoint Relay**
1 or 2 contact outputs SPDT 5A-250 VAC, 5A-30 VDC (resistive load); fuse: 5A, 250V
- Alarm Relay**
contact output SPDT 5A-250 VAC, 5A-30 VDC (resistive load); fuse: 5A, 250V
- Power Supply**
115 VAC ±10% or 230 VAC ±10%; 50/60 Hz; fuse: 400 mA, 250 V
- Power Consumption**
15 VA
- Environment**
0 to 50°C (32 to 122°F); RH max. 85% non-condensing
- Protection**
IP 54
- Dimensions**
221 x 181 x 86 mm (8.7 x 7.1 x 3.4")
- Weight**
1.4 kg (3.1 lb.)

HI 22 ORP Controller



SPECIFICATIONS

Range

-2000 to 2000 mV; -9.9 to 120°C

Resolution

1 mV; 0.1°C

Accuracy (@20°C/68°F)

±2 mV; ±0.5°C

Input Impedance

10¹² Ohm

ORP Calibration

automatic, at 0 and 350 or 1900 mV

Outputs

digital: RS485 bi-directional opto-isolated; or analog, galvanically isolated: 0-1 mA, 0-20 mA and 4-20 mA, 0-5 VDC, 1-5 VDC and 0-10 VDC

Setpoint Relay

contact output SPDT 5A-250 VAC, 5A-30 VDC (resistive load); fuse: 5A, 250V

Alarm Relay

contact output SPDT 5A-250 VAC, 5A-30 VDC (resistive load); fuse: 5A, 250V

Power Supply

115 VAC ±10% or 230 VAC ±10%; 50/60 Hz; fuse: 400 mA, 250 V

Power Consumption

15 VA

Environment

0 to 50°C (32 to 122°F); RH max. 85% non-condensing

Protection

IP 54

Dimensions

221 x 181 x 86 mm (8.7 x 7.1 x 3.4")

Weight

1.4 kg (3.1 lb.)



- Fully programmable microprocessor memory
- RS485 interface
- Differential input for ground loop protection
- Automatic 2 point calibration
- Last calibration data
- Automatic temperature compensation

The HI 22 controllers have been engineered with the same outstanding features as the HI 21 meters. The microprocessor memory is fully programmable and has a 3-month backup power supply. The Fail Safe Alarm system protects these meters against the pitfalls of process control. User-selectable timing capability safeguards against overdosing and saves money while protecting the environment. These instruments have a differential input, extending electrode life by eliminating ground loop current through the reference. Users can choose between ON/OFF and Proportional control as well as selectable current and voltage outputs. For more flexibility and better resolution for chart recorders, choose any two points between 0 and 2000 mV to correspond to the analog output spans. RS485 capability makes one model PC compatible. Wiring the controllers is simple with extractable terminal modules. A host of self-testing features and user-friendly functions make HI 22 a great value.

ORDERING INFORMATION:

Each HI 22 model is supplied complete with instructions.

XYZ=111, single setpoint, ON/OFF control and analog output
XYZ=122, single setpoint, ON/OFF and proportional control, RS485 port

a=1, 115 VAC power supply
a=2, 230 VAC power supply

HI 22XYZ-a

Example: HI 22122-1

ORP controller with single setpoint, ON/OFF and proportional control, RS485 port and 115 VAC power supply.

ACCESSORIES:

- HI 7020L 200-275 mV test solution, 500 mL bottle
- HI 7091L Reducing solution, 500 mL bottle
- HI 7092L Oxidizing solution, 500 mL bottle
- HI 8427 pH/ORP electrode simulator
- HI 931001 pH/ORP electrode simulator with display

For a complete range of ORP electrodes, see pages 63-71

HI 24 EC and TDS Controllers



- Works with 4-ring potentiometric probe
- Drives external devices
- Automatic EC calibration
- Automatic temperature compensation

HI 24 is a new series of wall mounted, microprocessor-based EC and TDS controllers. Thanks to the 4-ring probe and automatic temperature compensation feature, these meters can provide very accurate EC and TDS measurements. You can choose among models featuring ON/OFF or PID control, analog input and output, double setpoint. The relay contacts can drive external devices as, for example, pumps or electrovalves. The input signal can come from a probe or a 4-20 mA transmitter.

Models with RS485 output are also available. This option allows the user to install the controller into a 2-wire RS485 network.

ORDERING INFORMATION:

Each HI 24 model is provided with dual setpoint and is supplied complete with instructions.

X=1, ON/OFF control
X=2, ON/OFF and PID Controls

Y=1, analog output
Y=2, RS485 port

a=1, 115 VAC power supply
a=2, 230 VAC power supply

ACCESSORIES:

- HI 7030L 12880 µS/cm calibration solution, 500 mL bottle
- HI 7031L 1413 µS/cm calibration solution, 500 mL bottle
- HI 7033L 84 µS/cm calibration solution, 500 mL bottle
- HI 7034L 80000 µS/cm calibration solution, 500 mL bottle

For a complete range of EC/TDS probes, see pages 72-73

HI 242XY-a

Example: HI 24212-1

EC/TDS controller with ON/OFF control, RS485 port and 115 VAC power supply.

SPECIFICATIONS

Range

EC: 0.0 to 199.9 µS/cm; 0 to 1999 µS/cm; 0.00 to 19.99 mS/cm; 0.0 to 199.9 mS/cm
TDS: 0.0 to 100.0 ppm; 0 to 1000 ppm;
0.00 to 10.00 ppt; 0.0 to 100.0 ppt
Temperature: -10.0 to 100.0°C

Resolution

EC: 0.1 µS/cm; 1 µS/cm; 0.01 mS/cm; 0.1 mS/cm
TDS: 0.1 ppm; 1 ppm; 0.01 ppt; 0.1 ppt
Temperature: 0.1 °C

Accuracy (@20°C/68°F)

0.5% F.S. (EC / TDS); ±0.5°C (0 to 70°C), ±1°C (outside)

EC Calibration

automatic, 1 point

Temperature Compensation

automatic or manual from -10 to 100°C with β adjustable from 0.00 to 10.00%/°C

TDS Conversion Factor

adjustable from 0.00 to 1.00

Outputs

digital: RS485 bi-directional opto-isolated; or analog, galvanically isolated: 0-1 mA, 0-20 mA and 4-20 mA, 0-5 VDC, 1-5 VDC and 0-10 VDC

Setpoint Relay

2 contact outputs SPDT 5A-250 VAC, 5A-30 VDC (resistive load); fuse: 5A, 250V

Alarm Relay

contact output SPDT 5A-250 VAC, 5A-30 VDC (resistive load); fuse: 5A, 250V

Power Supply

115 VAC ±10% or 230 VAC ±10%; 50/60 Hz; fuse: 400 mA, 250 V

Power Consumption

15 VA

Environment

0 to 50°C (32 to 122°F); RH max. 85% non-condensing

Protection

IP 54

Dimensions

221 x 181 x 86 mm (8.7 x 7.1 x 3.4")

Weight

1.6 kg (3.5 lb.)

HI 23 EC Controller

SPECIFICATIONS

Range

EC: 0.0 to 199.9 $\mu\text{S}/\text{cm}$; 0 to 1999 $\mu\text{S}/\text{cm}$;
 0.00 to 19.99 mS/cm ; 0.0 to 199.9 mS/cm ;
 Temperature: -10.0 to 100.0°C

Resolution

EC: 0.1 $\mu\text{S}/\text{cm}$; 1 $\mu\text{S}/\text{cm}$; 0.01 mS/cm ; 0.1 mS/cm ;
 Temperature: 0.1 °C

Accuracy (@20°C/68°F)

0.5% F.S. (EC); $\pm 0.5^\circ\text{C}$ (0 to 70°C), $\pm 1^\circ\text{C}$ (outside)

Calibration

automatic, 1 point

Temperature Compensation

automatic or manual from -10 to 100°C with β
 adjustable from 0.00 to 10.00%/°C

Outputs

digital: RS485 bi-directional opto-isolated; or
 analog, galvanically isolated: 0-1 mA, 0-20 mA
 and 4-20 mA, 0-5 VDC, 1-5 VDC and 0-10 VDC

Setpoint Relay

2 contact outputs SPDT 5A-250 VAC, 5A-30 VDC
 (resistive load); fuse: 5A, 250V

Alarm Relay

contact output SPDT 5A-250 VAC, 5A-30 VDC
 (resistive load); fuse: 5A, 250V

Power Supply

115 VAC $\pm 10\%$ or 230 VAC $\pm 10\%$; 50/60 Hz;
 fuse: 400 mA, 250 V

Power Consumption

15 VA

Environment

0 to 50°C (32 to 122°F);
 RH max. 85% non-condensing

Protection

IP 54

Dimensions

221 x 181 x 86 mm (8.7 x 7.1 x 3.4")

Weight

1.6 kg (3.5 lb.)



- Works with 4-ring potentiometric probe
- Drives external devices
- Automatic EC calibration
- Automatic temperature compensation

HI 23 is a new series of wall mounted, microprocessor conductivity controllers. Thanks to the 4-ring EC probe and automatic temperature compensation feature, these meters can provide very accurate measurements. You can choose among models featuring ON/OFF or PID control, analog input and output, double setpoint. The relay contacts can drive external devices as, for example, pumps or electrovalves. The input signal can come from a probe or a 4-20 mA transmitter. Models with RS485 output are also available. This option allows the user to install the controller into a 2-wire RS485 network.

ORDERING INFORMATION:

Each HI 23 model is provided with dual setpoint and is supplied complete with instructions.

X=1, ON/OFF Control
X=2, ON/OFF and PID Controls
Y=1, analog output
Y=2, RS485 port
a=1, 115 VAC power supply
a=2, 230 VAC power supply

HI 232XY-a

ACCESSORIES:

HI 7030L	12880 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle
HI 7031L	1413 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle
HI 7033L	84 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle
HI 7034L	80000 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle

For a complete range of conductivity probes, see pages 72 & 73

HI 9910 pH Controller with Single Setpoint



HI 9910 is a pH controller with a single setpoint for proportional dosage of acid or alkaline solutions. Any pH electrode ending in a BNC connector can be directly attached to the controller.

The proportional control can be fine tuned through two dials on the front panel. The time cycle is adjustable from 0 to 90 seconds and the proportional band from 0.0 to 2.0 pH. Coarse and fine as well as offset and slope trimmers make accurate setting and calibration easy and convenient. A pump or electro-valve can be wired directly to the controller and be powered through the terminals.

The HI 9910 also provides for an alarm relay. The alarm is activated when the measurements stray away from the setpoint by a predetermined value in the 0.5 to 2.5 pH range. A max. dosing time from 1 to 10 minutes can also be set, after which the alarm is activated to warn of an abnormality. The alarm can be configured in either normally-closed or normally-open state. HI 9910 also provides an isolated output signal which is user selectable between 0-20 or 4-20 mA.

A dial on the front panel renders manual temperature compensation fast and easy. For automatic compensation, hook up a 3 wire Pt100 to the controller. To speed up wiring, the HI 9910 comes with extractable terminal modules. Once wired up, the compartment containing the connections is protected behind a fire-retardant ABS panel. Several LED's show whether the setpoint or alarm relays are activated from a distance.

SPECIFICATIONS

Range

0.00 to 14.00 pH

Resolution

0.01 pH

Accuracy (@20°C/68°F)

±0.02 pH

Input Impedance

10¹² Ohm

Calibration

manual, 2 point, through trimmers on the front panel

Temperature Compensation

automatic from 0 to 50°C with Pt100 probe or manual from -10 to 80°C

Setpoint

selectable from 0.00 to 14.00 pH

Recorder Output

selectable at 0-20 mA or 4-20 mA (isolated)

Proportional Control

adjustable from 0.0 to 2.0 pH and time cycle from 0 to 90 seconds

Dosing Contact

1 powered terminal for pH correction (115 or 240 V) Max. 2A, 1,000,000 strokes; activated when pH > setpoint for acid dosage or when pH < setpoint for alkaline dosage

Alarm Relay

1, activated when pH varies more than a selectable value (0.5 to 2.5 pH) from setpoint or when max dosage time (adjustable from 1 to 10 minutes) elapses (isolated, Max 2A-240 V, resistive load, 1,000,000 strokes)

Power Supply

110/115 VAC ±10% or 220/240 VAC ±10%; 50/60 Hz

Environment

-10 to 50°C (14 to 122°F);

RH max 95% non-condensing

Dimensions

221 x 181 x 86 mm (8.7 x 7.1 x 3.4")

Weight

1.6 kg (3.5 lb.)

ORDERING INFORMATION:

HI 9910 is supplied complete with instructions.

a=1, 115 VAC power supply
a=2, 230 VAC power supply

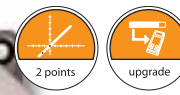
HI 9910-a

ACCESSORIES:

- HI 7004L pH 4.01 buffer solution, 500 mL bottle
- HI 7007L pH 7.01 buffer solution, 500 mL bottle
- HI 7010L pH 10.01 buffer solution, 500 mL bottle
- HI 8427 pH / ORP electrode simulator
- HI 931001 pH / ORP electrode simulator with display

For a complete range of pH electrodes, see pages 63-71

HI 9911 pH Controller with Dual Setpoints



SPECIFICATIONS

Range

0.00 to 14.00 pH

Resolution

0.01 pH

Accuracy (@20°C/68°F)

±0.02 pH

Input Impedance

10¹² Ohm

Calibration

manual, 2 point, through trimmers on the front panel

Temperature Compensation

automatic from 0 to 50°C with Pt100 probe or manual from -10 to 80°C

Setpoint

2, selectable from 0.00 to 14.00 pH

Recorder Output

selectable at 0-20 mA or 4-20 mA (isolated)

Proportional Control

adjustable from 0.0 to 2.0 pH and time cycle from 0 to 90 seconds

Dosing Contact

2 powered terminals for pH correction (115 or 240 V) Max. 2A, 1,000,000 strokes; acid dosage activated when pH > setpoint; alkaline dosage activated when pH < setpoint

Alarm Relay

1, activated when pH varies more than a selectable value (0.5 to 2.5 pH) from setpoint or when max dosage time (adjustable from 1 to 10 minutes) elapses (isolated, Max 2A-240 V, resistive load, 1,000,000 strokes)

Power Supply

110/115 VAC ±10% or 220/240 VAC ±10%; 50/60 Hz

Environment

-10 to 50°C (14 to 122°F);
RH max 95% non-condensing

Dimensions

221 x 181 x 86 mm (8.7 x 7.1 x 3.4")

Weight

1.6 kg (3.5 lb.)



HI 9911 is a pH controller with two setpoints for proportional dosage of acidic and alkaline solutions. Through two sets of coarse and fine trimmers, the setpoints can be accurately fine tuned to any value in the 0.00 to 14.00 range. Likewise, two trimmers on the front panel allow for easy calibration.

HI 9911 accepts any pH electrode ending in a BNC connector. The proportional control can be adjusted to match your application through the time cycle from 0 to 90 seconds and the proportional band of 0 to 2 pH. Two pumps or valves can be wired directly to the controller and be powered through the terminals.

HI 9911 provides for two types of alarms. The alarm relay is activated when the measurements are away from the setpoints by more than a predetermined value in the 0.5 to 2.5 pH range. Or alternatively, when one of the two independently adjustable maximum dosing times is exceeded. The alarm can be configured in either normally-closed or normally-open state and turned off during maintenance.

HI 9911 also provides for a user selectable 0-20 or 4-20 mA isolated recorder output. You can choose from manual or automatic temperature compensation with an optional 3-wire Pt100 probe. HI 9911 comes with extractable terminal modules. Once wired, the compartment containing the connections is closed behind a fire-retardant ABS removable panel. As with HI 9910, a ground probe can be hooked up to the controller to eliminate interference.

ORDERING INFORMATION:

HI 9911 is supplied complete with instructions.

a=1, 115 VAC power supply
a=2, 230 VAC power supply

HI 9911-a

ACCESSORIES:

- HI 7004L pH 4.01 buffer solution, 500 mL bottle
- HI 7007L pH 7.01 buffer solution, 500 mL bottle
- HI 7010L pH 10.01 buffer solution, 500 mL bottle
- HI 8427 pH / ORP electrode simulator
- HI 931001 pH / ORP electrode simulator with display

For a complete range of pH electrodes, see pages 63-71

HI 9912 pH and ORP Controller



HI 9912 is a 2-in-1 pH and ORP controller specially designed for pool control. Two separate setpoints can be user-adjusted from 6 to 8 pH and 500 to 900 mV. The relays are activated when the pH exceeds or the mV falls below the relevant setpoint.

HI 9912 accepts any pH and ORP electrode ending in a universal BNC connector. Two independent terminals provide for pH and ORP ground probes to eliminate interference and prolong the electrodes' lives.

HANNA instruments® proportional control allows considerable savings by minimizing the use of chemicals. The settings are made through independent time cycles adjustable from 0 to 90 seconds and two proportional bands from 0 to 200 mV and 0 to 2 pH. Two pumps or electrovalves can be wired directly to the controller and be powered through the terminal.

HI 9912's alarm is activated when measurements exceed the operator adjustable thresholds of 50 to 250 mV or 0.5 to 2.5 pH. Should the two max. dosing periods of 1 to 10 minutes be exceeded an alarm is activated to signal the abnormality. The alarm is alterable in a normally-closed or a normally-open state and can be turned off during maintenance. Pools status can be ascertained from a distance through dosage and alarm LED's.

HI 9912 comes with extractable terminal modules for quicker and safer wiring. The wiring compartment is protected behind a fire-retardant ABS removable panel.

ORDERING INFORMATION:

HI 9912 is supplied complete with instructions.

a=1, 115VAC power supply
a=2, 230VAC power supply

HI 9912-a

ACCESSORIES:

- HI 7004/1L pH 4.01 buffer solution, 1 L bottle
- HI 7007/1L pH 7.01 buffer solution, 1 L bottle
- HI 7010/1L pH 10.01 buffer solution, 1 L bottle
- HI 7020L 200-275 mV test solution, 500 mL bottle
- HI 7021L 240 mV test solution, 500 mL bottle
- HI 7022L 475 mV test solution, 500 mL bottle
- HI 8427 pH/ORP electrode simulator
- HI 931001 pH/ORP electrode simulator with display

For a complete range of pH electrodes, see pages 63-71

SPECIFICATIONS

Range

0.00 to 14.00 pH; 0 to 1000 mV

Resolution

0.01 pH; 1 mV

Accuracy (@20°C/68°F)

±0.02 pH; ±5 mV

Input Impedance

10¹² Ohm

Calibration

manual, 2 point for pH and 1 point for ORP, through trimmers on the front panel

Setpoint

2, selectable from 6.00 to 8.00 pH and from 500 to 900 mV

Proportional Control

adjustable from 0 to 2 pH and from 0 to 200 mV, time cycles from 0 to 90 seconds

Dosing Contact

2, powered terminal for pH and ORP corrections (240V) Max. 2A, 1,000,000 strokes

pH dosage:

activated when pH > setpoint;

ORP dosage: activated when mV < setpoint

Alarm Relay

1, activated when pH varies more than a selectable value (0.5 to 2.5 pH) from setpoint or when max dosage time for pH (adjustable from 1 to 10 minutes) elapses; or activated when mV reading varies more than a selectable value (50 to 250 mV) from setpoint or when max dosage time for ORP (adjustable from 1 to 10 minutes) elapses (isolated, Max 2A-240 V, resistive load, 1,000,000 strokes)

Power Supply

110/115 VAC ±10% or 220/240 VAC ±10%; 50/60 Hz

Environment

-10 to 50°C (14 to 122°F);

RH max 95% non-condensing

Dimensions

221 x 181 x 86 mm (8.7 x 7.1 x 3.4")

Weight

1.6 kg (3.5 lb.)

HI 9913 pH and Conductivity Controller

SPECIFICATIONS

Range

0.00 to 14.00 pH; 0.00 to 10.00 mS/cm

Resolution

0.01 pH; 0.01 mS/cm

Accuracy (@20°C/68°F)

±0.02 pH; ±2% F.S.

Input Impedance

10¹² Ohm

Calibration

manual, 2 point for pH and 2 point for EC, through trimmers on the front panel

Setpoint

2, selectable from 4.00 to 7.00 pH and from 0.00 to 6.00 mS/cm

Temperature Compensation

(EC) automatic, 0 to 50°C (32 to 122°F) with $\beta=2\%/^{\circ}\text{C}$

Proportional Control

adjustable from 0.00 to 2.00 pH and from 0.00 to 2.00 mS/cm, time cycles from 0 to 90 seconds

Dosing Contact

2 powered terminals for pH and EC dosages (240V) Max. 2A, 1,000,000 strokes activated when pH > setpoint and when mS reading < setpoint, respectively

Alarm Relay

1, activated when pH varies more than a selectable value (0.5 to 2.5 pH) from setpoint or when max dosage time for pH (adjustable from 1 to 10 minutes) elapses; or when conductivity varies more than a selectable value (0.5 to 2.5 mS/cm) from setpoint or when max dosage time for EC (adjustable from 1 to 10 minutes) elapses (isolated, Max 2A-240 V, resistive load, 1,000,000 strokes)

Power Supply

110/115 VAC ±10% or 220/240 VAC ±10%; 50/60 Hz

Environment

-10 to 50°C (14 to 122°F);
RH max 95% non-condensing

Dimensions

221 x 181 x 86 mm (8.7 x 7.1 x 3.4")

Weight

1.6 kg (3.5 lb.)



HI 9913 measures pH from 0 to 14 and EC from 0 to 10 mS/cm. Two separate setpoints can be user-adjusted from 4 to 7 pH and 0 to 6 mS/cm. The relays are activated when pH exceeds the setpoint or conductivity falls below the desired value. Two pumps or electro-valves can be wired directly to the controller and be powered through the terminals. The operator can adjust two independent proportional settings for pH and conductivity. The time cycle is adjustable from 0 to 90 seconds, while the proportional band is 0 to 2 for both pH and EC. A ground probe can be connected to the appropriate terminals to eliminate interference and prolong the pH electrodes' life.

HI 9913 provides for an alarm relay which is activated in several circumstances. These include when the pH is below the setpoint by the operator-adjustable threshold of 0.5 to 2.5 pH, or EC exceeds the setpoint by a value in the 0.5 to 2.5 mS/cm range. The alarm goes off if the pH and/or conductivity are not corrected within the operator-determined time frame of 1 to 10 minutes. The alarm can be turned off during maintenance.

HI 9913 accepts pH electrodes with a BNC and a conductivity probe with a DIN connector. HI 9913 compensates for the temperature effect on conductivity measurements automatically.

ORDERING INFORMATION:

HI 9913 is supplied complete with instructions.

a=1, 115 VAC power supply
a=2, 230 VAC power supply

HI 9913-a

ACCESSORIES:

- HI 7004/1L pH 4.01 buffer solution, 1 L bottle
- HI 7007/1L pH 7.01 buffer solution, 1 L bottle
- HI 7031L 1413 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle
- HI 7039L 5000 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle
- HI 8427 pH/ORP electrode simulator
- HI 931001 pH/ORP electrode simulator with display

For a complete range of pH and EC electrodes, see pages 63-73

HI 9920 ORP Controller with Single Setpoint



HI 9920 is an ORP controller with a single setpoint for user-selectable dosage of reducing or oxidizing solutions. Any ORP electrode ending in a BNC connector can be directly attached to the controller. With proportional control, you can fine tune your treatment plant and minimize the use of chemicals. The proportional setting can be adjusted through the time cycle from 0 to 90 seconds and the band from 0 to 200 mV. The setpoint can be accurately adjusted through coarse and fine trimmers. A pump or electro-valve can be wired directly to the controller and be powered through the terminal.

In addition to the setpoint relay, HI 9920 also provides for an alarm relay. The alarm is activated when the measurements exceed the operator-adjustable threshold of 50 to 250 mV. For extra security, a maximum dosing time from 1 to 10 minutes can also be set, after which the alarm is activated to signal an abnormality. The alarm configuration is alterable in a normally-closed or a normally-open state to accommodate fail-safe installations. Any recorder accepting a 0-20 or 4-20 mA output can also be hooked up to the controller. One can see the controller's status, even from a distance, by observing the dosage or alarm LED's.

To speed up wiring, HI 9920 comes with extractable terminal modules. Once wired up, the compartment containing the connections is protected behind a fire-retardant ABS removable panel. HI 9920 also provides for a ground probe to eliminate interference and prolong the electrode's life.

ORDERING INFORMATION:

HI 9920 is supplied complete with instructions.

a=1, 115 VAC power supply
a=2, 230 VAC power supply

HI 9920-a

ACCESSORIES:

- HI 7020L 200-275 mV test solution, 500 mL bottle
- HI 7021L 240 mV test solution, 500 mL bottle
- HI 7022L 475 mV test solution, 500 mL bottle
- HI 7091L Reducing solution, 500 mL bottle
- HI 7092L Oxidizing solution, 500 mL bottle
- HI 8427 pH/ORP electrode simulator
- HI 931001 pH/ORP electrode simulator with display

For a complete range of ORP electrodes, see pages 63-71

SPECIFICATIONS

Range

-500 to +1500 mV

Resolution

1 mV

Accuracy (@20°C/68°F)

±5 mV

Input Impedance

10¹² Ohm

Calibration

manual, 1 point, through trimmer on the front panel

Recorder Output

selectable at 0-20 mA or 4-20 mA (isolated)

Setpoint

selectable from -500 to +1500 mV

Proportional Control

adjustable from 0 to 200 mV and time cycle from 0 to 90 seconds

Dosing Contact

1 powered terminal for ORP correction (115 or 240 V) Max. 2A, 1,000,000 strokes; activated when mV reading > setpoint for reducing dosage or when mV reading < setpoint for oxidizing dosage

Alarm Relay

1, activated when mV reading varies more than a selectable value (50 to 250 mV) from setpoint or when max dosage time (adjustable from 1 to 10 minutes) elapses (isolated, Max 2A-240 V, resistive load, 1,000,000 strokes)

Power Supply

110/115 VAC ±10% or 220/240 VAC ±10%; 50/60 Hz

Environment

-10 to 50°C (14 to 122°F);
RH max 95% non-condensing

Dimensions

221 x 181 x 86 mm (8.7 x 7.1 x 3.4")

Weight

1.6 kg (3.5 lb.)

HI 9923 pH and Conductivity Controller

SPECIFICATIONS

Range

0.00 to 14.00 pH; 0.00 to 10.00 mS/cm

Resolution

0.01 pH; 0.01 mS/cm

Accuracy (@20°C/68°F)

±0.02 pH; ±2% F.S.

Input Impedance

10¹² Ohm

Calibration

manual, 2 point for pH and 2 point for conductivity, with trimmers on the front panel

Hysteresis

(EC) adjustable from 0 to 0.5 mS/cm

Setpoint

2, selectable from 5.00 to 10.0 pH and from 1.00 to 6.00 mS/cm

Temperature Compensation

(EC) automatic, 0 to 50°C (32 to 1226F) with $\beta=2\%/^{\circ}\text{C}$

Dosing Contact

2 powered terminals for pH (alkaline dosage) and EC corrections (240 V, Max. 2A, 1,000,000 strokes)

Alarm Relay

1, activated when pH falls below the setpoint more than a selectable value (0.5 to 2.5 pH) or when max dosage time for pH (adjustable from 1 to 10 minutes) elapses; or when EC reading exceeds the setpoint more than a selectable value (0.5 to 2.5 mS/cm) or when max dosage time for EC (adjustable from 1 to 10 minutes) elapses (isolated, Max 2A-240 V, resistive load, 1,000,000 strokes)

Power Supply

110/115 VAC ±10% or 220/240 VAC ±10%; 50/60 Hz

Environment

-10 to 50°C (14 to 122°F); RH max 95% non-condensing

Dimensions

221 x 181 x 86 mm (8.7 x 7.1 x 3.4")

Weight

1.6 kg (3.5 lb.)



HI 9923 is a 2-in-1 pH and conductivity controller engineered for monitoring of industrial boilers and cooling towers. Two separate setpoints can be adjusted from 5 to 10 pH and 1 to 6 mS/cm to activate independent relays. Two pumps or electro-valves can be wired directly to the controller and be powered through the terminals. For optimum control, the operator can set the Dead Band (hysteresis) from 0 to 0.5 mS/cm. Trimmers for the pH and conductivity are positioned on the front panel make for easy calibration. A ground probe can be connected to the appropriate terminals to prolong the pH electrode's life.

HI 9923 provides for an alarm relay which is activated when pH falls below the setpoint by the operator-adjustable threshold of 0.5 to 2.5 pH, or conductivity exceeds the setpoint by a value in the 0.5 to 2.5 mS/cm range. The alarm is activated also if the pH and/or conductivity are not corrected within the operator-determined time frame of 1 to 90 minutes. The boiler and cooling towers' status can be ascertained from a distance with dosage and alarm LED's. This 2-in-1 controller accepts pH electrodes with a BNC connector and a conductivity probe with a DIN connector incorporating a temperature sensor. The HI 9923 compensates for the temperature effect of conductivity measurements automatically.

ORDERING INFORMATION:

HI 9923 is supplied complete with instructions.

a=1, 115 VAC power supply
a=2, 230 VAC power supply

HI 9923-a

ACCESSORIES:

- HI 7004/1L pH 4.01 buffer solution, 1 L bottle
- HI 7007/1L pH 7.01 buffer solution, 1 L bottle
- HI 7031L 1413 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle
- HI 7039L 5000 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle
- HI 8427 pH/ORP electrode simulator
- HI 931001 pH/ORP electrode simulator with display

For a complete range of pH and conductivity electrodes, see pages 63-73

HI 9931 EC Controller



HI 9931 is a wall mounted meter that measures and controls conductivity in the 0 to 10 mS/cm range. A single setpoint allows for proportional dosing of fertilizer solutions. The proportional settings can be fine tuned through two conveniently positioned dials on the front panel. The time cycle is adjustable from 0 to 90 seconds and the proportional band from 0 to 1.6 mS/cm. Coarse, fine and slope trimmers make accurate setting and calibration easy and convenient. A pump or electrovalve can be wired directly to the controller and be powered through the terminals.

HI 9931 also provides for an alarm relay which is activated when the measurements exceed the setpoint by a user-selectable margin from 0.5 to 2.5 mS/cm. The alarm also goes off if due to a malfunction, the continuous dosing time exceeds the operator adjustable period of 1 to 10 minutes. The alarm can be configured in either normally closed or open position and turned off during maintenance. HI 9931 also provides an isolated output signal which is user selectable between 0-20 or 4-20 mA.

HANNA instruments® 4-ring conductivity probes ending in a DIN connector can be quickly attached to the controller. Readings are automatically compensated for temperature variations in the 0 to 50°C (32 to 122°F) range. For quick and easy wiring, HI 9931 comes with extractable terminal modules. Several LED's show whether the setpoint or alarm relays have been activated.

SPECIFICATIONS

Range

0.00 to 10.00 mS/cm

Resolution

0.01 mS/cm

Accuracy (@20°C/68°F)

±2% F.S.

Calibration

manual, 2 point, with zero and slope trimmers on the front panel

Setpoint

selectable from 0.00 to 10.00 mS/cm

Temperature Compensationautomatic, 0 to 50°C (32 to 122°F)
with $\beta = 2\%/^{\circ}\text{C}$ **Recorder Output**

selectable at 0-20 mA or 4-20 mA (isolated)

Proportional Control

adjustable from 0.0 to 1.6 mS/cm, time cycle from 0 to 90 seconds

Dosing Contact

1 powered terminal for EC correction (240 V, Max. 2A, 1,000,000 strokes) activated when reading < setpoint

Alarm Relay

1, activated when EC differs more than a selectable value (0.5 to 2.5 mS/cm) from setpoint or when max dosage time (adjustable from 1 to 10 minutes) elapses (isolated, Max 2A-240 V, resistive load, 1,000,000 strokes)

Power Supply

110/115 VAC ±10% or 220/240 VAC ±10%; 50/60 Hz

Environment-10 to 50°C (14 to 122°F);
RH max 95% non-condensing**Dimensions**

221 x 181 x 86 mm (8.7 x 7.1 x 3.4")

Weight

1.6 kg (3.5 lb.)

ORDERING INFORMATION:

HI 9931 is supplied complete with instructions.

a=1, 115 VAC power supply
a=2, 230 VAC power supply

ACCESSORIES:

HI 7031L 1413 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle
HI 7039L 5000 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle

For a complete range of conductivity probes, see pages 72-73

HI 9931-a

HI 9935 pH and TDS Controller

SPECIFICATIONS

Range

0.00 to 14.00 pH; 0 to 1999 ppm (mg/L)

Resolution

0.01 pH; 1 ppm (mg/L)

Accuracy (@20°C/68°F)

±0.02 pH; ±2% F.S.

Input Impedance

10¹² Ohm

Calibration

manual, 2 point for pH and 2 point for TDS, with trimmers on the front panel

Setpoint

2, selectable from 4.00 to 7.00 pH and from 900 to 1800 ppm

TDS Conversion Factor

0.65 ppm = 1 µS/cm

Temperature Compensation

(TDS) automatic, 0 to 50°C (32 to 122°F) with $\beta = 2\%/^{\circ}\text{C}$

Proportional Control

adjustable from 0.00 to 2.00 pH and from 0 to 400 ppm, time cycles from 0 to 90 seconds

Dosing Contact

2 powered terminals for pH and TDS corrections (240 V) Max. 2A, 1,000,000 strokes activated when pH > setpoint and TDS reading < setpoint, respectively

Alarm Relay

1, activated when pH varies more than a selectable value (0.5 to 2.5 pH) from setpoint or when max dosage time for pH (adjustable from 1 to 10 minutes) elapses; or when TDS differs more than a selectable value (50 to 450 ppm) from setpoint or when max dosage time for TDS (adjustable from 1 to 10 minutes) elapses (isolated, Max 2A-240 V, resistive load, 1,000,000 strokes)

Power Supply

110/115 VAC ±10% or 220/240 VAC ±10%; 50/60 Hz

Environment

-10 to 50°C (14 to 122°F);
RH max 95% non-condensing

Dimensions

221 x 181 x 86 mm (8.7 x 7.1 x 3.4")

Weight

1.6 kg (3.5 lb.)



HI 9935 measures pH from 0 to 14 and TDS from 0 to 1999 ppm. Two separate setpoints can be user-adjusted from 4 to 7 pH and 900 to 1800 ppm (mg/L). The relays are activated when pH exceeds the setpoint or TDS falls below the desired value. Two pumps or electro-valves can be wired directly to the controller and be powered through the terminals. Independent proportional settings for pH and TDS can be adjusted from 0 to 90 seconds, 0 to 2.0 for pH and 0 to 400 ppm for TDS. A ground probe can be connected to the appropriate terminals to eliminate interference and prolong the pH electrodes' life.

HI 9935 provides for an alarm relay which is activated in several circumstances. These include when the pH is below the setpoints in the operator-adjustable threshold of 0.5 to 2.5 pH, or similarly, TDS exceeding the setpoint by a value in the 50 to 450 ppm range. The alarm also goes off if the pH and/or TDS are not corrected within the operator-determined time frame of 1 to 10 minutes. Moreover, the alarm configuration is switchable from a normally-closed to a normally-open state or turned off during maintenance. The fertilization status can be ascertained from a distance through dosage and alarm LED's.

HI 9935 automatically compensates for the temperature effect on TDS. It accepts pH electrodes with a BNC connector and a TDS probe with a DIN connector incorporating a temperature sensor.

ORDERING INFORMATION:

HI 9935 is supplied complete with instructions.

a=1, 115VAC power supply

a=2, 230VAC power supply

HI 9935-a

ACCESSORIES:

HI 7004/1L pH 4.01 buffer solution, 1 L bottle

HI 7007/1L pH 7.01 buffer solution, 1 L bottle

HI 70442L 1500 ppm calibration solution, 500 mL bottle

HI 8427 pH / ORP electrode simulator

HI 931001 pH / ORP electrode simulator with display

For a complete range of pH and TDS probes, see pages 63-73

Analog Process Controllers

HANNA instruments® panel mounted pH, ORP and conductivity controllers are designed to meet your most demanding process control requirements. Our controllers come equipped with a power relay operating at a maximum of 2 A (240V).

Where a direct electrode input is not suitable, the controller is available with a 4-20 mA input from the amplifier. This feature greatly improves the safety of your instrumentation and plant. Accurate measurements are displayed on a large LCD, enabling the operator to check the controller readings easily.

These units have sophisticated, built-in self-diagnostic functions that allow the operator to check whether a malfunction has originated in the instrument itself, or in the outside connection (electrode, transmitter or cables). This saves valuable time and money, particularly in the monitoring of critical processes. In the event of a malfunction, the operator can determine the origin and rectify the situation before any costly errors occur. This Self-Diagnostic Error Prevention System makes the HANNA instruments® process meters superior to conventional controllers.

Alarm Feature

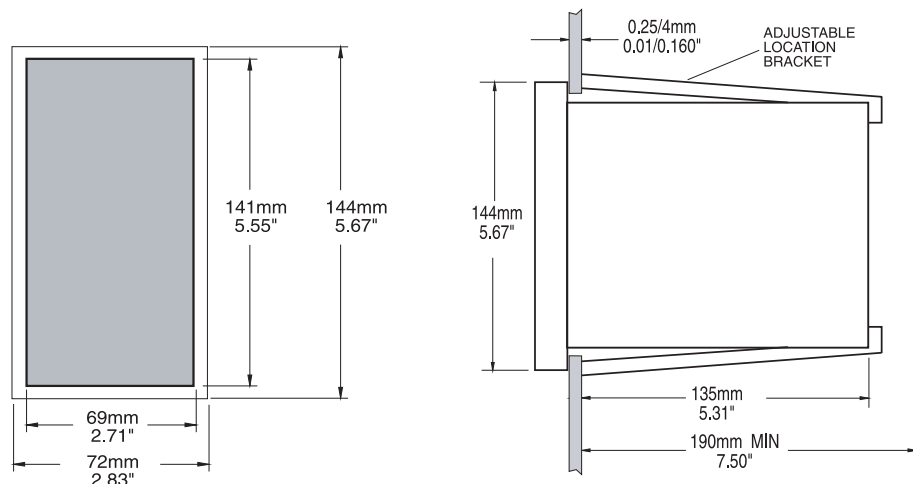
HANNA instruments® controllers incorporate an alarm warning system. When the measured value of the meter is out of the user-specified range, the alarm is activated. When activated, the alarm contacts close, triggering the mechanism of your choice, whether a buzzer, light or any other electrical connection. The alarm feature is a necessity when the installation is in a remote location and corrective action must be taken immediately in the event of an out-of-range condition.

Recorder Output

The ability to record data from the process you are monitoring greatly enhances process troubleshooting. By simply connecting a recorder to the controller's output terminals (choose between 0 to 20 mA or 4 to 20 mA according to your needs), you are able to acquire a hard copy for demonstrative or analytical purposes.

Low or High Impedance Input

HANNA instruments® pH and ORP controllers come in two different models to meet all requirements. The E model, has a high impedance 10^{12} Ohm direct input from an electrode, ideal for connections with a distance of up to 10 meters (33 feet). The T model, however, is recommended for distances greater than 10 m (33') and should be used with a 4 to 20 mA transmitter. The greater the distance between the controller and the sample, the greater the chance you have of line noise causing erroneous readings. Using a transmitter greatly enhances the input signal, thus allowing high accuracy at distances of up to 300 m (1000').



Consent Feature

The consent contact allows you to be sure that the ORP dosing occurs only when the pH value is correct. This assures that the pH is within a specified range before any dosing of oxidizing or reducing agents occurs. This will prevent any overdosing of chemicals, a very important cost-effective feature in many applications, especially in pools, spas and hot tubs.

Quality Construction

The controllers are housed in sturdy aluminum casings with ABS plastic front panels. The mounting brackets that are supplied with the meter, can be installed securely and quickly.

When in operation, and with the transparent protective cover installed, the units comply with IP42 standards. The use of this design protects the unit from the conditions associated with industrial environments, ensuring long and trouble-free operation.

LED Indicators

The LEDs on the front panel light up to indicate the correct operational mode. The LEDs also blink at different rates to indicate multiple modes occurring simultaneously. This feature allows the user to evaluate the controller from a distance and clearly read which mode it is in.

HI 8510 pH Indicator

SPECIFICATIONS

Range

0.00 to 14.00 pH

Resolution

0.01 pH

Accuracy (@20°C/68°F)

HI 8510E: ±0.02 pH

HI 8510T: ±0.5%

Input

HI 8510E: high impedance 10¹² Ohm

HI 8510T: 4-20 mA

Calibration

offset: ±2 pH with Δ0 trimmer;

slope: 80 to 110% with slope trimmer

Temperature Compensation

fixed or automatic with Pt100,

from 0 to 100°C (32 to 212°F)

Recorder Output

0-20 mA or 4-20 mA (isolated)

Power Supply

115/230 ±10% VAC; 50/60 Hz

Enclosure

black anodized aluminum body; front and back with ABS; transparent splash-proof front cover

Environment

-10 to 50°C (14 to 122°F);

RH max 95% non-condensing

Panel Cutout

141 x 69 mm (5.6 x 2.7")

Weight

1 kg (2.2 lb.)



- Ideal for constant monitoring
- Accurate measurements from 0.00 to 14.00 pH with 0.01 pH resolution
- Designed for easy installation
- Auto-diagnostic tests for pH electrode and instrument status
- Two models to accept direct input from pH electrode or pH transmitter
- Operational mode LED indicators

This instrument is ideal for monitoring pH in process control. It can provide accurate pH measurements and display values on the easy-to-read LCD, ranging from 0 to 14 pH, with 0.01 resolution.

This indicator has been designed for easy and fast installation (mounting brackets are included). It is provided with a unique self-diagnostic test to check the pH electrode and instrument status. Two different versions are available to accept either a direct input from a pH electrode (E version) or from a transmitter through 4-20 mA input (T version). The output configuration for connecting a recorder or a PLC can be chosen between 0-20 or 4-20 mA.

The front panel is protected behind a transparent splash-proof cover.

ORDERING INFORMATION:

The HI 8510 series is supplied complete with mounting brackets and instructions.

Input from electrode

HI 8510E020 with 0-20 mA recorder output

HI 8510E420 with 4-20 mA recorder output

Input from transmitter

HI 8510T020 with 0-20 mA recorder output

HI 8510T420 with 4-20 mA recorder output

ACCESSORIES:

HI 7004/1L pH 4.01 buffer solution, 1 L bottle

HI 7007/1L pH 7.01 buffer solution, 1 L bottle

HI 7010/1L pH 10.01 buffer solution, 1 L bottle

HI 8427 pH / ORP electrode simulator

HI 931001 pH / ORP electrode simulator with display

HI 8510T only

HI 8614 pH transmitter

HI 8614L pH transmitter with display

For a complete range of pH electrodes, see pages 63-71

HI 8710 pH Controller



- Single setpoint with selection of acid or alkaline dosage
- User-selectable alarm band
- Use in conjunction with HI 8720 for ORP dosage at correct pH levels
- Auto-diagnostic test for instrument status troubleshooting
- Two models to accept direct input from pH electrode or pH transmitter
- Operational mode LED indicators

This instrument allows the selection of a setpoint for acid or alkaline dosage. Users can also set the tolerance of the setpoint (0.1 to 3 pH), before an alarm is activated.

When used in conjunction with the HI 8720 ORP controller, the ODCD* function will ensure that the ORP dosage will start only when the pH level is correct. Two different versions are available to accept either a direct input from a pH electrode (E version) or from a transmitter through 4-20 mA input (T version). The output configuration for connecting a recorder or a PLC can be chosen between 0-20 or 4-20 mA.

The controller is also provided with a unique self-diagnostic test to check the pH electrode and instrument status and the front panel is protected behind a transparent splash-proof cover.

* ORP Dosing Consent Device

ORDERING INFORMATION:

The HI 8710 series is supplied complete with mounting brackets and instructions.

Input from electrode

HI 8710E020 with 0-20 mA recorder output
HI 8710E420 with 4-20 mA recorder output

Input from transmitter

HI 8710T020 with 0-20 mA recorder output
HI 8710T420 with 4-20 mA recorder output

ACCESSORIES:

HI 7004/1L pH 4.01 buffer solution, 1 L bottle
HI 7007/1L pH 7.01 buffer solution, 1 L bottle
HI 7010/1L pH 10.01 buffer solution, 1 L bottle
HI 8427 pH / ORP electrode simulator
HI 931001 pH / ORP electrode simulator with display

HI 8710T only

HI 8614 pH transmitter
HI 8614L pH transmitter with display

For a complete range of pH electrodes, see pages 63-71

SPECIFICATIONS

Range

0.00 to 14.00 pH

Resolution

0.01 pH

Accuracy (@20°C/68°F)

HI 8710E: ±0.02 pH

HI 8710T: ±0.5%

Input

HI 8710E: high impedance 10¹² Ohm

HI 8710T: 4-20 mA

Calibration

offset: ±2 pH with Δ0 trimmer;

slope: 80 to 110% with slope trimmer

Temperature Compensation

fixed or automatic with Pt100, from 0 to 100°C (32 to 212°F)

Recorder Output

0-20 mA or 4-20 mA (isolated)

Setpoint Relay

1, isolated, 2A, Max. 240 V, resistive load, 1,000,000 strokes

Alarm Relay

1, isolated, 2A, Max. 240 V, resistive load, 1,000,000 strokes

Power Supply

115/230 ±10% VAC; 50/60 Hz

Enclosure

black anodized aluminum body; front and back with ABS; transparent splash-proof front cover

Environment

-10 to 50°C (14 to 122°F);

RH max 95% non-condensing

Panel Cutout

141 x 69 mm (5.6 x 2.7")

Weight

1 kg (2.2 lb.)

HI 8711 Dual Output pH Controller

SPECIFICATIONS

Range

0.00 to 14.00 pH

Resolution

0.01 pH

Accuracy (@20°C/68°F)

HI 8711E: ±0.02 pH

HI 8711T: ±0.5%

Input

HI 8711E: high impedance 10¹² Ohm

HI 8711T: 4-20 mA

Calibration

offset: ±2 pH with Δ0 trimmer;

slope: 80 to 110% with slope trimmer

Temperature Compensation

fixed or automatic with Pt100,
from 0 to 100°C (32 to 212°F)

Recorder Output

0-20 mA or 4-20 mA (isolated)

Setpoint Relay

2, isolated, 2A, Max. 240 V, resistive load,
1,000,000 strokes

Alarm Relay

1, isolated, 2A, Max. 240 V, resistive load,
1,000,000 strokes

Power Supply

115/230 ±10% VAC; 50/60 Hz

Enclosure

black anodized aluminum body; front and back
with ABS; transparent splash-proof front cover

Environment

-10 to 50°C (14 to 122°F);
RH max 95% non-condensing

Panel Cutout

141 x 69 mm (5.6 x 2.7")

Weight

1 kg (2.2 lb.)



- Dual setpoint with two independent dosing outputs
- Auto-diagnostics to verify offset and slope calibration and electrode contamination/deterioration
- User-selectable alarm band
- Two models to accept direct input from electrode or transmitter
- Operational mode LED indicators

This instrument allows the selection of two setpoints with two independent outputs for acid and alkaline dosages. The self-diagnostic features verify the calibration values (offset and slope) and the electrode status.

The alarm interval can be set to activate the alarm when the measured value differs from the setpoint more than the selected tolerance (0.1 to 3 pH).

Two versions are available: HI 8711E with direct input signal from a pH electrode and HI 8711T with analog input from a transmitter. The output configuration for connecting a recorder or a PLC can be chosen between 0-20 or 4-20 mA.

The front panel is protected behind a transparent splash-proof cover.

ORDERING INFORMATION:

The HI 8711 series is supplied complete with mounting brackets and instructions.

Input from electrode

HI 8711E020 with 0-20 mA recorder output

HI 8711E420 with 4-20 mA recorder output

Input from transmitter

HI 8711T020 with 0-20 mA recorder output

HI 8711T420 with 4-20 mA recorder output

ACCESSORIES:

HI 7004/1L pH 4.01 buffer solution, 1 L bottle

HI 7007/1L pH 7.01 buffer solution, 1 L bottle

HI 7010/1L pH 10.01 buffer solution, 1 L bottle

HI 8427 pH / ORP electrode simulator

HI 931001 pH / ORP electrode simulator
with display

HI 8711T only

HI 8614 pH transmitter

HI 8614L pH transmitter with display

For a complete range of pH electrodes, see pages 63-71

HI 8512 ORP Indicator



- Consistent ORP Monitoring
- Easy to install
- Built-in auto-diagnostic tests
- Two models to accept direct input from electrode or transmitter
- Operational mode LED indicators
- Transparent splash-proof cover included

This instrument measures and displays the process ORP value in the range from -1000 to +1000 mV. The indicator can be easily panel mounted, thanks to the supplied adjusting brackets.

Two different versions are available to accept either a direct input from an ORP electrode (E version) or from a transmitter through 4-20 mA input (T version). The output configuration for connecting a recorder or a PLC can be chosen between 0-20 or 4-20 mA.

The front panel is protected behind a transparent splash-proof cover.

ORDERING INFORMATION:

The HI 8512 series is supplied complete with mounting brackets and instructions.

Input from electrode

- HI 8512E020 with 0-20 mA recorder output
- HI 8512E420 with 4-20 mA recorder output

Input from transmitter

- HI 8512T020 with 0-20 mA recorder output
- HI 8512T420 with 4-20 mA recorder output

ACCESSORIES:

- HI 7020L 200-275 mV test solution, 500 mL bottle
- HI 7091L Reducing solution, 500 mL bottle
- HI 7092L Oxidizing solution, 500 mL bottle
- HI 8427 pH / ORP electrode simulator
- HI 931001 pH / ORP electrode simulator with display

HI 8512T only

- HI 8615 ORP transmitter
- HI 8615L ORP transmitter with display

For a complete range of pH electrodes, see pages 63-71

SPECIFICATIONS

Range

-1000 to +1000 mV

Resolution

1 mV

Accuracy (@20°C/68°F)

HI 8514E: ±5 mV

HI 8512T: ±0.5%

Input

HI 8512E: high impedance 10¹² Ohm

HI 8512T: 4-20 mA

Calibration

slope: 90 to 110% with trimmer

Recorder Output

0-20 mA or 4-20 mA (isolated)

Power Supply

115/230 ±10% VAC; 50/60 Hz

Enclosure

black anodized aluminum body; front and back with ABS; transparent splash-proof front cover

Environment

-10 to 50°C (14 to 122°F);

RH max 95% non-condensing

Panel Cutout

141 x 69 mm (5.6 x 2.7")

Weight

1 kg (2.2 lb.)

HI 8720 ORP Controller

SPECIFICATIONS

Range

-1000 to +1000 mV

Resolution

1 mV

Accuracy (@20°C/68°F)

HI 8720E: ±5 mV

HI 8720T: ±0.5%

Input

HI 8720E: high impedance 10^{12} Ohm

HI 8720T: 4-20 mA

Calibration

slope: 90 to 110% with trimmer

Recorder Output

0-20 mA or 4-20 mA (isolated)

Setpoint Relay

1, isolated, 2A, Max. 240 V, resistive load,
1,000,000 strokes

Alarm Relay

1, isolated, 2A, Max. 240 V, resistive load,
1,000,000 strokes

Power Supply

115/230 ±10% VAC; 50/60 Hz

Enclosure

black anodized aluminum body; front and back
with ABS; transparent splash-proof front cover

Environment

-10 to 50°C (14 to 122°F);

RH max 95% non-condensing

Panel Cutout

141 x 69 mm (5.6 x 2.7")

Weight

1 kg (2.2 lb.)



- Single setpoint with selection of reducing or oxidizing dosage
- Automatic diagnostic controls
- User-selectable alarm band
- Use in conjunction with HI 8710 for ORP dosage at correct pH levels
- Two models to accept direct input from electrode or transmitter
- Operational mode LED indicators

This instrument allows the selection of a setpoint for oxidizing or reducing dosage. It is provided with self-diagnostic feature to control the calibration at 0 and 500 mV. The user can also set the tolerance of the setpoint (10 to 200 mV), before an alarm is activated. When used in conjunction with the HI 8710 pH controller, the ODCD* function (featured by the HI 8710) will ensure that the ORP dosage will start only when the pH level is correct. Two different models are available to accept either a direct input from an ORP electrode (E version) or from a transmitter through 4-20 mA input (T version). The output configuration for connecting a recorder or a PLC can be chosen between 0-20 or 4-20 mA.

The front panel is protected behind a transparent splash-proof cover.

* ORP Dosing Consent Device

ORDERING INFORMATION:

The HI 8720 series is supplied complete with mounting brackets and instructions.

Input from electrode

HI 8720E020 with 0-20 mA recorder output

HI 8720E420 with 4-20 mA recorder output

Input from transmitter

HI 8720T020 with 0-20 mA recorder output

HI 8720T420 with 4-20 mA recorder output

ACCESSORIES:

HI 7020L	200-275 mV test solution, 500 mL bottle
HI 7091L	Reducing solution, 500 mL bottle
HI 7092L	Oxidizing solution, 500 mL bottle
HI 8427	pH / ORP electrode simulator
HI 931001	pH / ORP electrode simulator with display

HI 8720T only

HI 8615	ORP transmitter
HI 8615L	ORP transmitter with display

For a complete range of ORP electrodes, see pages 63-71

HI 8931 Conductivity Controller



- Built-in auto-diagnostic function for offset and slope
- Using HI 8931 in conjunction with our HI 8936 transmitter assures strong, interference-free signals up to 1000'
- Available in four models, each with a different measurement range
- Operational mode LED indicators
- Transparent splash-proof cover included

These instruments have to be used in conjunction with the HI 8936 transmitter series (see page 49). Thanks to this installation it is possible to receive a signal without any noise from a distance of up to 300 meters from the measuring point. The dosing type is selectable through a jumper on the rear panel. Four different models are available with different measurement ranges, each one to be used with the corresponding HI 8936 model. The output configuration for connecting a recorder or a PLC can be chosen between 0-20 or 4-20 mA.

The front panel is protected behind a transparent splash-proof cover.

ORDERING INFORMATION:

The HI 8931 series is supplied complete with mounting brackets and instructions.

HI 8931A	0.0 to 199.9 mS/cm
HI 8931B	0.0 to 19.99 mS/cm
HI 8931C	0 to 1999 µS/cm
HI 8931D	0.0 to 199.9 µS/cm

ACCESSORIES:

HI 8936A	Conductivity transmitter for HI 8931A	HI 8936D	Conductivity transmitter for HI 8931D
HI 8936AL	Conductivity transmitter for HI 8931A, with display	HI 8936DL	Conductivity transmitter for HI 8931D, with display
HI 8936B	Conductivity transmitter for HI 8931B	HI 7033L	84 µS/cm calibration solution, 500 mL bottle
HI 8936BL	Conductivity transmitter for HI 8931B, with display	HI 7031L	1413 µS/cm calibration solution, 500 mL bottle
HI 8936C	Conductivity transmitter for HI 8931C	HI 7030L	12880 µS/cm calibration solution, 500 mL bottle
HI 8936CL	Conductivity transmitter for HI 8931C, with display	HI 7034L	80000 µS/cm calibration solution, 500 mL bottle

SPECIFICATIONS

Range

HI 8931A: 0.0 to 199.9 mS/cm
 HI 8931B: 0.00 to 19.99 mS/cm
 HI 8931C: 0 to 1999 µS/cm
 HI 8931D: 0.0 to 199.9 µS/cm

Resolution

HI 8931A: 0.1 mS/cm
 HI 8931B: 0.01 mS/cm
 HI 8931C: 1 µS/cm
 HI 8931D: 0.1 µS/cm

Accuracy (@20°C/68°F)

±2% F.S.

Input from Transmitter

HI 8931A: HI 8936A / AL
 HI 8931B: HI 8936B / BL
 HI 8931C: HI 8936C / CL
 HI 8931D: HI 8936D / DL

Temperature Compensation

see HI 8936 transmitter specifications

Recorder Output

4-20 mA (isolated)

Setpoint Relay

1, isolated, 2A, Max. 240 V, resistive load, 1,000,000 strokes

Alarm Relay

1, isolated, 2A, Max. 240 V, resistive load, 1,000,000 strokes

Power Supply

115/230 ±10% VAC; 50/60 Hz

Enclosure

black anodized aluminum body; front and back with ABS; transparent splash-proof front cover

Environment

-10 to 50°C (14 to 122°F); RH max 95% non-condensing

Panel Cutout

141 x 69 mm (5.6 x 2.7")

Weight

1 kg (2.2 lb.)

HI 943500 Conductivity Analog Controller

SPECIFICATIONS

Range

HI 943500A: 0.0 to 199.9 mS/cm
HI 943500B: 0.00 to 19.99 mS/cm
HI 943500C: 0 to 1999 μ S/cm
HI 943500D: 0.0 to 199.9 μ S/cm

Resolution

HI 943500A: 0.1 mS/cm
HI 943500B: 0.01 mS/cm
HI 943500C: 1 μ S/cm
HI 943500D: 0.1 μ S/cm

Accuracy (@20°C/68°F)

$\pm 2\%$ F.S.

Temperature Compensation

automatic, 0 to 60°C (32 to 140°F),
with $\beta=2\%/^{\circ}\text{C}$

Recorder Output

4-20 mA (isolated)

Setpoint Relay

1, isolated, 2A, Max. 240 V, resistive load,
1,000,000 strokes

Alarm Relay

1, isolated, 2A, Max. 240 V, resistive load,
1,000,000 strokes

Power Supply

115/230 $\pm 10\%$ VAC; 50/60 Hz

Enclosure

black anodized aluminum body; front and back
with ABS; transparent splash-proof front cover

Environment

-10 to 50°C (14 to 122°F);
RH max 95% non-condensing

Panel Cutout

141 x 69 mm (5.6 x 2.7")

Weight

1 kg (2.2 lb.)



- Direct connection of up to 66' without the need for intermediate amplifiers to the HI 7638 probe
- Automatic diagnostic controls
- Available in four models, each with a different measurement range
- Operational mode LED indicators
- Automatic temperature compensation with HI 7638 potentiometric conductivity probe
- Transparent splash-proof cover included

These controllers allow the direct connection of a potentiometric conductivity probe (HI 7638, page 72) with a cable up to 20 meters long, without using any transmitter. Four different models are available with different measurement ranges, to satisfy any application requirements. The output configuration for connecting a recorder or a PLC can be chosen between 0-20 or 4-20 mA. The LED on the front panel indicates the operating status of the controller. The automatic temperature compensation (ATC) is performed directly by the HI 7638 probe with built-in temperature sensor.

The front panel is protected behind a transparent splash-proof cover.

ORDERING INFORMATION:

The HI 943500 series is supplied complete with mounting brackets and instructions.

HI 943500A 0.0 to 199.9 mS/cm
HI 943500B 0.0 to 19.99 mS/cm
HI 943500C 0 to 1999 μ S/cm
HI 943500D 0.0 to 199.9 μ S/cm

ACCESSORIES:

HI 7638 Conductivity probe for immersion
HI 7033L 84 μ S/cm calibration solution, 500 mL bottle
HI 7031L 1413 μ S/cm calibration solution, 500 mL bottle
HI 7030L 12880 μ S/cm calibration solution, 500 mL bottle
HI 7034L 80000 μ S/cm calibration solution, 500 mL bottle

Mini Controllers

Accurate and Simple to Install

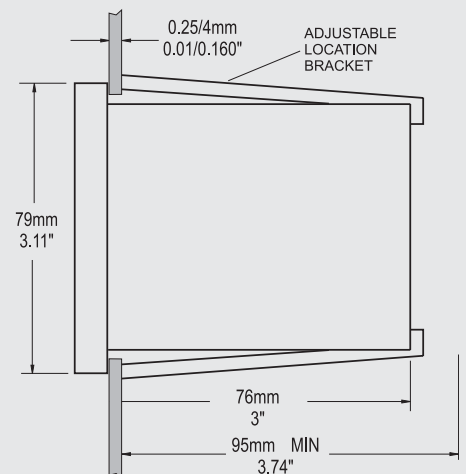
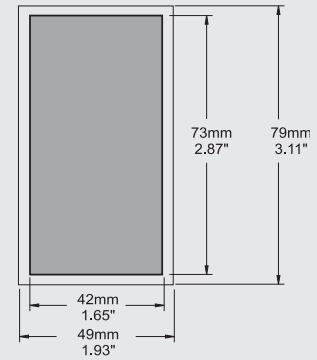
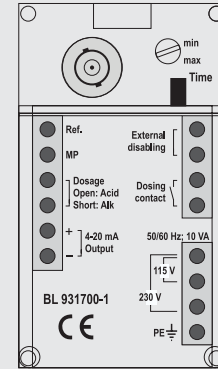
Traditionally, process monitoring has required considerable investment in system design, equipment, maintenance and training. With our mini controllers, we are able to offer a solution for industries that have to monitor a process economically. HANNA instruments® mini controllers are easy to use and allow accurate continuous monitoring and control of pH, ORP, TDS, EC, Resistivity and Level. These compact, in-line instruments are designed to consistently perform in most environments and conditions.

Our line of simple-to-operate controllers have been specially designed for hydroponics, swimming pools or applications where space or cost are a major concern. Thanks to their compact size, they can be mounted in confined spaces and right next to tanks or vats.

The low cost of the meter will also make it possible for processes that up to now were manually maintained to be controlled automatically, saving considerable time and money.

Our redesigned mini controller series features a larger LCD for easy reading, manual output control for simple maintenance, overtime control system and a multi-colored LED to indicate meter condition (measurement, dosing or alarm mode).

Finally, the BL 931700 and BL 932700 models are provided with 4-20 mA analog output and input for remote control disabling.



- Fire retardant casing
- Larger LCD
- Selectable overdose protection system
- External disable feature
- Selectable control override
- Matching pin connection
- 4-20 mA analog output

- 2 amp built-in fuse



- Removable modules for easy maintenance

- Quick-connect terminal blocks

Mini Controllers

pH Mini Controllers

Monitoring and controlling pH in water conditioning and industrial applications is essential for water quality and maintaining infrastructure (piping and equipment). In the case of industrial effluent, neutralization of acidic waste is vital for environmental safety and public health. In industrial applications such as boiler feed water conditioning, a higher pH of 8.5 is necessary to prevent scaling and corrosion of critical components. Maintaining a pH of 7.2 is fundamental for proper and efficient sanitization in swimming pools and spas. The effectiveness of sanitizers such as chlorine is dependent on a controlled pH value.

ORP Mini Controllers

ORP (Oxidation Reduction Potential) is the most dependable and consistent indicator of the sanitizing effectiveness of your pool, spa or treatment water. As oxidizers such as chlorine, peroxide and ozone are added to water for the purpose of sanitization, the ORP value increases, providing a clear indication of the cleansing power of the water. Typically, an ORP value of 650 to 700 mV at a pH of 7.2 indicates that your water is properly treated and all harmful bacteria are killed in less than 1 second. ORP is also essential in chemical processing where reducing agents are used and a negative ORP value is an indicator of proper neutralization.

Conductivity Mini Controllers

In water, an increase in conductivity indicates an increase in water hardness and a decrease in purity. Conductivity monitoring and control is essential in reducing water hardness and maintaining water quality. For instance, water with a conductivity value in the range of 0-140 μS is considered "very soft" where as water with a range of 640-840 μS is considered "hard" water. An increase in conductivity indicates an increase in the amount of damaging dissolved solids (salts) present in water. Conductivity monitoring and control is essential in industrial applications such as feed water control, blow down activation in cooling towers and water management where high conductivity will cause scaling and corrosion of piping and damage to critical components.

TDS Mini Controllers

TDS measurement is an important indicator of water quality. An increase in the TDS reading indicates an increase in the amount of dissolved solids (salts) present in the water. TDS monitoring and control is imperative in industrial applications such as feed water control, blow down activation in cooling towers and water management where high TDS will cause scaling and corrosion of piping and damage to critical components.

TDS measurement is also an important indicator of the effectiveness of water conditioning since an increase in TDS indicates an increase in water hardness and a decrease in purity. This will affect the quality of drinking water, feed water and rinse water. TDS monitoring and control is crucial in reducing water hardness and maintaining water quality and usability.

Resistivity Mini Controller

Resistivity, measured in MW (Ohm's), is the optimal way to measure the quality of water produced by high purity systems such as R.O systems and water conditioning equipment. As filter systems become less effective, the resistivity value will decrease indicating a need for maintenance and/or replacement of filters and critical components. Properly functioning RO and water conditioning systems will consistently produce water with resistivity readings in the range of 16 to 18MW.

BlackStone mini controllers are the perfect solution for water analysis and control

Any system can be cost effectively monitored 24 hours a day



BL 981411 pH Mini Controller

The BL 981411 pH controller has been designed for easy, affordable installation in tight spaces, ideal for simple yet effective process control. The unit is provided with differential pH input and can be used with any pH electrode with standard BNC connector.

Measurements are clearly displayed on the large LCD, while the status LED indicates operating mode. BL 981411 is also provided with a dosing relay. Selecting acid dosing, will cause the relay to activate when measurement is higher than setpoint. If the basic dosing is selected, the relay is activated when the reading falls below the setpoint. Setpoint adjustment (from 0 to 14 pH) and calibration procedures are easily performed with trimmers on the front panel. You can also choose from automatic or manual dosing modes with a switch on the front panel. Manual control is particularly useful during maintenance operations, because it permits you to enable or disable the dosing relay according to your need. An overtime control system advises you when the relay is active for too long, to help prevent overdosing.

Two models are available, with power supply input at 115/230 VAC or 12 VDC.

ORDERING INFORMATION:

BL 981411-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 981411-1 is supplied complete with mounting brackets, transparent cover and instructions.

ACCESSORIES:

- | | |
|------------------|----------------------------------------------|
| HI 7004L | pH 4.01 calibration solution, 500 mL bottle |
| HI 7007L | pH 7.01 calibration solution, 500 mL bottle |
| HI 7010L | pH 10.01 calibration solution, 500 mL bottle |
| HI 70300L | Electrode storage solution, 500 mL bottle |
| HI 7061L | Electrode cleaning solution, 500 mL bottle |
| HI 710005 | 115 VAC/12 VDC power adapter |
| HI 710006 | 230 VAC/12 VDC power adapter |
| HI 740146 | Mounting brackets |

For a complete range of pH electrodes, see pages 63-71

SPECIFICATIONS**Range**

0.0 to 14.0 pH

Resolution

0.1 pH

Accuracy (@20°C/68°F)

±0.1 pH

Calibration

manual, with offset trimmer

Dosing Relay

1, max 2A (fuse protected), 250 VAC, 30 VDC

Dosing Selection

acid or alkaline contact open=acid dosage;
activated when reading exceeds setpoint value
contact closed=alkaline dosage; activated when
reading falls below setpoint value

Setpoint

adjustable from 0.0 to 14.0 pH

Overtime

adjustable, typically from 5 to approx. 30 minutes

Input Impedance

10^{12} Ohm

Power Supply

BL 981411-0: 12 VDC adapter (included)

BL 981411-1: 115/230 VAC; 50/60Hz

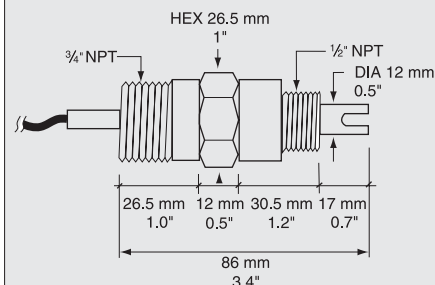
Dimensions

83 x 53 x 99 mm (3.3 x 2.1 x 3.9")

Weight

BL 981411-0: 200 g (7.1 oz.)

BL 981411-1: 300 g (10.6 oz.)



HI 1001 Dimensions

BL 931700 pH Mini Controller



SPECIFICATIONS

Range

0.00 to 14.00 pH

Resolution

0.01 pH

Accuracy (@20°C/68°F)

±0.02 pH

Calibration

manual, 2 point, with offset and slope trimmers

Dosing Relay

1, max 2A (fuse protected), 250 VAC, 30 VDC

Dosing Selection

acid or alkaline contact open=acid dosage;
activated when reading exceeds setpoint value
contact closed=alkaline dosage; activated when
reading falls below setpoint value

Setpoint

adjustable from 0.00 to 14.00 pH

Overtime

adjustable, typically from 5 to approx. 30 minutes

Recorder Output

4-20 mA, accuracy ±0.20 mA, 500 Ohm max load

Input Impedance

10¹² Ohm

Power Supply

BL 931700-0: 12 VDC adapter (included)

BL 931700-1: 115/230 VAC; 50/60Hz

Dimensions

83 x 53 x 99 mm (3.3 x 2.1 x 3.9")

Weight

BL 931700-0: 200 g (7.1 oz.)

BL 931700-1: 300 g (10.6 oz.)



BL 931700 mini pH controller has been designed for easy, affordable installation in tight spaces to perform simple yet effective process control. Thanks to its compact size, BL 931700 can be installed right next to tanks or vats. This versatile controller is ideal for a wide variety of applications, such as textiles, papers, photographic solutions, plating baths, chemicals and water treatment.

BL 931700 is provided with a selectable setpoint for acid or basic dosage. Measurements are directly acquired from a pH electrode in the range from 0 to 14 with a 0.01 pH resolution. Accuracy is ensured by the 2 point calibration, performed manually through trimmers on the front panel. You can also choose automatic or manual dosing mode with a switch on the front panel. Manual control is particularly useful during maintenance operations, because it permits you to enable or disable the dosing relay according to your need. The overtime control system advises you when the relay is active for too long, helping to prevent overdosing.

In addition, this model features a 4-20 mA analog output for recorder connection. Two models are available, with different power supply input at 115/230 VAC or 12 VDC.

ORDERING INFORMATION:

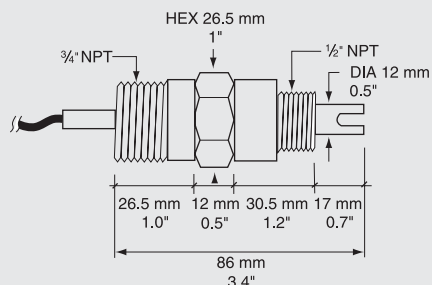
BL 931700-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 931700-1 is supplied complete with mounting brackets, transparent cover and instructions.

ACCESSORIES:

- HI 7004L** pH 4.01 calibration solution, 500 mL bottle
- HI 7007L** pH 7.01 calibration solution, 500 mL bottle
- HI 7010L** pH 10.01 calibration solution, 500 mL bottle
- HI 70300L** Electrode storage solution, 500 mL bottle
- HI 7061L** Electrode cleaning solution, 500 mL bottle
- HI 710005** 115 VAC/12 VDC power adapter
- HI 710006** 230 VAC/12 VDC power adapter
- HI 740146** Mounting brackets

For a complete range of pH electrodes, see pages 63-71



HI 1001 Dimensions

BL 982411 ORP Mini Controller



BL 982411 is an ORP mini controller for panel mounting, specially designed for swimming pools and spas. Thanks to its compact size, BL 982411 can be installed in small spaces. BL 982411 is the ideal solution for those who have always checked ORP manually.

Thanks to the automatic dosing, this mini controller will significantly reduce maintenance time. BL 982411 can be used with any ORP electrode with standard BNC connector. The instrument measures ORP in the 0 to 1000 mV range and shows the readings on the large display. The status LED continuously indicates if the controller is in measurement, dosing or alarm mode.

BL 982411 is also provided with a relay for selecting the dosing direction, oxidizing or reducing. You can also choose automatic or manual dosing mode with a switch on the front panel. Manual control is particularly useful during maintenance operations, because it permits you to enable or disable the dosing relay according to your need. The overtime control system advises you when the relay is active for too long, helping to prevent overdosage.

ORDERING INFORMATION:

BL 982411-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 982411-1 is supplied complete with mounting brackets, transparent cover and instructions.

ACCESSORIES:

- | | |
|------------------|--------------------------------------------|
| HI 7020L | 200-275 mV test solution, 500 mL bottle |
| HI 7022L | 470 mV test solution, 500 mL bottle |
| HI 7091L | Reducing solution, 500 mL |
| HI 7092L | Oxidizing solution, 500 mL |
| HI 70300L | Electrode storage solution, 500 mL bottle |
| HI 7061L | Electrode cleaning solution, 500 mL bottle |
| HI 710005 | 115 VAC/12 VDC power adapter |
| HI 710006 | 230 VAC/12 VDC power adapter |
| HI 740146 | Mounting brackets |

For a complete range of ORP electrodes, see pages 63-71

SPECIFICATIONS

Range

0 to 1000 mV

Resolution

1 mV

Accuracy (@20°C/68°F)

±5 mV

Calibration

manual, with CAL trimmer

Dosing Relay

1, max 2A (fuse protected), 250 VAC, 30 VDC

Dosing Selection

reducing or oxidizing; contact open=reducing dosage: activated when reading exceeds setpoint value; contact closed=oxidizing dosage: activated when reading falls below setpoint value

Setpoint

adjustable from 0 to 1000 mV

Overtime

adjustable, typically from 5 to approx. 30 minutes

Input Impedance

10¹² Ohm

Power Supply

BL 982411-0: 12 VDC adapter (included)

BL 982411-1: 115/230 VAC; 50/60Hz

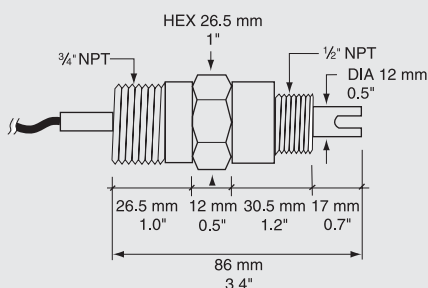
Dimensions

83 x 53 x 99 mm (3.3 x 2.1 x 3.9")

Weight

BL 982411-0: 200 g (7.1 oz.)

BL 982411-1: 300 g (10.6 oz.)



HI 2001 Dimensions

BL 932700 ORP Mini Controller

SPECIFICATIONS

Range

±1000 mV

Resolution

1 mV

Accuracy (@20°C/68°F)

±5 mV

Calibration

manual, with CAL trimmer

Dosing Relay

1, max 2A (fuse protected), 250 VAC, 30 VDC

Dosing Selection

reducing or oxidizing; contact open=reducing dosage: activated when reading exceeds setpoint value; contact closed=oxidizing dosage: activated when reading falls below setpoint value

Setpoint

adjustable from -1000 to 1000 mV

Overtime

adjustable, typically from 5 to approx. 30 minutes

Recorder Output

4-20 mA, accuracy ±0.20 mA, 500 Ohm max load

Input Impedance

10¹² Ohm

Power Supply

BL 932700-0: 12 VDC adapter (included)

BL 932700-1: 115/230 VAC; 50/60Hz

Dimensions

83 x 53 x 99 mm (3.3 x 2.1 x 3.9")

Weight

BL 932700-0: 200 g (7.1 oz.)

BL 932700-1: 300 g (10.6 oz.)



BL 932700 is an ORP mini controller that has been designed for easy, affordable installation in tight spaces, ideal for simple yet effective process control. Thanks to its compact size, BL 932700 can be installed right next to tanks or vats. This versatile controller is ideal for use with many applications, such as ORP monitoring bleaching processes, waste water treatment and swimming pools.

BL 932700 permits automatic control of installations previously checked manually. The instrument can be set for reducing or oxidizing dosage. It measures in the ±1000 mV range, with 1 mV resolution. Setpoint adjustment and calibration are simply performed through trimmers on the front panel. You can also choose automatic or manual dosing mode with a switch on the front panel. Manual control is particularly useful during maintenance operations, because it permits you to enable or disable the dosing relay according to your need. The overtime control system advises you when the relay is active for too long, helping to prevent overdosage.

In addition, this model feature a 4-20 mA analog output for recorder connection. Two models are available, with power supply input at 115/230 VAC or 12 VDC.

ORDERING INFORMATION:

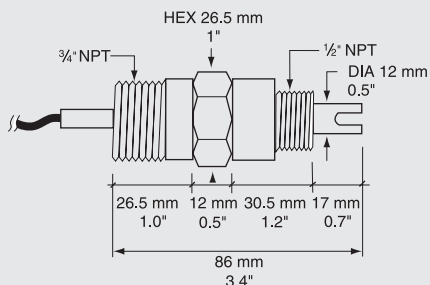
BL 932700-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 932700-1 is supplied complete with mounting brackets, transparent cover and instructions.

ACCESSORIES:

- HI 7020L** 200-275 mV test solution, 500 mL bottle
- HI 7022L** 470 mV test solution, 500 mL bottle
- HI 7091L** Reducing solution, 500 mL
- HI 7092L** Oxidizing solution, 500 mL
- HI 70300L** Electrode storage solution, 500 mL bottle
- HI 7061L** Electrode cleaning solution, 500 mL bottle
- HI 710005** 115 VAC/12 VDC power adapter
- HI 710006** 230 VAC/12 VDC power adapter
- HI 740146** Mounting brackets

For a complete range of ORP electrodes, see pages 63-71



HI 2001 Dimensions

BL Series $\mu\text{S}/\text{cm}$ Conductivity Mini Controllers

These BlackStone mini controllers have been specially designed for the water conditioning and growing applications. Thanks to their compact size, they can be mounted in confined spaces or even right next to the vat or barrel containing the chemicals.

These meters permit automatic control of installations previously checked manually. EC measurements are shown on the large display and the multicolored LED continuously indicates if the mini controller is in measurement, dosing or alarm mode.

BL 983313 measures in the 0 to 1999 $\mu\text{S}/\text{cm}$ range, BL 983320 measures from 0.0 to 199.9 $\mu\text{S}/\text{cm}$ and BL 983322 from 0.00 to 19.99 $\mu\text{S}/\text{cm}$. You can also choose automatic or manual dosing mode with a switch on the front panel. Manual control is particularly useful during maintenance operations, because it permits you to enable or disable the dosing relay according to your need. The overtime control system advises you when the relay is active for too long, helping to prevent overdosage.

ORDERING INFORMATION:

BL 983313-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 983313-1 is supplied complete with mounting brackets, transparent cover and instructions.

BL 983320-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 983320-1 is supplied complete with mounting brackets, transparent cover and instructions.

BL 983322-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 983322-1 is supplied complete with mounting brackets, transparent cover and instructions.

ACCESSORIES:

- HI 7634-00** EC/TDS probe with internal temperature sensor and 2 m cable
- HI 7031L** 1413 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle
- HI 7033L** 84 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle
- HI 7061L** Cleaning solution, 500 mL
- HI 710005** 115 VAC/12 VDC power adapter
- HI 710006** 230 VAC/12 VDC power adapter
- HI 740146** Mounting brackets

SPECIFICATIONS**Range**

BL 983313: 0 to 1999 $\mu\text{S}/\text{cm}$

BL 983320: 0.0 to 199.9 $\mu\text{S}/\text{cm}$

BL 983322: 0.00 to 19.99 $\mu\text{S}/\text{cm}$

Resolution

BL 983313: 1 $\mu\text{S}/\text{cm}$

BL 983320: 0.1 $\mu\text{S}/\text{cm}$

BL 983322: 0.01 $\mu\text{S}/\text{cm}$

Accuracy (@20°C/68°F)

$\pm 2\%$ f.s.

Probe (not included)

HI 7634-00

Temperature Compensation

automatic, 5 to 50°C (41 to 122°F)
with $\beta = 2\%/^{\circ}\text{C}$

Calibration

manual, with CAL trimmer

Dosing Relay

1, max 2A (fuse protected), 250 VAC, 30 VDC contact closed when reading exceeds setpoint value

Setpoint

BL 983313: adjustable from 0 to 1999 $\mu\text{S}/\text{cm}$

BL 983320: adjustable from 0 to 199.9 $\mu\text{S}/\text{cm}$

BL 983322: adjustable from 0 to 19.99 $\mu\text{S}/\text{cm}$

Overtime

adjustable, typically from 5 to approx. 30 minutes

Power Supply

models "-0": 12 VDC adapter (included)

models "-1": 115/230 VAC; 50/60Hz

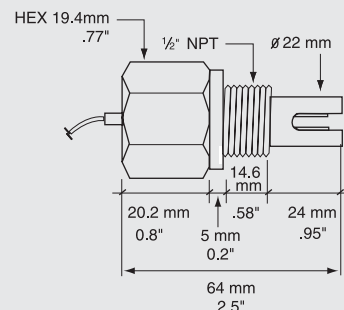
Dimensions

83 x 53 x 99 mm (3.3 x 2.1 x 3.9")

Weight

models "-0": 200 g (7.1 oz.)

models "-1": 300 g (10.6 oz.)



HI 7634-00 Dimensions

BL 983317 • BL 983327 mS/cm Conductivity Mini Controllers

SPECIFICATIONS

Range

0.00 to 10.00 mS/cm

Resolution

0.01 mS/cm

Accuracy (@20°C/68°F)

±2% f.s.

Probe (not included)

HI 7632-00

Temperature Compensation

automatic, 5 to 50°C (41 to 122°F) with $\beta=2\%/^{\circ}\text{C}$

Calibration

manual, with CAL trimmer

Dosing Relay

1, max 2A (fuse protected), 250 VAC, 30 VDC

BL 983317: contact closed when reading falls below setpoint value

BL 983327: contact closed when reading exceeds setpoint value

Setpoint

adjustable from 0 to 10 mS/cm

Overtime

adjustable, typically from 5 to approx. 30 minutes

Power Supply

models "-0": 12 VDC adapter (included)

models "-1": 115/230 VAC; 50/60Hz

Dimensions

83 x 53 x 99 mm (3.3 x 2.1 x 3.9")

Weight

models "-0": 200 g (7.1 oz.)

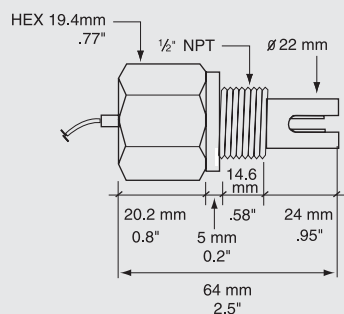
models "-1": 300 g (10.6 oz.)



BL 983317 and BL 983327 are panel mounted mini controllers with an output relay, that have been designed for easy, affordable installation in tight spaces, ideal for simple yet effective process control. They are provided with automatic compensation for variations in temperature.

The probe is easy-to-clean and requires very little maintenance. The calibration is performed at 1 point, through a trimmer. All wiring and connections to external devices are done through the terminals on the rear panel. The multicolor LED continuously indicates if the controller is in measurement, dosing or alarm mode. You can also choose automatic or manual dosing mode with a switch on the front panel. Manual control is particularly useful during maintenance operations, because it permits you to enable or disable the dosing relay according to your need. The overtime control system advises you when the relay is active for too long, helping to prevent overdosage.

Models are available with power supply input at 115/230 VAC or 12 VDC.



HI 7632-00 Dimensions

ORDERING INFORMATION:

BL 983317-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 983317-1 is supplied complete with mounting brackets, transparent cover and instructions.

BL 983327-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 983327-1 is supplied complete with mounting brackets, transparent cover and instructions.

ACCESSORIES:

HI 7632-00 EC/TDS probe with internal temperature sensor and 2 m cable

HI 7031L 1.41 mS/cm calibration solution, 500 mL bottle

HI 7039L 5.00 mS/cm calibration solution, 500 mL bottle

HI 7061L Cleaning solution, 500 mL

HI 710005 115 VAC/12 VDC power adapter

HI 710006 230 VAC/12 VDC power adapter

HI 740146 Mounting brackets

BL Series TDS Minicontrollers



These instruments have been designed for TDS control in hydroponics, horticulture and water conditioning. Thanks to their compact size, they can be mounted in confined spaces or even right next to the vat or barrel containing the chemicals. These meters permit automatic control of installations previously checked manually. Readings are shown on the large display and the multicolored LED continuously indicates if the mini controller is in measurement, dosing or alarm mode.

BL 983315 can control TDS from 0.0 to 199.9 ppm, BL 983319 from 0 to 1999 ppm, BL 983321 from 0.00 to 19.99 ppm and BL 983329 from 0 to 999 ppm. You can also choose automatic or manual dosing mode with a switch on the front panel. Manual control is particularly useful during maintenance operations, because it permits you to enable or disable the dosing relay according to your need. The overtime control system advises you when the relay is active for too long, helping to prevent overdosage.

Models are available with power supply input at 115/230 VAC or 12 VDC.

ORDERING INFORMATION:

BL 983315-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 983315-1 is supplied complete with mounting brackets, transparent cover and instructions.

BL 983319-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 983319-1 is supplied complete with mounting brackets, transparent cover and instructions.

BL 983321-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 983321-1 is supplied complete with mounting brackets, transparent cover and instructions.

BL 983329-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 983329-1 is supplied complete with mounting brackets, transparent cover and instructions.

ACCESSORIES:

HI 7634-00 EC/TDS probe with internal temperature sensor and 2 m cable

HI 7032L 1382 ppm calibration solution, 500 mL bottle

HI 70442L 1500 ppm calibration solution, 500 mL bottle

HI 7061L Cleaning solution, 500 mL

HI 710005 115 VAC/12 VDC power adapter

HI 710006 230 VAC/12 VDC power adapter

HI 740146 Mounting brackets

SPECIFICATIONS

Range

BL 983315: 0.0 to 199.9 ppm

BL 983319: 0 to 1999 ppm

BL 983321: 0.00 to 19.99 ppm

BL 983329: 0 to 999 ppm

Resolution

BL 983315: 0.1 ppm

BL 983319: 1 ppm

BL 983321: 0.01 ppm

BL 983329: 1 ppm

Accuracy (@20°C/68°F)

±2% f.s.

TDS Conversion Factor

BL 983315: 0.5

BL 983319: 0.65

BL 983321: 0.5

BL 983329: 0.5

Probe (not included)

HI 7634-00

Temperature Compensation

automatic, 5 to 50°C (41 to 122°F)

with $\beta=2\%/^{\circ}\text{C}$

Calibration

manual, with CAL trimmer

Dosing Relay

1, max 2A (fuse protected), 250 VAC, 30 VDC contact close when reading:

BL 983315: exceeds setpoint

BL 983319: falls below setpoint

BL 983321: exceeds setpoint

BL 983329: exceeds setpoint

Setpoint

BL 983315: adjustable from 0 to 199.9 ppm

BL 983319: adjustable from 0 to 1999 ppm

BL 983321: adjustable from 0 to 19.99 ppm

BL 983329: adjustable from 0 to 999 ppm

Overtime

adjustable, typically from 5 to approx. 30 minutes

Power Supply

models "-0-": 12 VDC adapter (included)

models "-1-": 115/230 VAC; 50/60Hz

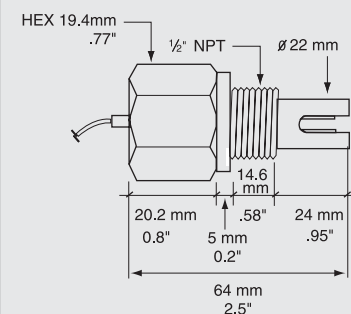
Dimensions

83 x 53 x 99 mm (3.3 x 2.1 x 3.9")

Weight

models "-0-": 200 g (7.1 oz.)

models "-1-": 300 g (10.6 oz.)



HI 7634-00 Dimensions

HI 983318 TDS Mini Controller up to 10,000 ppm

SPECIFICATIONS

Range

0.00 to 10.00 ppt (0 to 10,000 ppm)

Resolution

0.01 ppt (10 ppm)

Accuracy (@20°C/68°F)

±2% f.s.

TDS Conversion Factor

0.5

Probe (not included)

HI 7632-00

Temperature Compensation

automatic, 5 to 50°C (41 to 122°F) with $\beta=2\%/^{\circ}\text{C}$

Calibration

manual, with CAL trimmer

Dosing Relay

1, max 2A (fuse protected), 250 VAC, 30 VDC; contact closed when reading exceeds setpoint value

Setpoint

adjustable from 0 to 10 ppt (10,000 ppm)

Overtime

adjustable, typically from 5 to approx. 30 minutes

Power Supply

BL 983318-0: 12 VDC adapter (included)

BL 983318-1: 115/230 VAC; 50/60Hz

Dimensions

83 x 53 x 99 mm (3.3 x 2.1 x 3.9")

Weight

BL 983318-0: 200 g (7.1 oz.)

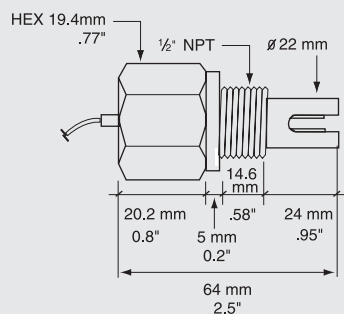
BL 983318-1: 300 g (10.6 oz.)



BL 983318 is a mini controller that has been designed for easy, affordable installation in tight spaces, ideal for simple yet effective process control.

BL 983318 is provided with ATC (Automatic Temperature Compensation) and simple calibration is performed at 1 point through trimmer. The multicolor LED continuously indicates if the controller is in measurement, dosing or alarm mode. Wiring and external device connections are extremely simple to perform through the terminals on the rear of the instrument. You can also choose automatic or manual dosing mode with a switch on the front panel. Manual control is particularly useful during maintenance operations, because it permits you to enable or disable the dosing relay according to your need. The overtime control system advises you when the relay is active for too long, helping to prevent overdosage.

Two models are available, with power supply input at 115/230 VAC or 12 VDC.



HI 7632-00 Dimensions

ORDERING INFORMATION:

BL 983318-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 983318-1 is supplied complete with mounting brackets, transparent cover and instructions.

ACCESSORIES:

- HI 7632-00** EC/TDS probe with internal temperature sensor and 2 m cable
- HI 7038L** 6.44 ppt (6440 ppm) calibration solution, 500 mL bottle
- HI 7061L** Cleaning solution, 500 mL
- HI 710005** 115 VAC/12 VDC power adapter
- HI 710006** 230 VAC/12 VDC power adapter
- HI 740146** Mounting brackets

HI 983324 TDS Mini Controller up to 49.9 ppm

BL 983324 is a panel mounted TDS controller, designed for easy installation, configuration and maintenance.

The meter is provided with a dosing relay, activated when the TDS reading exceeds the setpoint value. Measurements are automatically compensated for temperature variations and shown on the large display. A multicolored LED on the front panel continuously indicates if the minicontroller is in measurement, dosing or alarm mode. Wiring and external device connections are extremely simple to perform through the terminals on the rear of the instrument. You can also choose automatic or manual dosing mode with a switch on the front panel. Manual control is particularly useful during maintenance operations, because it permits you to enable or disable the dosing relay according to your need. The overtime control system advises you when the relay is active for too long, helping to prevent overdosage.

Two models are available, with power supply input at 115/230 VAC or 12 VDC.

ORDERING INFORMATION:

BL 983324-0 is supplied complete with mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 983324-1 is supplied complete with mounting brackets, transparent cover and instructions.

ACCESSORIES:

- HI 7634-00** EC/TDS probe with internal temperature sensor and 2 m cable
HI 7061L Cleaning solution, 500 mL
HI 710005 115 VAC/12 VDC power adapter
HI 710006 230 VAC/12 VDC power adapter
HI 740146 Mounting brackets

SPECIFICATIONS**Range**

0.0 to 49.9 ppm

Resolution

0.1 ppm

Accuracy (@20°C/68°F)

±2% f.s.

TDS Conversion Factor

0.5

Probe (not included)

HI 7634-00

Temperature Compensation

automatic, 5 to 50°C (41 to 122°F)
with $\beta=2\%/^{\circ}\text{C}$

Calibration

manual, with CAL trimmer

Dosing Relay

1, max 2A (fuse protected), 250 VAC,
30 VDC; contact closed when reading exceeds
setpoint value

Setpoint

adjustable from 0 to 49.9 ppm

Overtime

adjustable, typically from 5 to approx. 30 minutes

Power Supply

BL 983324-0: 12 VDC adapter (included)

BL 983324-1: 115/230 VAC; 50/60Hz

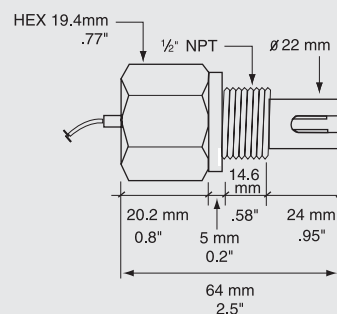
Dimensions

83 x 53 x 99 mm (3.3 x 2.1 x 3.9")

Weight

BL 983324-0: 200 g (7.1 oz.)

BL 983324-1: 300 g (10.6 oz.)

**HI 7634-00 Dimensions**

BL 983314 Resistivity Controller

SPECIFICATIONS

Range

0.00 to 19.90 M Ω /cm

Resolution

0.10 M Ω /cm

Accuracy (@20°C/68°F)

±2% f.s.

Probe (included)

HI 3314

Temperature Compensation

automatic and linear, 5 to 50°C (41 to 122°F)

Temperature Coefficient

$\beta=2.4$; 3.5 ; 4.5 %/°C selectable through jumper on the rear panel

Calibration

factory calibrated

Dosing

Relay 1, max 2A (fuse protected), 250 VAC, 30 VDC; contact closed when reading falls below setpoint value

Setpoint

adjustable from 0 to 19.90 M Ω /cm

Overtime

adjustable, typically from 5 to approx. 30 minutes

Power Supply

BL 983314-0: 12 VDC adapter (included)

BL 983314-1: 115/230 VAC; 50/60Hz

Dimensions

83 x 53 x 99 mm (3.3 x 2.1 x 3.9")

Weight

BL 983314-0: 200 g (7.1 oz.)

BL 983314-1: 300 g (10.6 oz.)

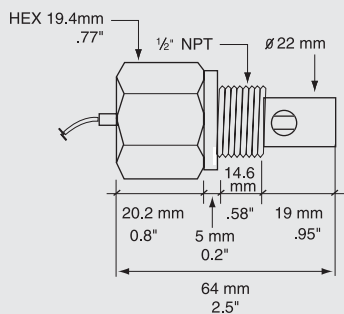


BL 983314 is a simple-to-operate resistivity controller designed for ultrapure water, R.O., and water conditioning applications. The BL 983314 resistivity controller is also ideal for continuous monitoring of process solutions.

Setpoint and calibration are manually adjusted with a trimmer and the alarm relay allows for simple control. Readings are automatically temperature compensated, with three different coefficients ($\beta=2.4$, 3.5 or 4.5 %/°C). The alarm contact can be used for connection to an alarm, pump, solenoid or dosing system. The relay contact is open when readings are higher than the setpoint (+Hysteresis), while for measurements lower than setpoint (-Hysteresis), the relay contact is closed. The Hysteresis is typically 0.20 M Ω /cm around the setpoint.

Measurements are displayed on the large LCD and the multicolored LED continuously indicates if the controller is in measurement, dosing or alarm mode. You can also choose automatic or manual dosing mode with a switch on the front panel. Manual control is particularly useful during maintenance operations, because it permits you to enable or disable the dosing relay according to your need. The overtime control system advises you when the relay is active for too long, helping to prevent overdosage.

Two models are available, with power supply input at 115/230 VAC or 12 VDC.



HI 3314 Dimensions

ORDERING INFORMATION:

BL 983314-0 is supplied with HI 3314 probe, mounting brackets, transparent cover, 12 VDC power adapter and instructions.

BL 983314-1 is supplied with HI 3314 probe, mounting brackets, transparent cover and instructions.

ACCESSORIES:

- HI 3314** Resistivity probe
- HI 710005** 115 VAC/12 VDC power adapter
- HI 710006** 230 VAC/12 VDC power adapter
- HI 740146** Mounting brackets

HI 7871 • HI 7873 Level Mini Controllers

HI 7871 and HI 7873 mini level controllers are ideal for liquid level control over distances of up to 100 meters (330 feet). They are highly compact and will fit into tight spaces. These easy-to-use controllers are ideal for nearly any liquid level application, such as industrial and municipal water treatment, nutrient tank control in farming, hydroponics, aquacultural applications and plating rinse baths. HI 7871 features high and low level control, while HI 7873 includes an overflow alarm. Both instruments can be connected to a 2-wire transmitter, which is ideal for level monitoring in remote applications.

A complete liquid level measuring system requires:

1. A controller (HI 7871 or HI 7873)
2. A bar holder with amplifier circuitry (HI 7874)
3. A package of measuring bars (HI 731324)
4. An undecal connector (HI 7164)

HI 7871 requires 3 bars, one each for low and high levels and the third as a consent sensor.

HI 7873 requires 4 bars with the additional bar used for overflow measurement.

ORDERING INFORMATION:

HI 7871/115 (115 VAC) is supplied complete with mounting brackets and instructions.

HI 7871/220 (220 VAC) is supplied complete with mounting brackets and instructions.

HI 7873/115 (115 VAC) is supplied complete with mounting brackets and instructions.

HI 7873/220 (220 VAC) is supplied complete with mounting brackets and instructions.

ACCESSORIES:

HI 7874 Level transmitter with internal amplifier

HI 7164 Undecal connector

HI 731324 Stainless steel threaded measuring bars (5 pcs.)

SPECIFICATIONS**Transmission**

max 100 meters (330 feet)

Electrical Connection

HI 7164 undecal connector (not included)

Level Adjustment

HI 7871: high and low

HI 7873: high, low and overflow

Level Indication

HI 7871: high and low

HI 7873: high, low and overflow

Sensor Bars

HI 7871: 3 (not included) (HI 731324, 5 pcs.)

HI 7873: 4 (not included) (HI 731324, 5 pcs.)

Transmitter

HI 7874 (not included)

Output Contact

HI 7871: 1 relay (2A/250 VAC, 30 VDC)

HI 7873: 2 relays (2A/250V, 30 VDC)

Power Supply

models "/115": 110/115 VAC; 50/60Hz

models "/220": 220/240 VAC; 50/60Hz

Environment

0 to 50°C (32 to 122°F);

RH max 85% non condensing

Dimensions

83 x 53 x 95 mm (3.1 x 1.9 x 3.8")

Weight

250 g (8.8 oz.)

HI 7874 Level Transmitter

SPECIFICATIONS

Transmission

max 100 meters (330 feet)

Electrical Connection

2-wire terminal

Level Adjustment

high, low and overflow

Sensor Bars

3 or 4 (not included) (HI 731324 pack of 5 pcs.)

Power Supply

from level controller

Environment

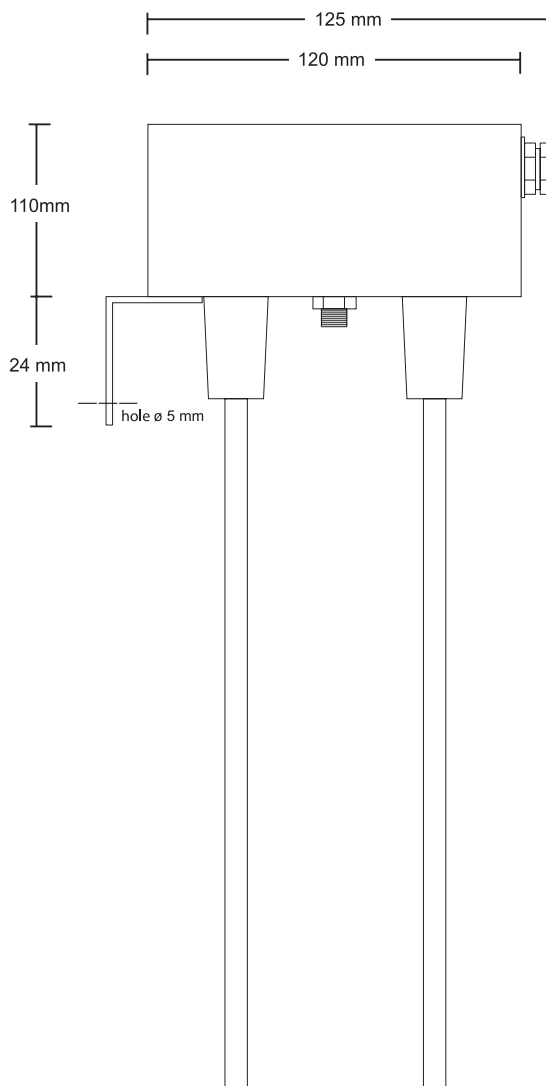
0 to 50°C (32 to 122°F); RH max 100%

Weight

550 g (1.2 lb.)

Level control is very important in many industrial applications, especially for process adjustments using aggressive chemicals. Our sensor bars are built with stainless steel for long life even in harsh conditions. They are easy to install and ideal for monitoring tanks and water conditioning plants.

The HI 7874 transmitter has been designed to be combined with the HI 7871 and HI 7873 level controllers. The transmitter is housed in a durable and waterproof ABS body, and allows the user to easily adjust the length of the sensor bars according to the specific need. HI 7874 is supplied with a sturdy mounting bracket for quick and easy installation.



ORDERING INFORMATION:

HI 7874 is supplied complete with mounting bracket and instructions.

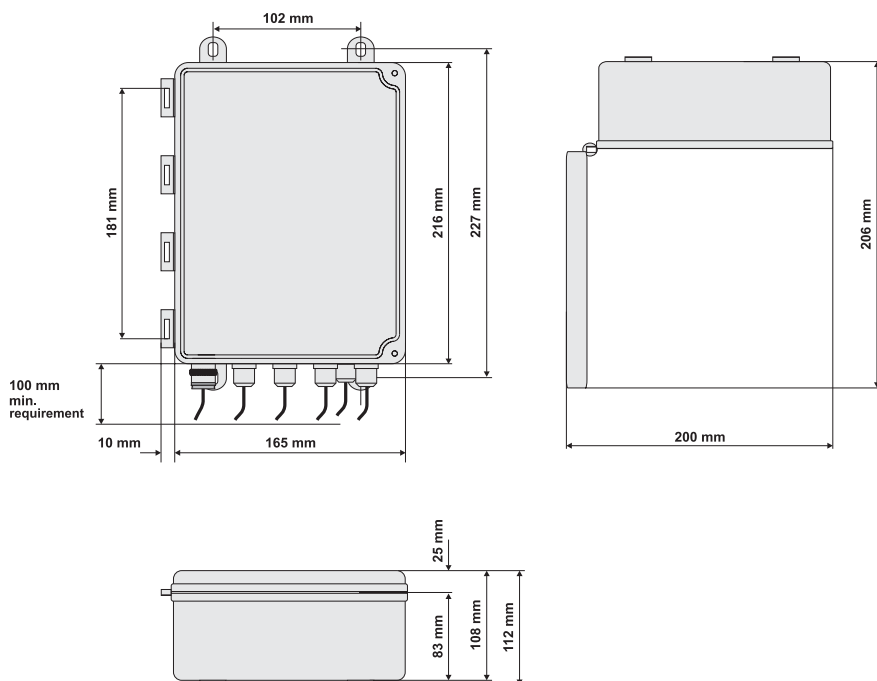
ACCESSORIES:

HI 731324 Stainless steel threaded measuring bars (5 pcs.)

Two-Wire pH & ORP Transmitters

Two-wire transmitters are widely used for process control in industry. These instruments are particularly useful in industrial conditions where electrical interference is an important factor. By galvanically isolating the signals, any interference created is prevented from reaching the transmitter. One usually associates industrial environments with corrosive conditions, therefore any instrumentation used must be resistant to liquids and corrosion. HANNA instruments® transmitters meet all of these criteria and they only use two wires which reduces costs and eliminates the need for expensive coaxial cable. Two-wire transmitters are ideal when used in remote applications that do not have AC power available. As technology advances it is becoming more important to monitor certain processes closely, particularly from remote locations. Computers are commonly used to receive signals from transducers that have travelled a great distance (up to 300 meters, 1000'). When transmitting signals over such a distance, it is likely that a substantial portion of the signal will be absorbed by the resistance of the lines. Considerable differences in ground potentials and between the signal source and load, are inherent to long lines.

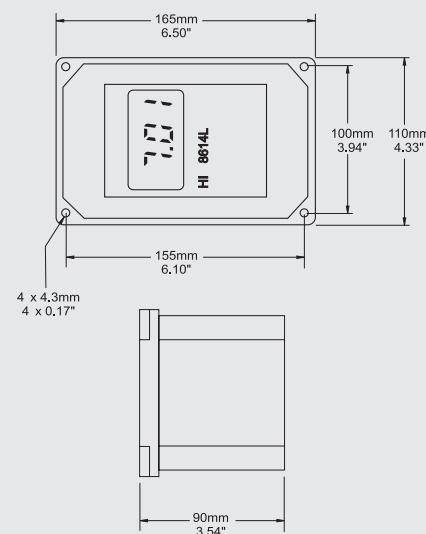
Powering the system with an AC supply is beneficial in eliminating this problem. One of the two wires is power ground return, while the other is the power supply. The power supply line acts in a dual manner, as a power supply, and as a signal carrier. This allows the transmitter to operate with 2 wires. The signal current from the process controller is normally 4 to 20 mA. When the load is connected with the power supply return line, the signal current will be proportional in the range of 4 to 20 mA. The ability to use a thinner gauge of wire greatly reduces the costs associated with the wiring of remote transmitters. Typically, a heavy gauge of shielded cable is required in order to minimize the ambient electrical noise from AC power sources, interference from electrical equipment or various other sources of noise. Thin wire will also provide better operation when the transmitter current output is a 4 to 20 mA signal. All of these features and many more, give HANNA instruments® transmitters the versatility to be used over long distances in almost any process control application.



Conductivity, 4-Ring Technology

HANNA instruments® conductivity transmitters use 4-ring Potentiometric probes. As opposed to the more widely used 2-electrode Amperometric method, the 4-ring Potentiometric method provides the highest accuracy and repeatability attainable. When measuring liquids that have a high conductivity, the 2-electrode system is susceptible to polarization. This condition makes it exceptionally difficult to obtain measurements with any accuracy. The polarization is directly related to the electrode's current load, and will cause a considerable, non-linear drop in the voltage. As a result, the solution around the electrode simulates a low conductivity condition.

4-ring electrodes eliminate the polarization effect by splitting the four rings into 2 current and 2 voltage electrodes. When placed in a conductive liquid, the 2 current electrodes take the alternating voltage and create a current. This alternating current produces a Buffer Field from which polarization is absent. The voltage is then measured in this field assuring no altered readings.



HI 8614 pH Indicator and Transmitter



SPECIFICATIONS

Range

4 to 20 mA / 0.00 to 14.00 pH

Resolution

0.01 mA / 0.01 pH

Accuracy (@20°C/68°F)

±0.02 mA / ±0.02 pH

Calibration

offset: ±2.2 mA / ±2 pH;
slope: ±0.5 mA / 86 to 116%

Temperature Compensation

fixed or automatic from 0 to 100°C (32 to 212°F)
with HI 76608 probe

Input Impedance

10¹² Ohm

Output

4-20 mA (isolated)

pH Electrode (not included)

see electrode section (pages 63-71)

Temperature Probe (not included)

HI 76608

Protection

IP 65

Power Supply

HI 8614: 18-30 VDC

HI 8614L: 20-36 VDC

Load

max 500 Ohm

Environment

0 to 50°C (32 to 122°F);
RH max 95% non-condensing

Dimensions

165 x 110 x 90 mm (6.5 x 4.3 x 3.5")

Weight

1 kg (2.2 lb.)



- Water resistant
- High impedance input
- Automatic temperature compensation
- Available with and without LCD

The HI 8614 is a water-resistant pH transmitter designed with a high impedance input to accept signals directly from a pH electrode. The signal is then processed by a special high-impedance amplifier, which transmits an output current directly proportional to the input signal but independent of changes in load or cable capacitance.

Calibration is performed by adjustment of two independent trimmers for slope and offset. Temperature compensation is performed by the transmitter's ATC circuitry when measurements are taken with a temperature probe attached, it is also possible to substitute a fixed resistor for the temperature probe, if ATC is not required. The transmitter can be connected to HANNA instruments® controllers HI 8510, HI 8710 or HI 8711, recorders, computers or any data monitoring device that accepts 4 to 20 mA input.

Two versions are available, the standard model HI 8614, and HI 8614L with an LCD, which allows easy verification and monitoring of measured values, and is easier to calibrate and maintain.

ORDERING INFORMATION:

HI 8614 is supplied complete with instructions.

HI 8614L (with display) is supplied complete with instructions.

ACCESSORIES:

- | | |
|-----------------|-------------------------------------------|
| HI 76608 | Temperature probe with 3 m (9.9') cable |
| HI 6054B | Electrode holder for in-line applications |
| HI 7004L | pH 4.01 buffer solution, 500 mL bottle |
| HI 7007L | pH 7.01 buffer solution, 500 mL bottle |
| HI 7010L | pH 10.01 buffer solution, 500 mL bottle |

For HI 8614L only

- | | |
|------------------|-------------------------------------------|
| HI 8427 | pH / ORP electrode simulator |
| HI 931001 | pH / ORP electrode simulator with display |

For a complete range of pH electrodes, see pages 63-71

HI 8615 ORP Transmitter



The HI 8615 has been designed for transmitting ORP measurements from remote locations in industrial environments. It features two controls (one for 4 mA and one for 20 mA) to compensate for electronic drift and ambient temperature.

The transmitter uses a universal BNC socket for quick and secure connection of any ORP electrode with a BNC connector. IP65 rating and a rugged polypropylene casing provide optimum protection even in harsh environments, making this instrument ideal for chromium hexavalent reductions, cyanide oxidation reactions and water sanitation. The transmitter can be connected to HANNA instruments® meters HI 8512, HI 8720 or any recorders, computers or data monitor that accepts 4 to 20 mA input.

Two versions are available, the standard model HI 8615, and HI 8615L with an LCD, which allows easy verification and monitoring of measured values, and is easier to calibrate and maintain.

ORDERING INFORMATION:

HI 8615 is supplied complete with instructions.

HI 8615L (with display) is supplied complete with instructions.

ACCESSORIES:

- HI 6054B** Electrode holder for in-line applications
- HI 7020L** 200-275 mV test solution, 500 mL bottle
- HI 7091L** Reducing solution, 500 mL bottle
- HI 7092L** Oxidizing solution, 500 mL bottle

For HI 8615L only

- HI 8427** pH / ORP electrode simulator
- HI 931001** pH / ORP electrode simulator with display

For a complete range of ORP electrodes, see pages 63-71

SPECIFICATIONS

Range

4 to 20 mA / -1000 to +1000 mV

Resolution

0.01 mA / 1 mV

Accuracy (@20°C/68°F)

±0.02 mA / ±5 mV

Calibration

offset: ±0.8 mA / offset: ±100 mV

slope: ±0.8 mA / slope: 90 to 110%

Input Impedance

10¹² Ohm

Output

4-20 mA (isolated)

ORP Electrode (not included)

see electrodes section (pages 63-71)

Protection

IP 65

Power Supply

HI 8615: 18-30 VDC

HI 8615L: 20-36 VDC

Load

max 500 Ohm

Environment

0 to 50°C (32 to 122°F);

RH max 95% non-condensing

Dimensions

165 x 110 x 90 mm (6.5 x 4.3 x 3.5")

Weight

1 kg (2.2 lb.)

HI 8936 Conductivity Transmitter



SPECIFICATIONS

Range

HI 8936A/HI 8936AL: 0.0 to 199.9 mS/cm

HI 8936B/HI 8936BL: 0.00 to 19.99 mS/cm

HI 8936C/HI 8936CL: 0 to 1999 μ S/cm

HI 8936D/HI 8936DL: 0.0 to 199.9 μ S/cm

Resolution (for "L" models only)

HI 8936AL: 0.1 mS/cm

HI 8936BL: 0.01 mS/cm

HI 8936CL: 1 μ S/cm

HI 8936DL: 0.1 μ S/cm

Accuracy (@20°C/68°F)

$\pm 2\%$ F.S. (excluding probe error)

Calibration

manual, 2 point, with offset and slope trimmers

Temperature Compensation

fixed or automatic from 0 to 50°C (32 to 122°F)
with $\beta=2\%/^{\circ}\text{C}$

Output

4-20 mA, not isolated, max 500 Ohm

Probe (not included)

HI 7635 (in-line) or HI 7638

Protection

IP 65

Power Supply

without LCD: 12-30 VDC; with LCD: 17-36 VDC

Environment

0 to 50°C (32 to 122°F);

RH max 95% non-condensing

Dimensions

165 x 110 x 90 mm (6.5 x 4.3 x 3.5")

Weight

1 kg (2.2 lb.)



- Utilizes HANNA's potentiometric 4-ring conductivity probe
- 4-ring probe resists contamination by unclean solutions to operate at peak performance at all times
- Automatic temperature compensation
- Direct probe connection eliminates signal loss
- Available with or without LCD
- Use in conjunction with HI 7638 platinum conductivity probe

HANNA instruments®' 4-ring potentiometric conductivity probe is virtually immune to contamination by unclean solutions. This allows the transmitter to operate at peak performance at all times. Temperature effects are compensated for by the built-in temperature sensor in the probe and the transmitter's ATC circuitry with a β of 2%/°C. Direct connection of the probe to the transmitter assures a positive electrical connection with no signal loss over long distances.

Two versions are available, HI 8936 without an LCD, and the LCD version, HI 8936L. HI 8936L allows easy verification and monitoring of measured values, and is easier to calibrate and maintain. The HI 8936 series should be used in conjunction with the HI 7635 in-line probe or HI 7638 platinum probe (page 72). The HI 8936 series requires external power to the 4-20 mA current loop.

ORDERING INFORMATION:

All HI 8936 models are supplied complete with instructions.

ACCESSORIES:

HI 779/10	6-wire cable (10 m / 33')
HI 7030L	12880 μ S/cm calibration solution, 500 mL bottle
HI 7031L	1413 μ S/cm calibration solution, 500 mL bottle
HI 7033L	84 μ S/cm calibration solution, 500 mL bottle
HI 7034L	80000 μ S/cm calibration solution, 500 mL bottle

HI 98143 pH and EC Transmitter



- Accepts pH electrode and EC probe signals simultaneously
- Direct probe connection assures a positive electrical connection eliminating signal loss
- Automatic temperature compensation (EC only)

HI 98143 is a pH and conductivity transmitter designed to accept signals directly from a pH electrode and a conductivity probe at the same time. Direct connection of the probes to the transmitter assures a positive electrical connection with no signal loss. This transmitter is most useful in remote process control applications.

Four models are available, transmitting a 0-1 V, 0-4 V or 4-20 mA signal. The output signals are proportional to the input signals but independent of changes in load or cable capacitance. Temperature compensation for conductivity measurements is performed by the transmitter's ATC circuitry. The transmitter can be connected to any pH or conductivity controller, recorder, computer or any data monitoring device that accepts 0 to 1 V, 0 to 4 V or 4 to 20 mA input.

HI 98143 is an ideal tool for applications that require the monitoring of both pH and conductivity at the same time.

ORDERING INFORMATION:

All **HI 98143** models are supplied complete with instructions.

HI 98143-01 with 0-1 V isolated output

HI 98143-04 with 0-4 V isolated output

HI 98143-20 with 4-20 mA isolated output

HI 98143-22 with 4-20 mA isolated output (specific for the HI 8000 controllers, see Hanna General Catalog for more information.)

ACCESSORIES:

HI 7004/1L pH 4.01 buffer solution, 1 L bottle

HI 7007/1L pH 7.01 buffer solution, 1 L bottle

HI 7010/1L pH 10.01 buffer solution, 1 L bottle

HI 7039L 5000 μ S/cm calibration solution, 500 mL bottle

HI 7855/1 1 m (3.3') connection cable with BNC and screw connectors

For a complete range of pH and EC probes, see pages 63-71

SPECIFICATIONS

Range

0 to 14 pH; 0 to 10 mS/cm

Accuracy (@20°C/68°F)

pH: $\pm 0.5\%$ F.S.; EC: $\pm 2\%$ F.S.

Input Impedance

10^{12} Ohm

Calibration

manual; with offset (pH4/10) and slope (pH7) trimmers for pH; at 0 and 5 mS/cm for EC

Temperature Compensation

(EC) automatic, 0 to 60°C (32 to 132°F) with $\beta=2\%/^{\circ}\text{C}$

Output (isolated)

HI 98143-0: 0-1 V

HI 98143-4: 0-4 V

HI 98143-20: 4-20 mA

HI 98143-22: 4-20 mA

Protection

IP 54

Power Supply

12-24 VDC

Environment

0 to 50°C (32 to 122°F);

RH max 95% non-condensing

Dimensions

160 x 105 x 31 mm (6.3 x 4.1 x 1.2")

Weight

280 g (9.9 oz.)

HI 504910 Digital Transmitter

SPECIFICATIONS

Range

-2.00 to 16.00 pH; -2000 to +2000 mV;
-30 to 130.0°C

Resolution

0.01 pH; 1 mV; 0.1°C

Accuracy (@20°C/68°F)

±0.02 pH; ±2 mV; ±0.5°C

Installation Category

II

pH Calibration

automatic, 1 or 2 point with 5 memorized buffer values (pH 4.01, 6.86, 7.01, 9.18, 10.01)

Temperature Compensation

automatic or manual, -30 to 130°C (-22 to 266°F)

Temperature Probe

with 2 or 3-wire Pt100 or Pt1000 sensor
(with automatic recognition and damage test)

Power Supply

24 VAC/dc ± 20%

Power Consumption

5 VA

Over Current Protection

400 mA, 250 V fast fuse

Infrared Optical Interface towards HI 504920

RS232, baud rate fixed to 2400

Data Logging

6000 pH/°C or ORP samples

Environment

0 to 50°C (32 to 122°F);
RH max 85% non-condensing

Enclosure

fiberglass NEMA case 4X type

Dimensions

216 x 165 x 108 mm (8.5 x 6.5 x 4.25")
excluding mounting feet

Weight

1.5 kg (3.3 lb.)



HI 504910 can acquire and transmit pH, ORP and °C measurements in a digital format to the HI 504 controller, or a computer workstation. The digital link allows the user to send additional information, regarding the pH, ORP and temperature probes. Moreover, this transmitter is provided with the sensor check feature for pH and ORP electrodes, and can be connected to a Pt100 or Pt1000 temperature sensor (with automatic recognition and damage test).

The general setting and measurement parameters of the instrument can be easily set by the user independently for pH and ORP configurations. The pH range can be calibrated through a normal 2-point procedure or through the innovative one-point system using HI 504920 (see following page). The temperature compensation mode can be automatic or manual (automatically selected when a temperature input error occurs). The transmitter can store up to 6000 samples, pH/°C or ORP, complete with information about last calibration data (date and time, pH offset and slope, number and values of the used buffers).

All stored data can be downloaded through the RS485 communication port using our HI 92500 software.

ORDERING INFORMATION:

HI 504910 is supplied complete with instructions.

ACCESSORIES:

HI 504900	GSM module
HI 504901	GSM supervisor
HI 504920	Remote user interface pH meter & calibrator
HI 7920	HI 504910/HI 504920 interface cable
HI 7610	Stainless steel Pt100 probe
HI 7611	Stainless steel Pt1000 probe
HI 92500	Windows® compatible software
HI 7004/1L	pH 4.01 buffer solution, 1 L bottle
HI 7007/1L	pH 7.01 buffer solution, 1 L bottle
HI 7010/1L	pH 10.01 buffer solution, 1 L bottle
HI 7020L	200-275 mV test solution, 500 mL bottle

For a complete range of pH and ORP electrodes, see pages 63-71

HI 504920 pH Meter and Calibrator for Digital Transmitters



The digital calibrator is an absolute necessity for calibrating field transmitters. Calibration of process instrumentation over long distances is now made quick and simple with the introduction of the HI 504920.

The HI 504920 is a hand held portable instrument for the measurement of pH/ORP and temperature and it functions as a reference pH meter by which to calibrate the new HI 504910 transmitter.

Quick, single-point calibration is performed in three simple steps:

1. Connect the calibrator to the transmitter by means of the special cable, HI 7290.
2. Immerse the calibrator electrode in a sample of the process solution taken as close as possible to the installed process electrode. Wait for the signal to stabilize.
3. Press a button to transfer the data to the transmitter, and wait for confirmation on the display. The operator can now store the reading on the portable meter and later connect the calibrator to the transmitter in order to calibrate the system.

ORDERING INFORMATION:

HI 504920 is supplied complete with HI 62920 pH electrode, HI 7920 interface cable, pH 4 and pH 7 buffer solutions, batteries, 12 VDC power adapter, rugged carrying case and instructions.

ACCESSORIES:

- HI 62920** Amplified pH electrode with internal temperature sensor and titanium cage
- HI 7920** HI 504910/HI 504920 interface cable
- HI 7004/1L** pH 4.01 buffer solution, 1 L bottle
- HI 7007/1L** pH 7.01 buffer solution, 1 L bottle
- HI 7010/1L** pH 10.01 buffer solution, 1 L bottle

SPECIFICATIONS

Range

-4.00 to 19.00 pH;
±600.0 mV; ±2000 mV;
-20 to 120.0°C

Resolution

0.01 pH;
0.1 mV (within ±400.0 mV);
0.2 mV (±400 to ±600 mV);
±0.1°C (-10°C to 120°C); 1°C (below -10°C)

Accuracy (@20°C)

±0.01 pH;
±0.2 mV (within ±400.0 mV);
±0.4 mV (±400 to ±600 mV); ±2 mV (outside);
± 0.4°C (0 to 70°C); ±1°C (outside)

Calibration

pH: automatic, 1 or 2 point, with 5 memorized buffer values (pH 4.01, 6.86, 7.01, 9.18, 10.01)
mV: automatic, 2 point (0, 350 mV) or 3 point (0, 350, 1900 mV)

pH Electrode

HI 62920 amplified electrode with internal temperature sensor, Matching Pin and DIN connector (included)

Temperature Compensation

automatic, -20 to 120°C (-4 to 248°F)

Input Impedance

10¹² Ohm

Power Supply

4 x 1.5V AA batteries (approx. 300 hours of continuous use) or 12 VDC input

Infrared Interface

through HI 7920 cable (included)

Environment

0 to 50°C (32 to 122°F); RH 100%

Dimensions

196 x 80 x 60 mm (7.7 x 3.1 x 2.4")

Weight

500 g (1.1 lb.)

HI 504900 GSM Module



SPECIFICATIONS

Max Output Power

2 W for EGSM900; 1 W for GSM1800/1900

SIM Interface

3 V type SIM card

Antenna

dual band (900/1800/1900 MHz)

Installation Category

I

Power Supply

12 VDC adapter (included)

RS485 Channel

for connection of all instruments with RS485 in the same bus; baud rate up to 19200

Environment

0 to 50°C (32 to 122°F);
RH max 85% non-condensing

Enclosure

fiberglass NEMA case 4X type

Dimensions

240 x 154 x 79 mm (7.9 x 6.1 x 3.1")

Weight

800 g (1.8 lb.)



HI 504900 is a GSM module to be used for connecting advanced HANNA instruments® controllers provided with RS485 port to the GSM network and directly to the user cellular telephone. The module will send alarm SMS when errors occur on the instruments included in the RS485 network, and information SMS about the process status upon user request.

The GSM module allows users to store two cellular phone numbers, to be used for alarm SMS sending. The message is a simple, easy to understand text string. In addition, HI 504900 can download data and perform a complete remote control of all instruments connected to the RS485 network, by using the HANNA instruments® HI 92500 software and a simple modem connection. The GSM module is also provided with an LED indicator, which gives information about the module operating status.

ORDERING INFORMATION:

HI 504900-1 (900/1900 MHz GSM module) is supplied complete with 115 VAC/12 VDC power adapter and instructions.

HI 504900-2 (900/1800 MHz GSM module) is supplied complete with 230 VAC/12 VDC power adapter and instructions.

ACCESSORIES:

HI 710005 115 VAC/12 VDC power adapter

HI 710006 230 VAC/12 VDC power adapter

HI 92500 Windows® compatible software

HI 504901 GSM Supervisor



HI 504901 is an intelligent interface between HANNA instruments® meters with RS232 or RS485 port, and a GSM cellular phone or a local or remote computer with HI 92500 HANNA instruments® software.

HI 504901 can acquire information about active alarms, errors, current status and real time values through two RS232 serial ports with the HI 8000 series, or through the RS485 port with the HI 504, HI 23, HI 24, HI 700 and HI 710 series, and with the HI 504910 transmitter. HI 504901 is also provided with one digital input (typically an alarm relay) from "non-intelligent" instruments, with only an alarm relay contact or another digital output signal. Moreover, the interface features one digital output and an input for enabling/ disabling the SMS sending function.

LED indicators advise the user for error conditions, active alarms, signal coverage for the cellular module, digital output and cellular module status. HI 504901 can be completely configured through the HI 504901SW software provided with the instrument. Other important characteristics of the interface are the real time clock, self diagnostic capabilities and internal backup battery which provides power supply and cause an alarm SMS sending in case of power failure.

ORDERING INFORMATION:

HI 504901-1 (900/1900 MHz GSM supervisor) is supplied complete with 115 VAC/12 VDC power adapter, HI 504901SW configuration software and instructions.

HI 504901-2 (900/1800 MHz GSM supervisor) is supplied complete with 230 VAC/12 VDC power adapter, HI 504901SW configuration software and instructions.

ACCESSORIES:

HI 710005 115 VAC/12 VDC power adapter
HI 710006 230 VAC/12 VDC power adapter
HI 920010 Serial cable for PC connection
HI 92500 Windows® compatible software

SPECIFICATIONS

Max Output Power

2 W for EGSM900; 1 W for GSM1800/1900

SIM Interface

3V SIM card

Antenna

dual band (900/1800/1900 MHz)

Digital Input Channel

supporting mechanical relays or open-collector outputs

Digital Output Channel

open-collector output, 5 mA/30V max.

Installation Category

I

Power Supply

12 VDC adapter (included) and internal rechargeable backup battery (12 V/0.8 Ah)

RS485 Channel

for connection of all instruments with RS485 in the same bus;

Towards Instruments

baud rate up to 9600

RS232 Channel

for connecting 2 instruments with RS232 port;

Towards Instruments

baud rate up to 9600 (limited by the instrument)

RS232 Auxiliary Port

for PC connection

Environment

0 to 50°C (32 to 122°F);
RH max 85% non-condensing

Enclosure

ABS case, IP54

Dimensions

240 x 200 x 98 mm (9.4 x 7.9 x 3.9")

Weight

approx. 1.4 kg (3.1 lb)

HI 504902 RS485 Modem

SPECIFICATIONS

Telecom Certifications

Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Liechtenstein, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Norway, Philippines, Poland, Portugal, Russia, Singapore, Slovak Republic, South Africa, Spain, Sweden, Switzerland, Taiwan, Turkey, United Kingdom, United States

Functions

data service; remote control by AT commands

Power Supply

12 VDC adapter (included)

Dimensions

165 x 110 x 35 mm (6.5 x 4.3 x 1.4")

Weight

approx. 250 g (0.55 lb.)



HI 504902 is a standard modem provided with RS485 port. It allows remote control of HANNA instruments® meters with an RS485 port, from a PC, using the HI 92500 software, through a standard telephone line. The modem is included in an RS485 network and connected to an analog telephone line. This way, HI 504902 allows the user to receive and transmit data to the instruments in the RS485 network through a simple telephone connection. The modem is also provided with LEDs that indicate if the device is ON and its operating status (data receiving or transmitting).

ORDERING INFORMATION:

HI 504902 is supplied complete with 12 VDC power adapter and instructions.

ACCESSORIES:

HI 710005 115 VAC/12 VDC power adapter
HI 710006 230 VAC/12 VDC power adapter
HI 920010 Serial cable for PC connection
HI 92500 Windows® compatible software

BL Series Controllers with Dosing Pumps

pH and ORP MEAsuring and DOSing System

Two Advanced Instruments in One. MEADOS pumps combine the powerful Black Stone dosing pumps with the state-of-the-art controllers that HANNA instruments® is famous for. These unique products were developed by Black Stone for measuring and controlling pH or ORP and the regulated dosing of various chemicals. This latest innovation eliminates the need for multiple instruments by combining two instruments into one. No more complicated installations, wiring, and compatibility problems. This compact unit features accurate regulation, proportional dosing, alarm and recorder signals and much more all in one meter.

Easy Installation

Designed with mounting holes in the rugged base, Black Stone pump/controllers are simple to install. There is no need for any additional hardware. All of the controls and pump assemblies are conveniently located on the front of the unit. If the operator must access the pump head or control panel for any reason, there is no need to uninstall the unit.

Rugged Construction

Black Stone pump/controllers are housed in rugged, fiber-reinforced polypropylene casings. They are IP55 rated, preventing ingress of liquids. The material used for the housing resists corrosion caused by most chemicals, protecting the unit from hazardous spills and splashes.

Superior Materials

Black Stone pumps use Kynar®, Viton® and Teflon® materials for all components in contact with the chemicals being dosed. These materials have properties which enable them to resist even the most corrosive chemicals in the industry. Black Stone's choice of material makes the pump more versatile, allowing it to handle a wider variety of reagents. The chemical resistance chart on page 60 shows how well Teflon®, Viton® and Kynar® resist the harmful effects of different products.

Simple Pump Action

A positive displacement solenoid with few moving parts makes Black Stone pumps more reliable than motor driven pumps. With no rotating parts, gears or cams, part wear and oiling associated with motor driven pumps is eliminated, drastically reducing any chance of mechanical failure.

Proportional Dosing

The Black Stone controller/pump strokes at full capacity when the measured value deviates by more than 1.5 pH or 150 mV from the set value. A proportional control slows down the stroke rate as the measured value approaches the user-selectable value, avoiding overdosage of chemicals. This feature makes the pump's dosing more accurate, saves chemicals and eliminates unnecessary and costly corrections of your processes, especially with slow reacting chemicals.

Isolated Recorder Output

To enhance troubleshooting and provide the user with the ability to record data while monitoring, the Black Stone controller/pumps provide a recorder output. By simply attaching a recorder to the instrument's 4 to 20 mA output contacts, conveniently located on the front panel, you can obtain a hard copy of the results on demand.

Alarm Output

When monitoring and controlling pH and ORP levels in a process, it is very important that any potential problem does not go unattended. The HANNA instruments® MEADOS units incorporate an alarm system that will alert the user if the reaction is not within certain guidelines.

The alarm of the BL 7916 will be activated if the measured pH value is 2 pH units lower than the set point (if dosing acid, this indicates overdosage, a common symptom of siphoning). The alarm will also activate if the value is 2 pH higher than the set point (if dosing acid, this is an indication of insufficient dosage, a common symptom of the lack of reagents). The BL 7917's alarm will activate if the mV value is 200 mV lower than the set point (if dosing reducing chemicals, this indicates overdosage). The alarm will also activate if the value is 200 mV higher than the set point (if dosing reducing chemicals, this is an indication of lack of reagents).

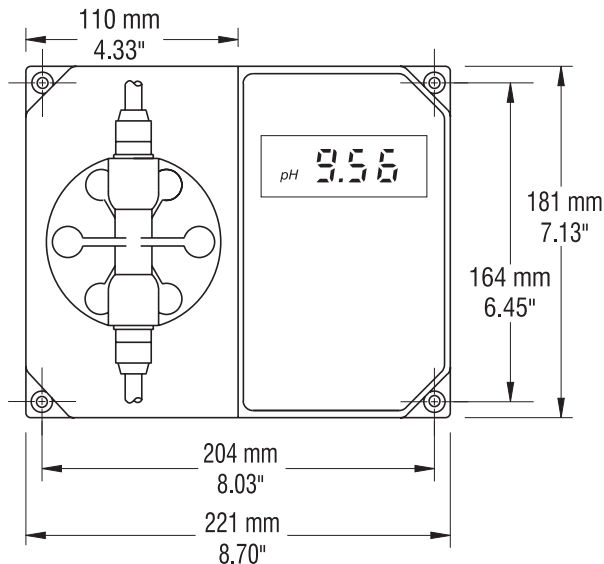
Auxiliary Dosing Contacts

The auxiliary dosing contacts of the MEADOS units are closed whenever the pump is dosing. This solution offers considerable advantages, especially for small plants, where these pumps need to be the only equipment left running. This will spare other equipment such as mixers, priming pumps etc. With this feature activated, a mixer can be automatically started, when the pump is dosing.

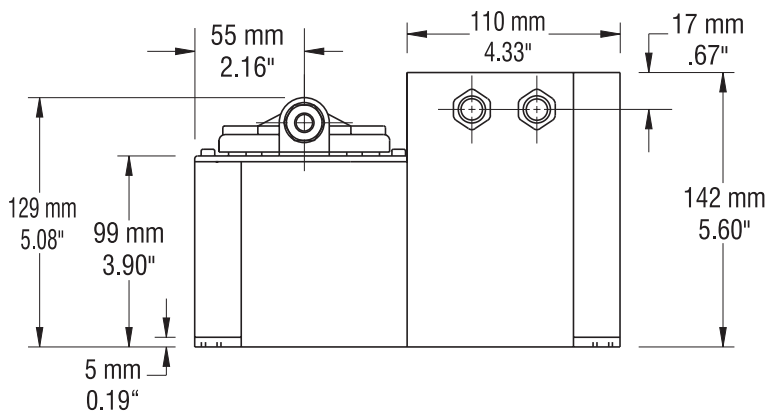
BL 7916 / BL 7917	
Pressure (bar)	Flow Rate (LPH)
0.5	13.3
1.0	11.7
2.0	10.1
3.0	9.0
4.0	7.8

BL Series Controllers with Dosing Pumps

Mechanical Dimensions for the MEADOS pH and ORP Measuring and Dosing Systems



The Controller/Pump series of instruments are enclosed in a modular housing for maximum protection. These illustrations show the layout of the Controller/Pumps and how they utilize the one-piece polypropylene, injection molded housing. Since there are no joints or screws holding different sections of the housing together, the case is extremely rugged and sturdy.



This series of instruments will mount easily in your plant using a minimum of wall space. The controls and pump head are located in the front to allow easy access.

BL 7916 pH Controller with Dosing Pump

- pH controller and dosing pump in one compact unit.
- ± 0.01 pH accuracy with unbeatable performance.
- Isolated 4 to 20 mA recorder output.
- Proportional dosing slows the pump down when the measured pH level approaches the set value which ensures precise dosage and avoids costly waste of chemicals due to overdosage.
- Alarm contact is activated whenever the pH value varies more than 2 pH units from the set point.
- Auxiliary contacts allow the user to attach a mixer or priming pump that is activated only when the pump is dosing.
- Kynar[®], Viton[®] and Teflon[®] materials are used for all parts that come into contact with liquid.

ORDERING INFORMATION:

BL 7916D is supplied with discharge and suction valves, polyethylene tubing, 220/240V power cable and instructions.

BL 7916U is supplied with discharge and suction valves, polyethylene tubing, 110/115V power cable and instructions.

ACCESSORIES:

HI 721101	Pumphead, O-ring and screws
HI 721102	Discharge valve assembly
HI 721103	Suction valve assembly
HI 721004	Injection valve assembly (required)
HI 721005	Foot valve assembly (required)
HI 721008	Ceramic weight (4 pcs.)
HI 7004L	pH 4.01 buffer solution, 500 mL bottle
HI 7007L	pH 7.011 buffer solution, 500 mL bottle
HI 7010L	pH 10.011 buffer solution, 500 mL bottle
HI 767/P	Power plug (5 pcs.)
HI 7671/P	Output plug (5 pcs.)
HI 8427	pH / ORP electrode simulator
HI 931001	pH / ORP electrode simulator with display

For a complete range of pH electrodes, see pages 63-71

SPECIFICATIONS**Range**

0.00 to 14.00 pH

Resolution

0.01 pH

Accuracy (@20°C/68°F)

± 0.01 pH

Flow Rate

see table on page 56

Input Impedance

10^{12} Ohm

Dosage

proportional, acid or base, user selectable

Calibration

offset: ± 1 pH with trimmer; slope: 85 to 115% with trimmer

Recorder Output

4-20 mA (isolated)

Dosing Contact

1 isolated contact, 2A, Max. 240V, resistive load, 1,000,000 strokes

Alarm Contact

1 isolated contact, 2A, Max. 240V, resistive load, 1,000,000 strokes

Power Supply

220/240V $\pm 15\%$; 50/60Hz (40W) 110/115V $\pm 15\%$; 50/60Hz (40W)

Environment

0 to 50°C (32 to 122°F);

RH max 95% non-condensing

Dimensions

181 x 221 x 142 mm (7.1 x 8.7 x 5.6")

Weight

5 kg (11 lb.)

BL 7917 ORP Controller with Dosing Pump

SPECIFICATIONS

Range

-999 mV to +999 mV

Resolution

1 mV

Accuracy (@20°C/68°F)

±5 mV

Flow Rate

see table on page 56

Input Impedance

10¹² Ohm

Dosage

proportional, oxidizing or reducing,
user selectable

Recorder Output

4-20 mA (isolated)

Dosing Contact

1 isolated contact, 2A, Max. 240V, resistive load,
1,000,000 strokes

Alarm Contact

1 isolated contact, 2A, Max. 240V, resistive load,
1,000,000 strokes

Power Supply

220/240V ±15%; 50/60Hz (40W) 110/115V ±15%;
50/60Hz (40W)

Environment

0 to 50°C (32 to 122°F);
RH max 95% non-condensing

Dimensions

181 x 221 x 142 mm (7.1 x 8.7 x 5.6")

Weight

5 kg (11 lb.)



- ORP controller and dosing pump in one compact unit.
- ±5 mV accuracy with unbeatable performance.
- Isolated 4 to 20 mA recorder output.
- Proportional dosing slows the pump down when the measured ORP level approaches the set value which avoids overdosage of oxidizing or reducing agents.
- Alarm contact is activated whenever the ORP reading varies more than 200 mV from the set point.
- Auxiliary contacts allow the user to attach a mixer or priming pump that is activated only when the pump is dosing.
- Kynar®, Viton® and Teflon® materials are used for all parts that come into contact with liquid.

ORDERING INFORMATION:

BL 7917D is supplied with discharge and suction valves, polyethylene tubing, 220/240V power cable and instructions.

BL 7917U is supplied with discharge and suction valves, polyethylene tubing, 110/115V power cable and instructions.

ACCESSORIES:

HI 721101	Pumphead, O-ring and screws
HI 721102	Discharge valve assembly
HI 721103	Suction valve assembly
HI 721004	Injection valve assembly (required)
HI 721005	Foot valve assembly (required)
HI 721008	Ceramic weight (4 pcs.)
HI 7020L	200/275 mV test solution, 500 mL bottle
HI 7091L	Reducing solution, 500 mL bottle
HI 7092L	Oxidizing solution, 500 mL bottle
HI 767/P	Power plug (5 pcs.)
HI 7671/P	Output plug (5 pcs.)
HI 8427	pH / ORP electrode simulator
HI 931001	pH / ORP electrode simulator with display

For a complete range of ORP electrodes, see pages 63-71

Black Stone Chemical Dosing Pumps

Chemical Resistance Guide*

	PVC	PP	Hypalon	Viton®	Kynar®	Teflon®
Acetic Acid, 80%	D	B	A	E	A	A
Bleach	A	B	A	A	A	B
Citric Acid	A	A	A	A	A	A
Copper Cyanide	A	A	X	B	A	A
Copper Sulfate	A	A	B	B	A	A
Ferric Chloride	A	A	B	B	A	A
Ferric Sulfate	A	A	B	B	A	A
Hydrazine	X	X	B	B	A	A
Hydrochloric Acid (concentrated)	A	A	B	B	A	A
Hydrochloric Acid (diluted)	A	A	B	B	A	A
Hydrofluoric Acid (diluted)	D	B	D	A	A	A
Hydrogen Sulfide	C	A	B	B	A	A
Magnesium Nitrate	A	A	A	A	A	A
Magnesium Sulfate	A	A	A	A	A	A
Nitric Acid, 50%	A	C	E	A	A	A
Phosphoric Acid	B	B	A	B	A	A
Plating Baths	A	A	C	A	A	A
Potassium Cyanide	A	A	B	B	A	A
Potassium Nitrate	A	A	B	B	A	A
Propyl Alcohol	C	X	B	B	A	A
Soaps	A	A	B	B	A	A
Sodium Bicarbonate	A	A	A	A	A	A
Sodium Bisulfite	A	A	A	A	A	A
Sodium Hydroxide, 50%	A	A	B	E	A	A
Sodium Hypochlorite, 18%	A	A	A	D	A	A
Sulfuric Acid (concentrated)	A	A	B	A	A	A
Tanning Reagents	A	A	A	X	A	A
Trichlorethane	E	C	E	A	A	A

Symbol Key

A - Excellent B - Good C - Fair
D - Acceptable (limited use) E - Not recommended X - Unknown

*Partial listing

BL Series Dosing Pumps

Part Number	Max Output	Rated Pressure	Dosing Frequency
With Large Diaphragm	lph (gph)	bar	strokes/min
BL20	18.3 (4.8)	0.5	120
BL15	15.2 (4.0)	1	120
BL10	10.8 (2.9)	3	120
BL7	7.6 (2.0)	3	120
With Small Diaphragm			
BL5	5.0 (1.3)	7	120
BL3	2.9 (0.8)	8	120
BL1.5	1.5 (0.4)	13	120

Versatility

Black Stone pumps have been designed to meet the ever changing needs of industry. To accommodate diverse applications, the pumps can be easily mounted anywhere in your plant with their broad, flat base and mounting holes for tank, shelf or floor mounting (horizontal). The rear of the pump housing also provides mounting holes to facilitate vertical mounting: wall, tank or machine.

With the pump valve assembly and unit controls both located on the front of the pump, there is never a problem with installation or flow adjustments.

Simple Operation

Black Stone pumps are equipped with a single control for pump output. The external Flow Rate Control (potentiometer) on the face of the pump allows you to adjust the percentage of flow from 0 to 100% of the pump's rated capacity. This feature eliminates the need to worry about stroke lengths and power settings. An LED indicator lights up each time a stroke begins. This allows the user to assess the stroke rate from a distance.

High Quality Materials

Black Stone pumps have been manufactured with the highest level of mechanical precision, from materials chosen for their inherent ability to resist the effects of aggressive chemicals. When you select a Black Stone pump, you are eliminating the time consuming effort involved in picking the right material for your application. Black Stone pumps are supplied with the highest quality material as standard equipment, not optional. The diaphragm utilizes one-piece construction of Teflon®, which unlike conventional laminated diaphragms will stand up to the test of time and wear. Ball valves are constructed in glass. The pumphead and O-rings are all made of Kynar®, Teflon® and Viton® which offer unsurpassed resistance.

The chemical resistance chart (left) shows how well Kynar® and Teflon® stand up to the most aggressive chemicals.

Rugged Design

Black Stone pumps are completely sealed during assembly and offer IP65 protection against splashes and spills providing excellent protection even in hostile environments.

The fiber-reinforced polypropylene housing stands up to aggressive chemicals while offering superior strength under tough industrial conditions.

Black Stone Chemical Dosing Pumps

SPECIFICATIONS

Max Output

see table on page 60

Pump Casing

fiber-reinforced polypropylene

Materials

pumphead in Kynar®, diaphragm in Teflon®, glass ball valves and O-rings in Viton® polyethylene 5 x 8 mm tubing and 3/8" injection fitting

Self-priming

max height: 1.5 m (5 feet)

Power Supply

110/115 VAC or 220/240 VAC, 50/60Hz

Max Power Consumption

approx. 200 W

Protection

IP65

Environment

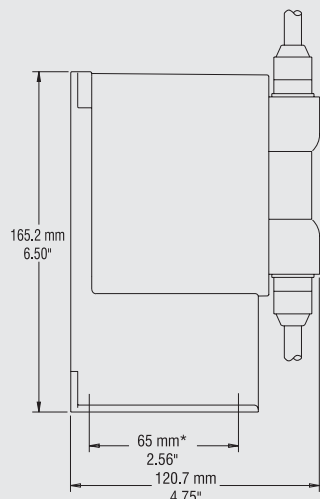
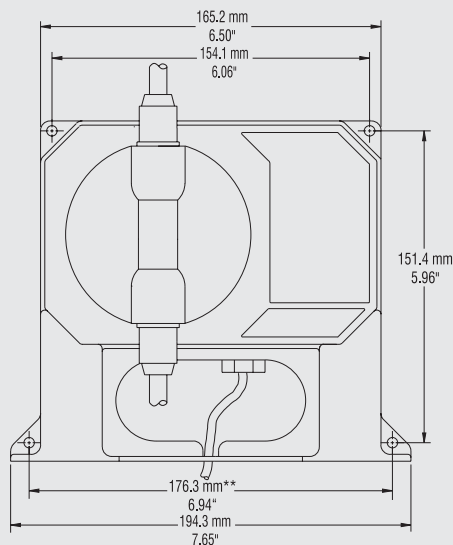
0 to 50°C (32 to 122°F);
RH max 95% non-condensing

Dimensions

165 x 194 x 121 mm (6.5 x 7.6 x 4.8")

Weight

approx. 3 kg (6.6 lb.)



Black Stone's positive displacement solenoid driven pumps use a minimum number of moving parts, therefore reducing the chance of mechanical failure. Part wear and oiling associated with motor driven pumps (ball-bearings, gear drives and cams) are not present in these pumps.

Black Stone pumps are more accurate than standard pumps with the positive displacement design ensuring each stroke is identical to the strokes before and after it, thus keeping the flow rate constant.

A wide range of Black Stone pumps with different dosing capacities is available for your specific dosing needs. Each pump is supplied with discharge and suction valves.

HANNA instruments® also produces polyethylene tubing, injection fittings, ceramic weights and replacement parts.

ORDERING INFORMATION:

BL1.5-1	1.5 LPH flow rate, 110/115 VAC power supply
BL1.5-2	1.5 LPH flow rate, 220/240 VAC power supply
BL3-1	2.9 LPH flow rate, 110/115 VAC power supply
BL3-2	2.9 LPH flow rate, 220/240 VAC power supply
BL5-1	5.0 LPH flow rate, 110/115 VAC power supply
BL5-2	5.0 LPH flow rate, 220/240 VAC power supply
BL7-1	7.6 LPH flow rate, 110/115 VAC power supply
BL7-2	7.6 LPH flow rate, 220/240 VAC power supply
BL10-1	10.8 LPH flow rate, 110/115 VAC power supply
BL10-2	10.8 LPH flow rate, 220/240 VAC power supply
BL15-1	15.2 LPH flow rate, 110/115 VAC power supply
BL15-2	15.2 LPH flow rate, 220/240 VAC power supply
BL20-1	18.3 LPH flow rate, 110/115 VAC power supply
BL20-2	18.3 LPH flow rate, 220/240 VAC power supply

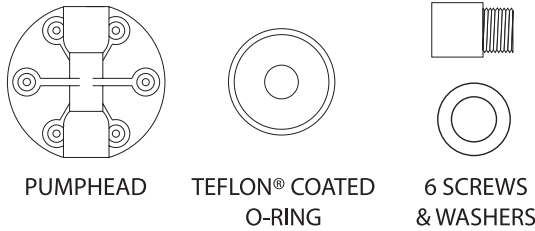
ACCESSORIES:

HI 721101	Pumphead, O-ring and screws
HI 721102	Discharge valve assembly
HI 721103	Suction valve assembly
HI 721004*	Injection valve assembly
HI 721005*	Foot valve assembly
HI 721008	Ceramic weight (4 pcs.)

* Required for operation

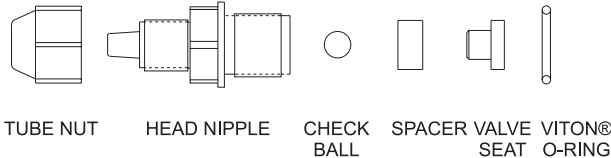
BlackStone Chemical Dosing Pumps

HI 721101



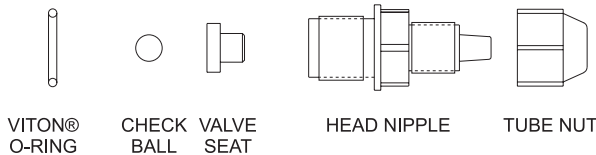
PUMPHEAD TEFLON® COATED O-RING 6 SCREWS & WASHERS

HI 721102



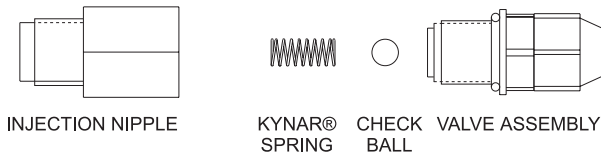
TUBE NUT HEAD NIPPLE CHECK BALL SPACER VALVE SEAT VITON® O-RING

HI 721103



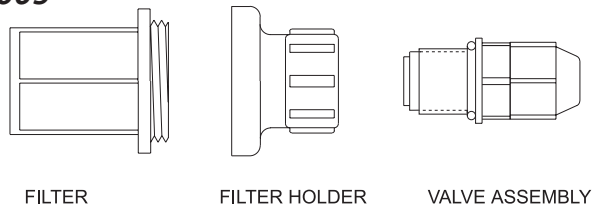
VITON® O-RING CHECK BALL VALVE SEAT HEAD NIPPLE TUBE NUT

HI 721004



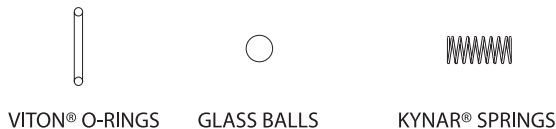
INJECTION NIPPLE KYNAR® SPRING CHECK BALL VALVE ASSEMBLY

HI 721005



FILTER FILTER HOLDER VALVE ASSEMBLY

HI 721003



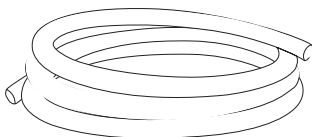
VITON® O-RINGS GLASS BALLS KYNAR® SPRINGS

HI 721006



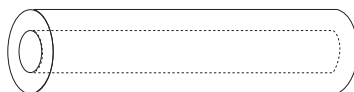
KYNAR® SPRINGS

HI 720032



LPDE HOSE

HI 721008



CERAMIC WEIGHT

REPLACEMENT PARTS

HI 721101

This kit contains the Kynar® pumphead, Teflon® coated O-ring, 6 screws and washers.

HI 721102

This kit contains all the necessary replacement parts for your discharge valve assembly. Complete with a Viton® O-ring, glass valve ball, the valve spacer and seat, head nipple and the tube to secure the assembled parts.

HI 721103

Suction valve assembly, complete with a Viton® O-ring, glass valve ball, valve spacer and seat, head nipple and the tube nut to secure the assembled parts.

HI 721004

Complete with an injection nipple, Teflon® coated spring, glass valve ball and a valve assembly.

HI 721005

This kit contains a filter with a filter holder and a valve assembly.

HI 721003

This kit contains 10 glass balls and valve O-rings.

HI 721006

This kit contains 4 Kynar® springs.

HI 720029

LDPE hose, 3 m (9.9'). Inside diameter 4.71 mm. Outside diameter 7.87 mm

HI 720030

LDPE hose, 10 m (33'). Inside diameter 4.71 mm. Outside diameter 7.87 mm

HI 720031

LDPE hose, 50 m (165'). Inside diameter 4.71 mm. Outside diameter 7.87 mm.

HI 720032

LPDE hose, 100 m (333'). Inside diameter 4.71 mm. Outside diameter 7.87 mm.

HI 721008

This kit contains 4 ceramic weights.

HI 740156

This kit contains 3 valve seats.

HI 1000 Series pH and ORP Flat-Tipped Electrodes

Select the flat tip electrode that best fits your process requirements, by choosing from the following technical characteristics:

1. Junction

Three junction types are available:

- Annular non-clogging Teflon® junction, for testing solutions with high content of suspended solids or for high pressure installation
- Open junction, ideal for waste water analysis
- Ceramic junction

2a. Sensitive Glass Membrane (pH Electrodes)

HANNA instruments® has developed four types of specialized glass. First is an extremely durable sensor glass for general purpose industrial use. This glass can withstand sudden impacts and extreme mechanical stress. The remaining types of electrode glass allow continuous monitoring in highly acidic solutions containing fluoride ions, as well as high or low temperature process streams significantly increasing the electrode life.

2b. ORP Sensor

ORP electrodes are provided with a platinum sensor for most applications, while a gold sensor is required for measurement of cyanide or highly oxidant environments.

3. Temperature Sensor

The pH electrodes with built-in 3-wire Pt100 or Pt1000 temperature sensor allow the temperature compensation of pH readings, as well as temperature measurements.

4. Connection Type

Electrodes can be provided with wire for direct connection to a transmitter or process controller, or with the standard BNC connector.

5. Built-in Amplifier

Models with a built-in amplifier are necessary for long distance measurements, where it is not possible to install a transmitter. The internal amplifier can be powered directly from a HANNA Instruments® process controller.

6. Cable Length

Non-amplified electrodes can be provided with a 5, 10 or 15 meter cable (16, 33 or 49 feet), while the amplified models can be provided with a 15, 25, 50 or 75 meter cable (49, 82, 164 or 246 feet).



- Self-cleaning flat tip sensor
- Significantly reduced maintenance
- Models specially designed for plating baths
- PVDF body
- Three junction types: ceramic, Teflon® and open junction
- Built-in potential matching pin
- Four different glass type pH sensors
- ORP electrodes with platinum or gold sensor
- Models with built-in Pt100 or Pt1000 temperature sensor
- Models with internal amplifier powered by the process controller
- 3/4" NPT external thread on both ends for easy installation

HANNA instruments® presents a new series of combination pH and ORP electrodes, including more than 300 models, incorporating over 20 years of electrode manufacturing experience.

The most advanced feature of this series is the electrode shape with flat tip, which virtually eliminates deposits that can foul the electrode, significantly reducing necessary maintenance. This characteristic makes flat tip electrodes ideal for continuous in-line monitoring, and with solutions containing aggressive chemicals. The PVDF body offers a higher level of mechanical and temperature resistance. Moreover, the PVDF material is non-toxic and compatible with food applications.

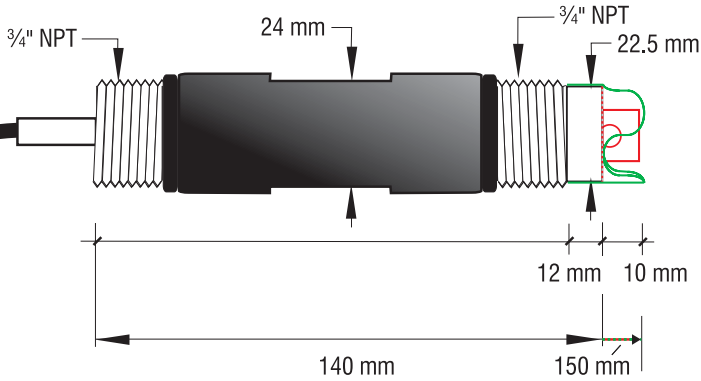
Each pH and ORP electrode is provided with an internal matching pin that can avoid typical problems caused by grounding loop current, such as:

- > progressive damage of the electrode
- > fluctuating measurements
- > poor process regulation

Glass Type	Application	pH Range	Temperature Range
LT	Low Temperature	0 to 12	-10 to 80°C
HT	High Temperature	0 to 14	0 to 100°C
HF	Acid Samples with F- (*)	0 to 10	-5 to 60°C

(*) F- max 2 g/L, temperature max 60°C, pH >2

HI 1000 Series pH and ORP Flat-Tipped Electrodes



pH electrodes/ORP electrodes with Platinum sensor
 pH electrodes with HT type sensor
 ORP electrodes with Gold sensor

ORDERING INFORMATION

HI - Match the numbers below to the corresponding boxes at left according to desired configuration.

Electrode type

- 1006: pH electrodes with Teflon® junction
- 1016: pH electrodes with ceramic junction
- 1026: pH electrodes with open junction (*)
- 2004: ORP electrodes with Teflon® junction
- 2014: ORP electrodes with ceramic junction
- 2024: ORP electrodes with open junction

Sensor type (pH electrodes)

- 1: LT (-10 to 80°C / 23 to 156°F; 0 to 12 pH)
- 2: GP (General Purpose)
- 3: HT (0 to 100°C / 32 to 212°F; 0 to 14 pH)
- 4: HF (Fluoride-resistant) (**)

Sensor type (ORP electrodes)

- 1: Platinum
- 2: Gold

0: BNC connector

- 1: direct wire connection
- 2: BNC + Pt100 temperature sensor (***)
- 3: direct wire + Pt 100 temperature sensor (***)
- 4: BNC + Pt 1000 temperature sensor (***)
- 5: direct wire + Pt1000 temperature sensor (***)
- 6: BNC connector, amplified
- 7: BNC + Pt 100 sensor, amplified (***)

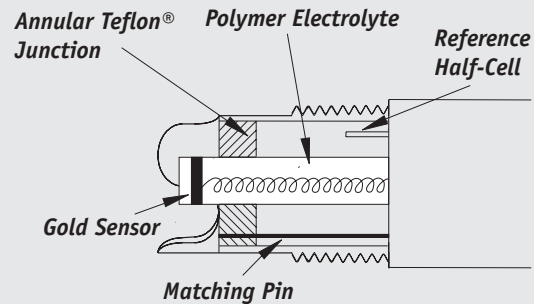
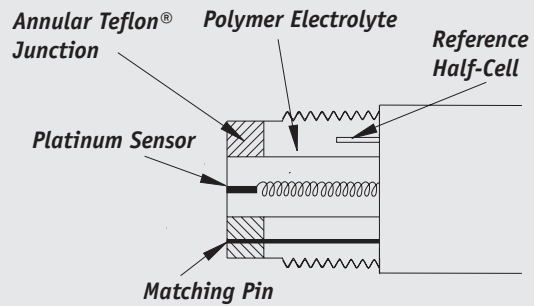
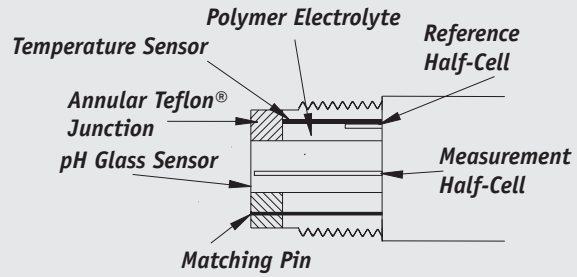
Cable length

- 05, 10, 15 m for non-amplified electrodes
- 15, 25, 50, 75 m for amplified electrodes

(*) Available with GP sensor type only

(**) Fluoride-resistant glass sensor (F<-2g/L, temperature<60°C, pH>2)

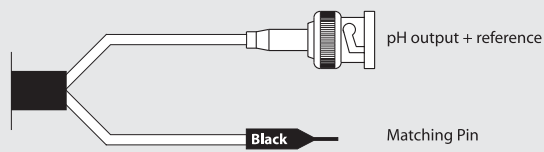
(***) Not for ORP electrodes



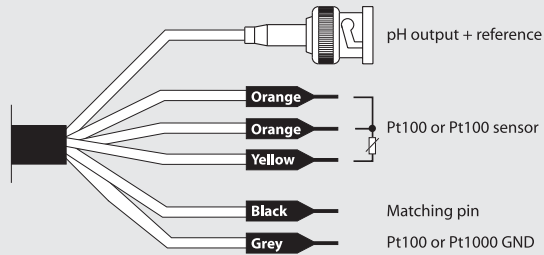
HI 1000 Series pH and ORP Flat-Tipped Electrodes

ELECTRICAL CONNECTIONS

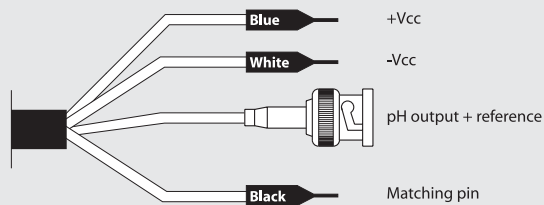
pH & ORP electrodes with BNC connector



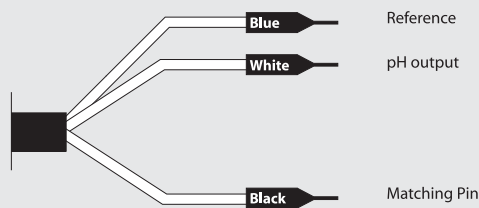
pH electrodes with BNC connector & Pt or Pt1000 temperature sensor



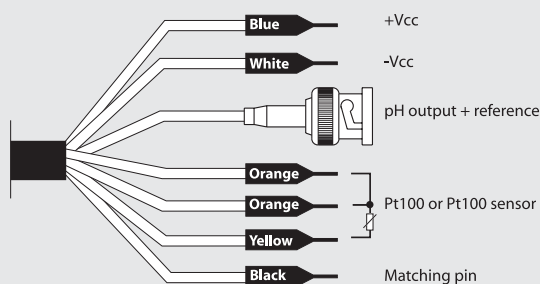
pH & ORP electrodes with BNC connector, amplified



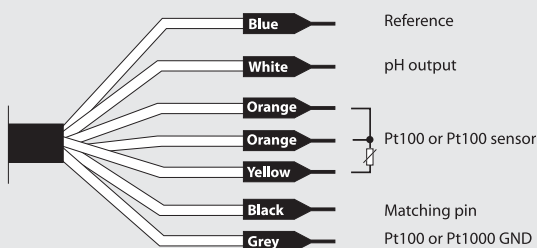
pH & ORP electrodes with direct wire connection



pH electrodes with BNC connector & Pt 100 temperature sensor, amplified



pH electrodes with direct wire connection & Pt or Pt1000 temperature sensor



INSTALLATION

These electrodes have been designed with 3/4" external thread on both ends for easy installation. HANNA instruments® also provides a series of probe holders for in-line, tank or by-pass installations for these electrodes, as shown below.

Front thread 3/4" NPT

- > Direct in-line installation 3/4" standard tee
- > Immersion installation in vessel, tank, plating bath with HI 60501 (PVC) or HI 60503 (PVDF) electrode holders with adjustable immersion level: min 10 cm, max 70 cm
- > Direct pipe installation with HI 60542 PVC electrode holder, 2" thread

Back thread 3/4" NPT

- > Immersion installation with 3/4" threaded pipe
- > By-pass installation with HI 60545 By-pass electrode holder "Loop" configuration Liquid inlet: 3/4" Liquid outlet: 3/4"



Amplified pH and ORP AmpHel® Electrodes: a Breakthrough in Technology

- Strong signal up to 75 meters (246 feet)
- Low noise coaxial cables are no longer required
- Measurements in unclean samples and high humidity conditions
- Models with external replaceable battery, for longer electrode life
- Glass sensor for specific applications

Due to the high resistance of the glass membrane, conventional electrodes require a high impedance measurement system. Inadequate insulation of the connectors and cables result in erroneous readings due to leakage or noise. For conventional electrodes, the lead is therefore limited to typically less than 15-20 meters. HANNA instruments® AmpHel® electrodes incorporate a miniaturized amplifier. This resolves most of the problems associated with high impedance signals. The amplifier circuitry is located right on top of the electrode and is completely sealed. As a result, a strong, low impedance signal is emitted and ordinary connectors with long unshielded cables can be used. This breakthrough technology provides a stable signal for industrial monitoring as well as a major saving in low noise coaxial cable costs. In some cases, the need for a transmitter is also eliminated, resulting in further cost reductions. For those applications that have proven particularly hostile to electrodes, HANNA instruments® has developed four types of specialized glass. First is an extremely durable sensor glass for general purpose, industrial use. This glass can withstand sudden impacts and extreme mechanical stress. The remaining types of electrode glass allow continuous monitoring in highly acidic solutions containing fluoride ions, as well as high or low temperature process streams, without significantly reducing the useful life of the electrode. Electrode body material is glass or Ultem®, while the junction is cloth or Teflon®.

**Extend Electrode Life**

With the new AmpHel® replaceable battery model, it is no longer necessary to throw away an electrode when the battery is exhausted.

Glass Type	Application	pH Range	Temperature Range
LT	Low Temperature	0 to 12	-10 to 80°C
HT	High Temperature	0 to 14	0 to 100°C
HF	Acid Samples with F- (*)	0 to 10	-5 to 60°C

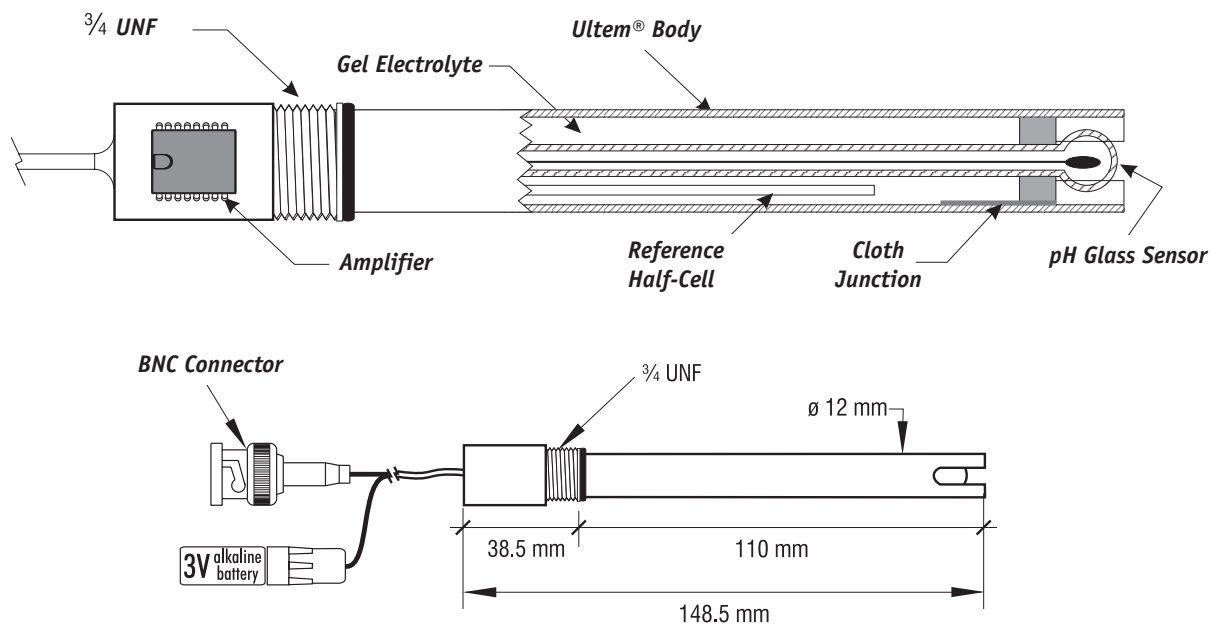
INSTALLATION

Easy installation of these electrodes is possible thanks to the 3/4" UNF external thread. Models with glass body and Teflon® junctions are recommended for in-line installations. Models with an Ultem® body and cloth junction are suitable for tank monitoring or for use with portable meters, where the electrode can be easily accessed for maintenance.

Front thread 3/4" UNF

- > Direct in-line installation Electrode holder: HI 6054B
- > Immersion installation Electrode holder: HI 6050 (0.5 m); HI 6051 (1.0 m); HI 6052 (1.5 m)

Amplified pH and ORP AmpHel® Electrodes: a Breakthrough in Technology



AmpHel® pH Electrodes with Replaceable Battery

General Purpose pH Electrodes

Code	Body	Junction	Electrolyte	Glass Type	Temperature	Max Pressure	Connector	Cable
HI 6291005	Ultem®	cloth	gel	GP	-5 to 80 °C	3 bar	BNC	5 m

Low Temperature pH Electrodes

Code	Body	Junction	Electrolyte	Glass Type	Temperature	Max Pressure	Connector	Cable
HI 5291005	Ultem®	cloth	gel	LT	-10 to 80 °C	3 bar	BNC	5 m

High Temperature pH Electrodes

Code	Body	Junction	Electrolyte	Glass Type	Temperature	Max Pressure	Connector	Cable
HI 8299505	glass	Teflon®	polymer	HT	0 to 100 °C	3 bar	BNC	5 m

pH Electrodes for Acid Samples with Fluoride Ions (F⁻ max 2 g/L, temperature max 60 °C, pH >2)

Code	Body	Junction	Electrolyte	Glass Type	Temperature	Max Pressure	Connector	Cable
HI 7291005	Ultem®	cloth	gel	HF	-5 to 60 °C	3 bar	BNC	5 m
HI 7299505	glass	Teflon®	polymer	HF	-5 to 60 °C	3 bar	BNC	5 m

AmpHel® pH with Internal Battery

Code	Body	Junction	Electrolyte	Glass Type	Temperature	Max Pressure	Connector	Cable
HI 2910B/5	Ultem®	cloth	gel	GP	-5 to 80 °C	3 bar	BNC	5 m
HI 2911B/5	Ultem®	Teflon®	polymer	GP	-5 to 80 °C	3 bar	BNC	5 m

AmpHel® ORP Electrodes with Replaceable Battery

Code	Body	Junction	Electrolyte	Glass Type	Temperature	Max Pressure	Connector	Cable
HI 6293005	Ultem®	cloth	gel	platinum	-5 to 80 °C	3 bar	BNC	5 m
HI 6493005	Ultem®	cloth	gel	gold	-5 to 80 °C	3 bar	BNC	5 m

AmpHel® ORP Electrodes with Internal Battery

Code	Body	Junction	Electrolyte	Glass Type	Temperature	Max Pressure	Connector	Cable
HI 2930B/5	Ultem®	cloth	gel	platinum	-5 to 80 °C	3 bar	BNC	5 m
HI 2931B/5	Ultem®	Teflon®	gel	platinum	-5 to 80 °C	3 bar	BNC	5 m

ACCESSORIES:

HI 740031 Spare replaceable battery for AmpHel® electrodes

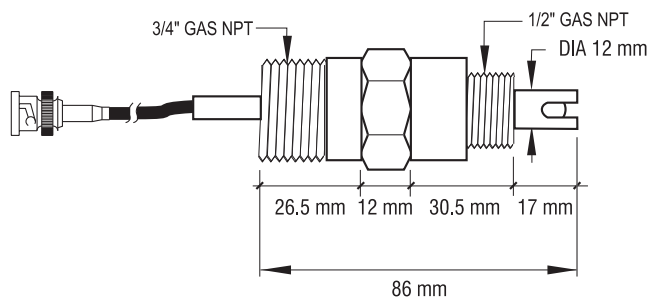
HI 1000 • HI 2000 Series: pH and ORP Electrodes for Continuous Flow-thru Monitoring

- 1/2" NPT external thread for in-line installation
- pH electrode with exclusive Teflon® non-clogging membrane
- Double-junction technology
- PVDF body
- Models with built-in matching pin and amplifier

In order to reduce normal contamination coming from industrial use, these electrodes combine a polymer reference and double-junction technology: no refilling is required, and the electrode can be used in samples such as organic compounds, proteins and heavy metals. In addition, the pH electrodes use a unique annular Teflon® junction that minimizes clogging. These industrial probes have a glass body electrode for use in aggressive chemicals and are easy to clean. An Ultem® protective sleeve gives the electrodes resistance against mechanical stress. Operating limits are -5 to 80°C (23 to 176°F) and pressure up to 6 bar (87 psi).

Some models, both pH and ORP, are provided with built-in matching pin. Others also feature a built-in amplifier, which allows measurements far from the location of the instrument without requiring a transmitter.

HI 1000 and HI 2000 series come with BNC connector that makes connection to any pH/ORP meter quick and easy; models with 3 or 5 meters (9.8 or 16 feet) cable are available.

**INSTALLATION**

These sensors have a hex-shaped body for easy installation, requiring no special tools. Continuous in-line mounting is possible thanks to the 1/2" external thread. No special holders are required: HI 1000 and HI 2000 series can be used with any standard 1/2" pipe tee available on the market. On the opposite end, these probes are provided with a 3/4" thread so that they can be attached to a pipe for dip applications.

Front thread 1/2" NPT

- > Direct in-line installation
1/2" standard tee

Back thread 3/4" NPT

- > Immersion installation
3/4" threaded pipe

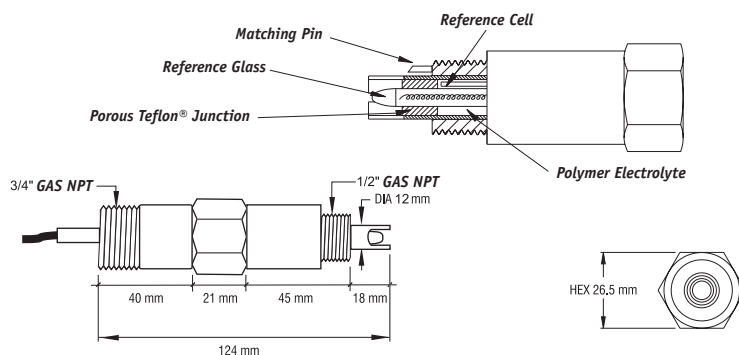
**Matching Pin**

Matching pin with differential input for grounding.

HI 1001 (pH Electrode) and HI 2001 (ORP Electrode with Pt Sensor)

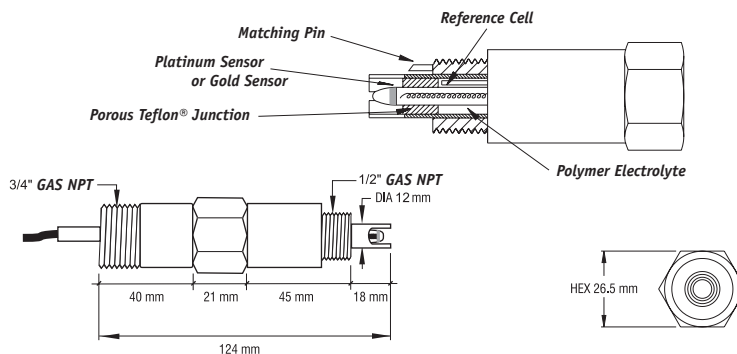
Code	Junction	Electrolyte	Temperature	Max Pressure	Connector	Cable
HI 1001	double, Teflon®	polymer	-5 to 80 °C	6 bar	BNC	3 m
HI 2001	double, Teflon®	polymer	-5 to 80 °C	6 bar	BNC	3 m

HI 1000 • HI 2000 Series: pH and ORP Electrodes for Continuous Flow-thru Monitoring



HI 1000 Series: pH Electrodes

Code	Junction	Electrolyte	Matching Pin	Amplifier	Temperature	Max Pressure	Connector	Cable
HI 1002/3	double, Teflon®	polymer	—	—	-5 to 80 °C	6 bar	BNC	3 m
HI 1002/5	double, Teflon®	polymer	—	—	-5 to 80 °C	6 bar	BNC	5 m
HI 1003/3	double, Teflon®	polymer	yes	—	-5 to 80 °C	6 bar	BNC	3 m
HI 1003/5	double, Teflon®	polymer	yes	—	-5 to 80 °C	6 bar	BNC	5 m
HI 1004/5	double, Teflon®	polymer	yes	yes	-5 to 80 °C	6 bar	spade lug	5 m



HI 2000 Series: ORP Electrodes with Platinum Sensor

Code	Junction	Electrolyte	Matching Pin	Amplifier	Temperature	Max Pressure	Connector	Cable
HI 2002/3	double, Teflon®	polymer	—	—	-5 to 80 °C	6 bar	BNC	3 m
HI 2002/5	double, Teflon®	polymer	—	—	-5 to 80 °C	6 bar	BNC	5 m
HI 2003/3	double, Teflon®	polymer	yes	—	-5 to 80 °C	6 bar	BNC	3 m
HI 2003/5	double, Teflon®	polymer	yes	—	-5 to 80 °C	6 bar	BNC	5 m
HI 2004/5	double, Teflon®	polymer	yes	yes	-5 to 80 °C	6 bar	spade lug	5 m

HI 2000 Series: ORP Electrodes with Gold Sensor

Code	Junction	Electrolyte	Matching Pin	Amplifier	Temperature	Max Pressure	Connector	Cable
HI 2012/3	double, Teflon®	polymer	—	—	-5 to 80 °C	6 bar	BNC	3 m
HI 2012/5	double, Teflon®	polymer	—	—	-5 to 80 °C	6 bar	BNC	5 m
HI 2013/3	double, Teflon®	polymer	yes	—	-5 to 80 °C	6 bar	BNC	3 m
HI 2013/5	double, Teflon®	polymer	yes	—	-5 to 80 °C	6 bar	BNC	5 m
HI 2005/5	double, Teflon®	polymer	yes	yes	-5 to 80 °C	6 bar	spade lug	5 m

pH and ORP Electrodes with Quick and Easy BNC Connection

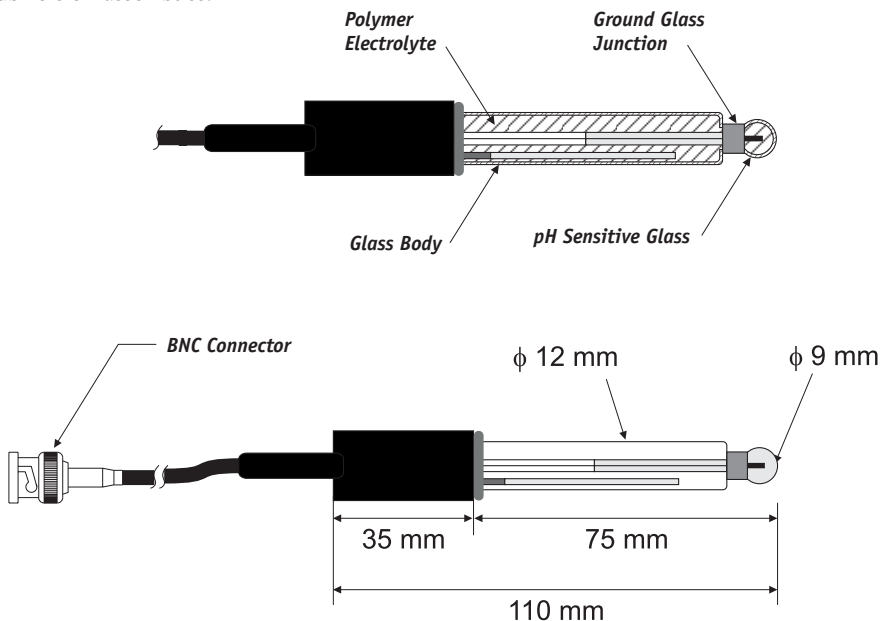


- BNC connector
- Submersion and in-line installation capability
- Ultem® and glass body

HANNA instruments® offers a wide range of combination pH and ORP electrodes specifically designed for needs of industrial users. In order to reduce contamination problems, all electrodes are gel or polymer filled and feature double-junction technology.

The BNC connector allows quick and easy connection to any pH/ORP meter or transmitter. In addition, all electrodes with BNC connector are provided with 3/4" UNF thread for secure in-line installation. The range includes Ultem® and glass body electrodes: the former are rugged and suitable for applications in which the capability to resist stress is needed; the latter are recommended for use in aggressive chemicals and are easier to clean.

All pH and ORP electrodes can be mounted with the HANNA instruments® in-line and submersion assemblies.



Combination Glass-body pH Electrode

Code	Junction	Electrolyte	Temperature	Max Pressure	Connector	Cable
HI 1090B/5	double, ground glass	polymer	-5 to 95 °C	3 bar	BNC	5 m

INSTALLATION

The installation of these electrodes is very flexible, because you can choose different mounting configurations. Models with glass body and no external thread can be installed on tanks using the HI 6050 electrode holder with sealing O-ring. Models with Ultem® body and 3/4" UNF thread or glass body and no thread can be easily installed directly in-line, using a T shape electrode holder, such as HI 6054B.

Glass body

No thread

Body length: 75 mm

- > Immersion installation
Electrode holder
HI 6050 (0-5 m)
HI 6051 (1-0 m)
HI 6052 (1-5 m)

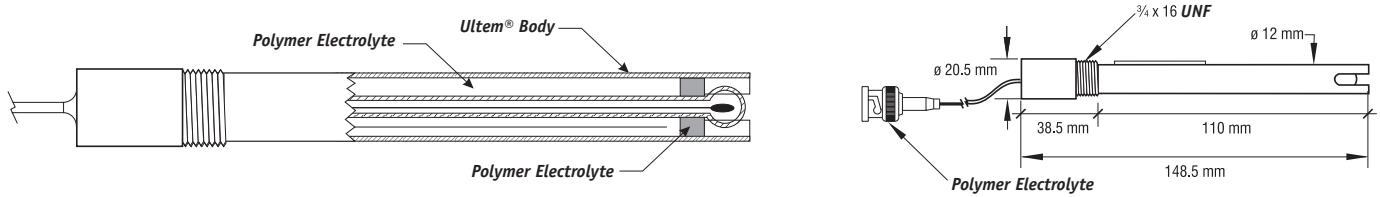
Ultem® body

Threaded head

3/4" x 16 UNF

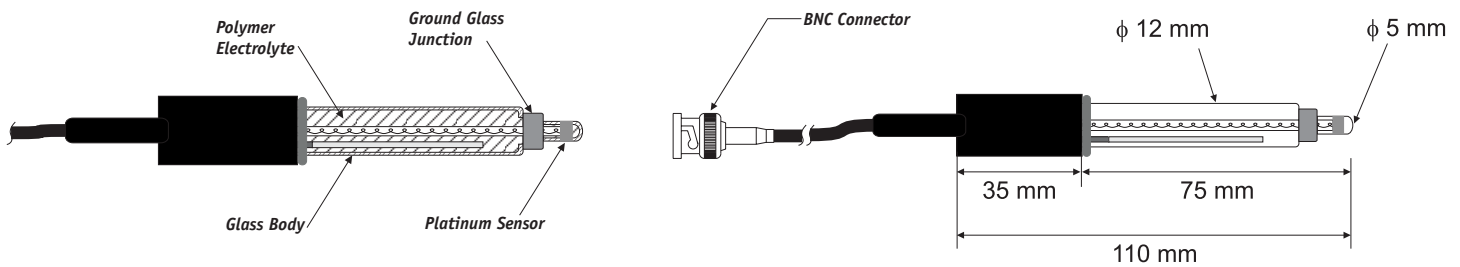
- > Direct in-line installation
Electrode holder
HI 6054B
- > Immersion installation
Electrode holder
HI 6050 (0-5 m)
HI 6051 (1-0 m)
HI 6052 (1-5 m)

pH and ORP Electrodes with Quick and Easy BNC Connection



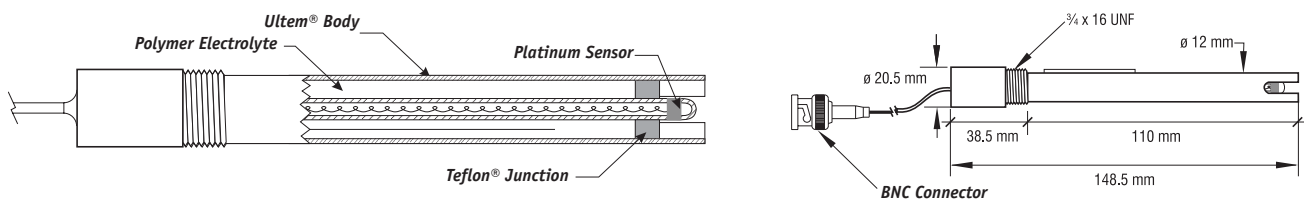
Combination Ultem® body pH Electrode

Code	Junction	Electrolyte	Temperature	Max Pressure	Connector	Cable
HI 1210B/5	double, Teflon®	polymer	-5 to 80 °C	3 bar	BNC	5 m



Combination Glass-body ORP Electrode with Platinum Sensor

Code	Junction	Electrolyte	Temperature	Max Pressure	Connector	Cable
HI 3290B/5	double, ground glass	polymer	-5 to 95 °C	3 bar	BNC	5 m

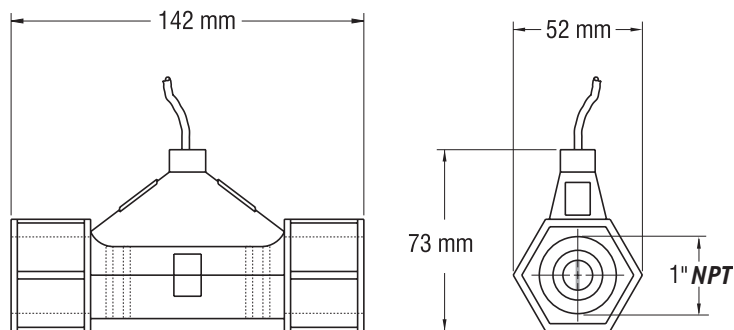


Combination ORP Electrode with Platinum Sensor

Code	Junction	Electrolyte	Temperature	Max Pressure	Connector	Cable
HI 3210B/5	double, Teflon®	polymer	-5 to 80 °C	3 bar	BNC	5 m

Conductivity Probes for Industrial Applications

HI 7635 • HI 7636 In-line Probes



HI 7635 and HI 7636 In-line Probes

Code	Temperature Compensation	Body	Operating Temperature	Max Pressure (@25°C/77°F)
HI 7635	automatic, 0 to 50°C with NTC Sensor	polypropylene	0 to 80°C (32 to 176°F)	5 bar
HI 7636	N/A	polypropylene	0 to 80°C (32 to 176°F)	5 bar

The wide range of HANNA instruments® conductivity probes includes models for industrial applications. Flow-thru and dip versions are available.

These conductivity probes combine the proven 4-ring potentiometric method of measuring conductivity with platinum sensors. The universally acclaimed 4-ring method provides a more stable measurement over a wider range. The probe does not suffer polarization, nor does it need frequent calibration or cell changes.

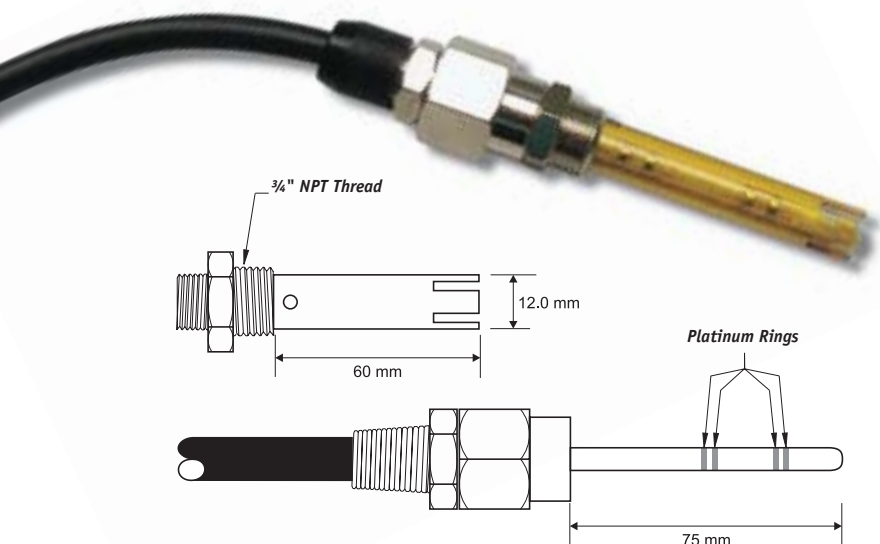
In addition, the built-in temperature sensor allows automatic temperature compensation of measurements.

These probes have been designed for easy operation and maintenance.

The 4 m cable is provided with color coded wires for easy connection to the HI 8936 transmitters (page 49).

HI 7638 • HI 7639 • HI 7640

Conductivity Probe with Platinum Rings



HI 7638, HI 7639 and HI 7640 Conductivity Probes with Platinum Rings

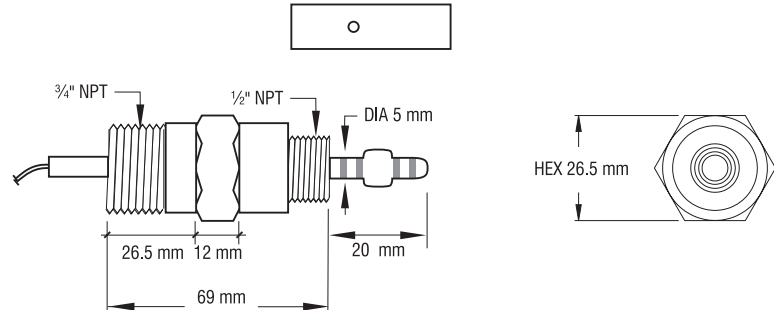
Code	Temperature Compensation	Body	Operating Temperature	Max Pressure (@25°C/77°F)
HI 7638	automatic, 0 to 50°C with NTC Sensor	Ultem® and glass	0 to 120°C (32 to 248°F)	5 bar
HI 7639	automatic, 0 to 50°C with Pt100 Sensor	Ultem® and glass	0 to 120°C (32 to 248°F)	5 bar
HI 7640	N/A	Ultem® and glass	0 to 120°C	5 bar

Conductivity Probes for Industrial Applications

HI 3001 • 3001D • HI 3011 Flow-thru Probes

These 4-ring probes measure conductivity with platinum sensors. They come with standard 1/2" external thread for flow-thru mounting and 3 m (9.9') of cable. The protective cover is made of Ultem® and can be removed for quick maintenance. These probes can withstand temperatures up to 80°C (176°F) and 6 bars (87 psi) of pressure. In addition, HI 3001 houses an NTC sensor for automatic temperature compensation.

A new model is also available: HI 3001D with DIN connector, to be used with the HI 99xx series of wall mounted controllers.



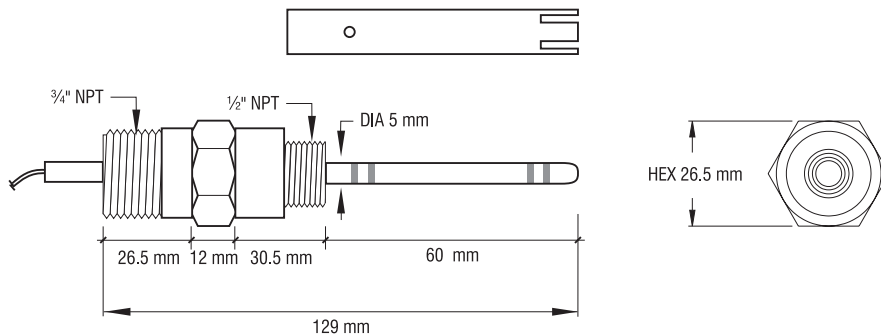
HI 3001, HI 3001D and HI 3011 Flow-thru Probes

Code	Temperature Compensation	Body	Operating Temperature	Max Pressure (@25°C/77°F)
HI 3001/ HI 3001D	automatic, 0 to 60°C with NTC Sensor	Ultem® and PDVF	0 to 80°C (32 to 176°F)	6 bar
HI 3011	N/A	Ultem® and PDVF	0 to 80°C (32 to 176°F)	6 bar

HI 3002 • HI 3012 Submersion Probes

The HI 3002 and HI 3012 4-ring probes measure conductivity with platinum sensors and come with standard 1/2" external thread for submersion applications and 3 m (9.9') of cable. The protective cover is made of Ultem® and can be removed for quick maintenance. The new probes can withstand temperatures up to 80°C (176°F) and 6 bars (87 psi) of pressure.

HI 3002 also houses an NTC temperature sensor for automatic temperature compensation.



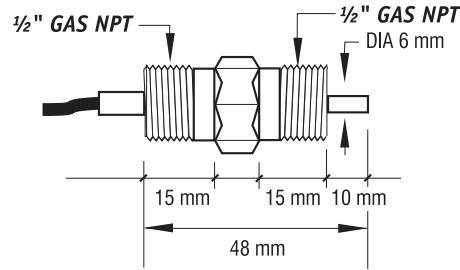
HI 3002 and HI 3012 Submersion Probes

Code	Temperature Compensation	Body	Operating Temperature	Max Pressure (@25°C/77°F)
HI 3002	automatic, 0 to 60°C with NTC Sensor	Ultem® and PDVF	0 to 80°C (32 to 176°F)	6 bar
HI 3012	N/A	Ultem® and PDVF	0 to 80°C (32 to 176°F)	6 bar

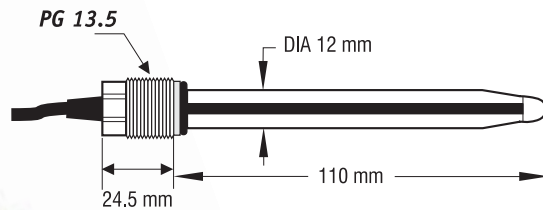


Temperature Probes for Industrial Applications

HI 7610 • HI 7611



HI 7620 • HI 7621



- Flow-thru and immersion mounting
- High accuracy
- Stainless steel model with 1/2" GAS NPT external thread
- Glass version with high chemical resistance and PG 13.5 external thread

HANNA instruments® presents temperature probes with 3-wire Pt100 or Pt1000 sensor. These probes provide an accurate and effective way of measuring and compensating for temperature. They can be used with a vast array of industrial pH, ORP and conductivity controllers on the market, as well as our pH 500, mV 600, HI 700 & HI 504 series.

HI 7610 and HI 7611 are constructed of stainless steel for additional ruggedness. They incorporate 1/2" external threads on both ends to facilitate inline and immersion installations.

HI 7620 and HI 7621 are made with a glass body in order to provide greater resistance against aggressive chemicals. They also come with a standard PG 13.5 external thread so that they may be used with our HI 6054T holder, illustrated on page 77 as well as other common probe holders.

HI 7610, HI 7611 HI 7620 and HI 7621 Industrial Temperature Probes				
Code	Temperature Sensor	Body	Max Pressure	Cable Length
HI 7610	Pt 100	stainless steel	8 bar	5 m (16.4')
HI 7611	Pt 1000	stainless steel	8 bar	5 m (16.4')
HI 7620	Pt 100	glass	3 bar	5 m (16.4')
HI 7621	Pt 1000	glass	3 bar	5 m (16.4')

Electrode Holders and Accessories

SPECIFICATIONS

Electrode Holder Material

PVC

O-ring Material

NBR (Buna N)

Minimum Temperature

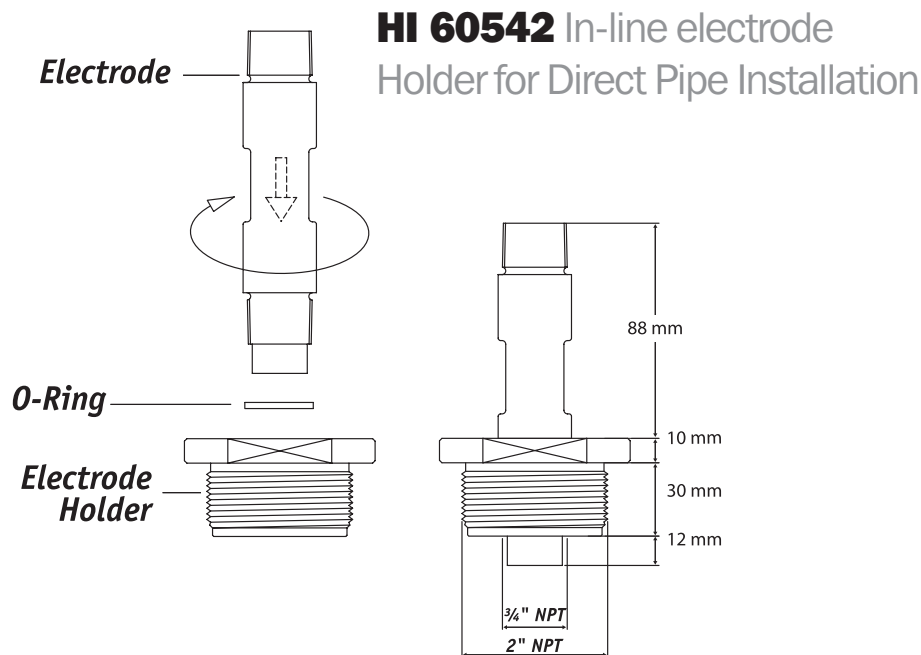
-10 °C

Maximum Temperature

+60 °C

Maximum Pressure

8 bar @25°C or 3 bar @50°C



HI 60542 is a 2 inch NPT in-line PVC electrode holder ideal for installation directly in a pipe. HI 60542 has been designed specifically to be used with HANNA instruments® 3/4" NPT process electrodes with built-in temperature sensor and matching pin.

ACCESSORIES:

HI 60542-0 1 set of O-rings

SPECIFICATIONS

Electrode Holder Material

PVC

O-ring Material

NBR (Buna N)

Minimum Temperature

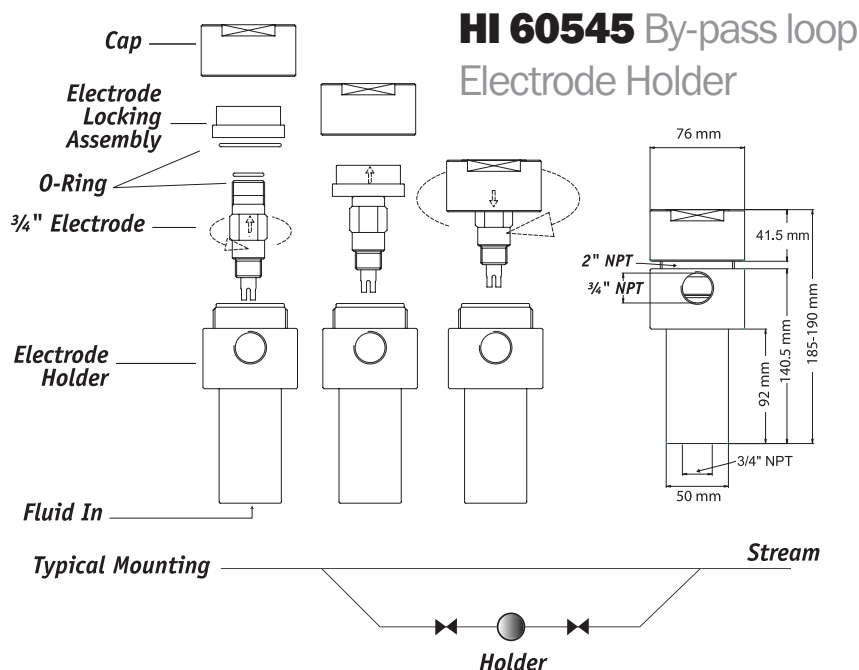
-10 °C

Maximum Temperature

+60 °C

Maximum Pressure

8 bar @25°C or 3 bar @50°C



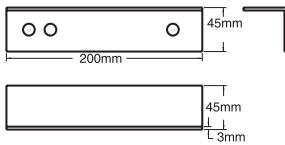
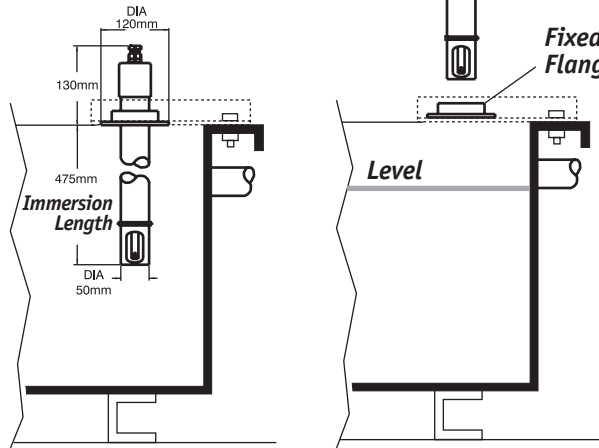
HI 60545 is an electrode holder designed for use in a bypass loop configuration. HI 60545 allows easy maintenance and calibration without shutting down the process. The design of HI 60545 assures that the glass sensor remains wet even when system is not under pressure. HI 60545 is only for use with HANNA instruments® 3/4" NPT process electrodes with built-in temperature sensor and matching pin.

ACCESSORIES:

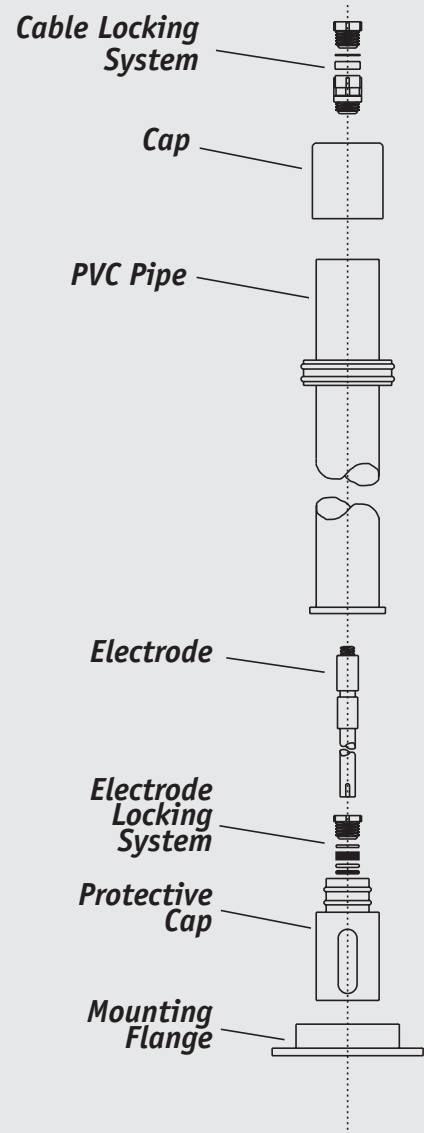
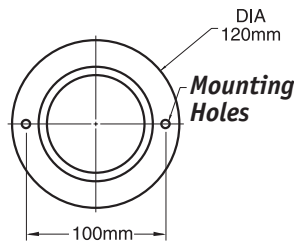
HI 60545-0 1 set of O-rings

HI 6050 Submersible Electrode Holder

Removable electrode holder will slide in and out of mounting flange without the need for tools



Suggested dimensions of stainless steel mounting brackets to mount the flange onto the tank



These electrode mounting systems are constructed in rugged PVC and will resist most of the chemicals associated with waste water treatment. They are easy to install and require no tools for maintenance, making weekly electrode inspection and meter calibration a quick and easy task.

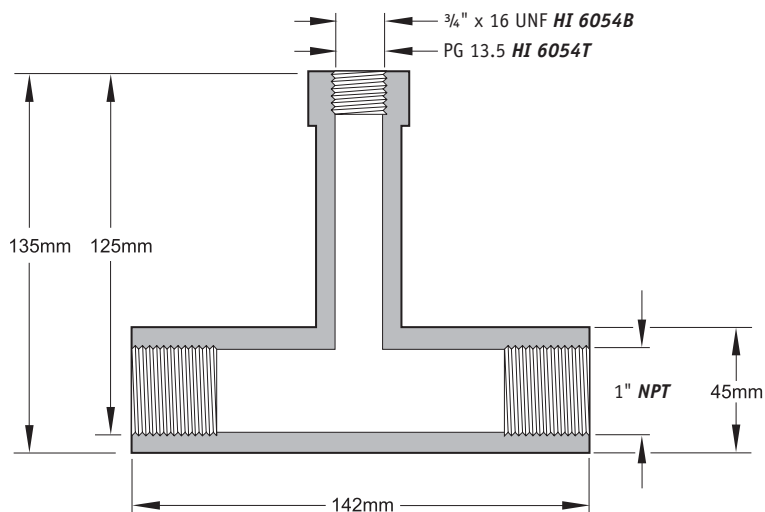
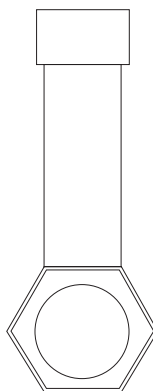
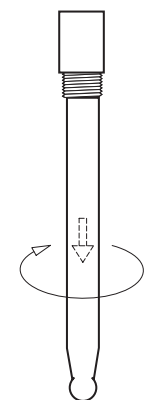
The mounting flange is a rugged PVC piece that mounts directly to the stainless steel brackets on your tank. The figure above illustrates the suggested bracket dimensions used for mounting. Once mounted to your tank, the electrode holder is a sturdy, protective housing that will extend the life of your electrodes. The electrode slides into the holder and is hand tightened into place. The cable from the electrode will lead up through the holder and out through the cap on top. The cable is also shielded inside the holder to prevent any damage to the insulation. The protective cap is removable to allow for quick and simple electrode maintenance and replacement.

Specifications

Code	Total Length	Weight	Submersion Length
HI 6050	605 mm (23.8")	0.8 kg (26 oz.)	475 mm (18.7")
HI 6051	1105 mm (43.5")	1.2 kg (44 oz.)	975 mm (38.4")
HI 6052	1605 mm (63.2")	2.0 kg (71 oz.)	1500 mm (59.1")

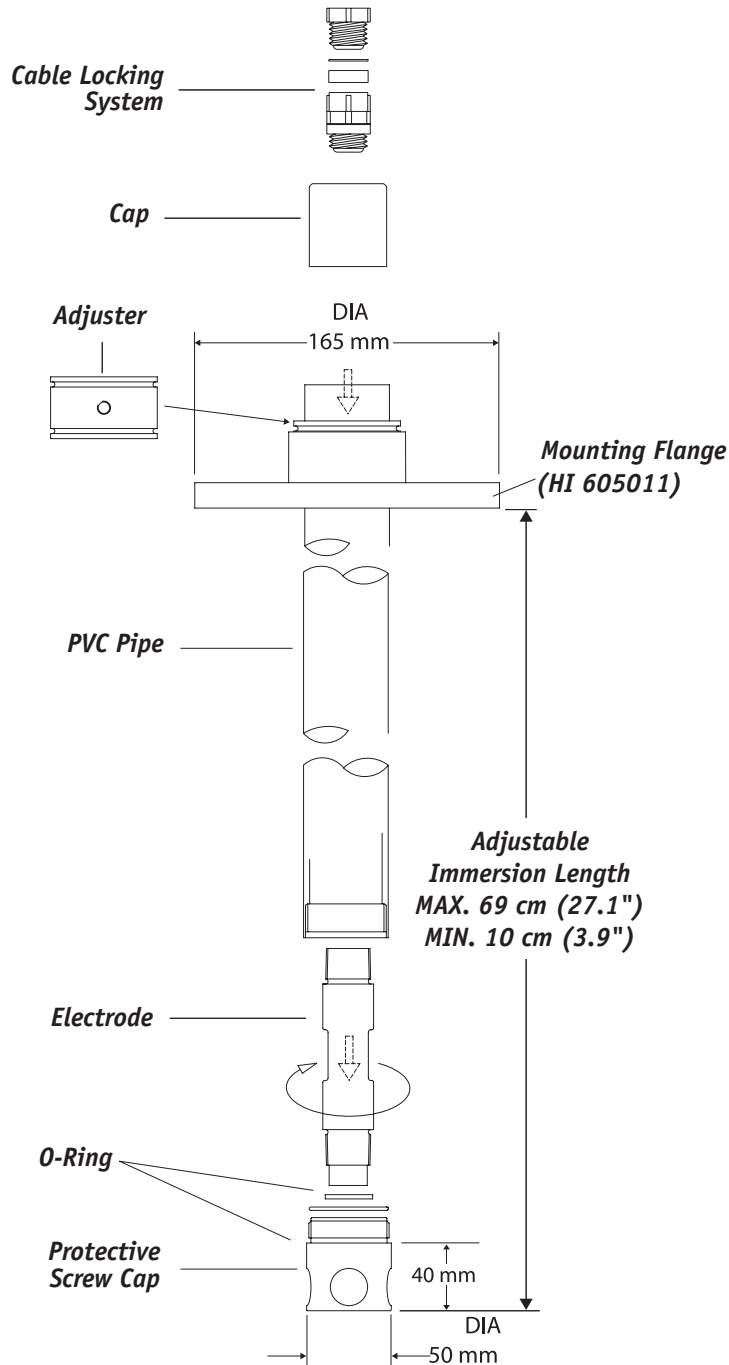
HI 6054B • HI 6054T Electrode Holders for In-line Applications

The HI 6054 is a rugged, fiber-reinforced polypropylene in-line electrode holder. Simply install the holder in the line so that liquid will always be present inside the holder. Once installed, the electrode will remain in contact with the fluid at all times, allowing the most accurate readings possible. The HI 6054B and HI 6054T are designed specifically to work with HANNA instruments® electrodes with external thread of $\frac{3}{4}$ " x 16 UNF and PG 13.5 respectively.



HI 60501 • HI 60503 Immersion Electrode Holders

These electrode holders are adjustable length and have been designed designed for immersion applications. Simply set the flange adjuster and flange (HI 605011) to required length and install. These holders have been designed specifically to be used with HANNA instruments' 3/4" process electrodes with built-in temperature sensor and matching pin.



SPECIFICATIONS

Electrode Holder Material

HI 60501: PVC

HI 60503: PVDF

O-ring Material

NBR (Buna N)

Minimum Immersion Level

10 cm (3.9")

Maximum Immersion Level

69 cm (27.1")

Minimum Temperature

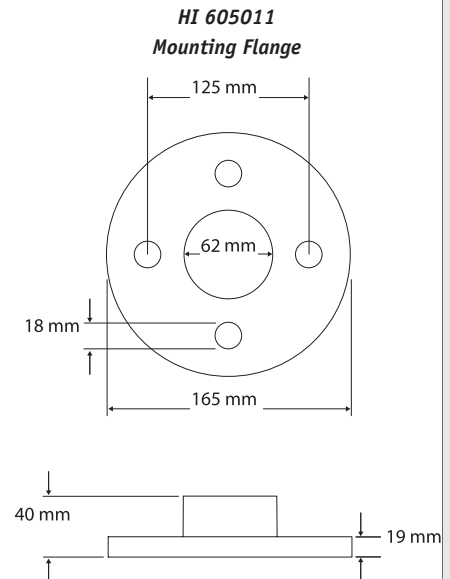
HI 60501: -10°C (14°F)

HI 60503: -15°C (5°F)

Maximum Temperature

HI 60501: +60°C (140°F)

HI 60503: +100°C (212°F)



ACCESSORIES:

HI 605011 PVC mounting flange

HI 60501-0 1 set of O-rings

PCA 310 • PCA 320 • PCA 330 Chlorine, pH, ORP and Temperature Analyzers

Chlorine Monitoring

Chlorine is the most commonly used water disinfectant in applications that vary from treatment of drinking and waste water to pool and spa sanitization. The chlorine present in the water binds itself with bacteria, leaving only a part of the original quantity (free chlorine) to continue its disinfecting action. The monitoring and control of chlorine levels has an important bearing on public health in applications such as drinking water and return on investment and efficiency for heating systems and industry. Too much chlorine will generate unpleasant odor and taste, or can even be harmful, while too little can prove ineffective. HANNA instruments® completes its range of Chlorine Meters, by offering the PCA series Chlorine Analyzers & Controllers. These microprocessor-

based process instruments can continuously monitor a sample stream for Free Chlorine or Total Chlorine content in the 0 to 5 mg/L range with a 0.01 resolution. The principle of operation is based on an adaptation of the EPA recommended DPD 330.5 method.

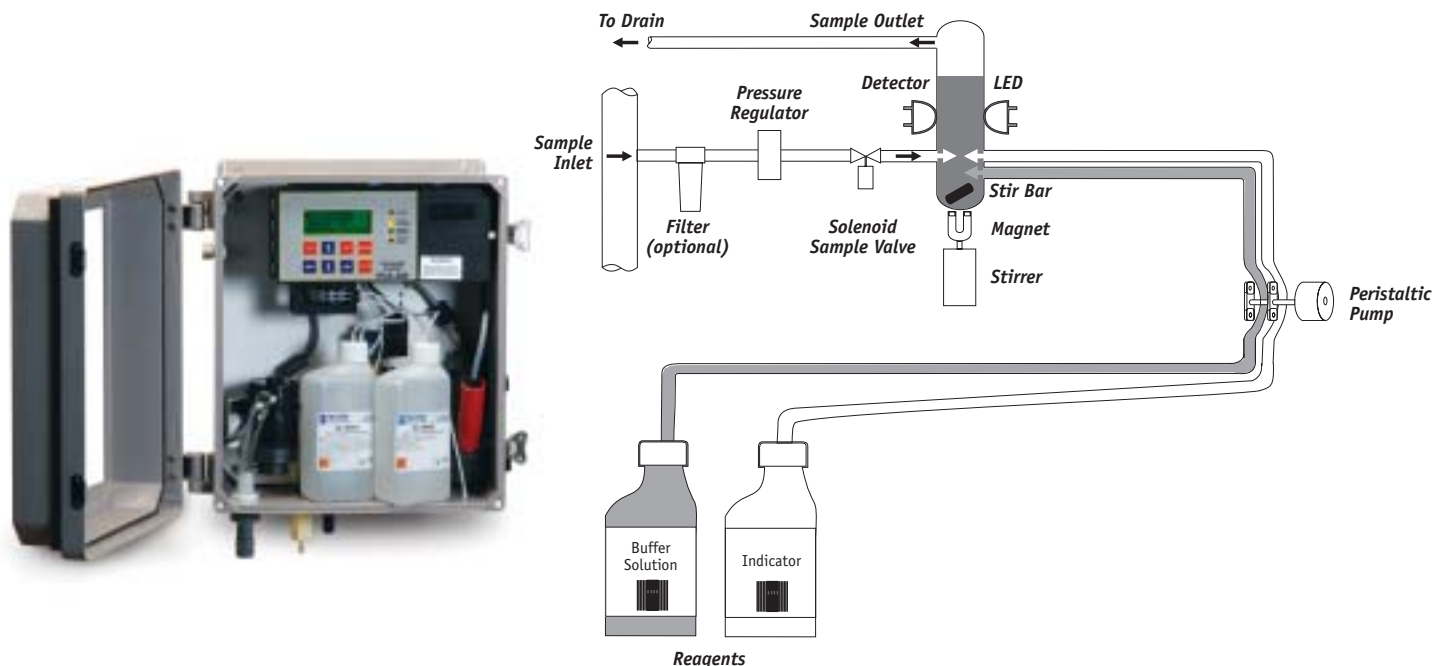
Indicator and buffer reagent bottles are placed directly into the instrument case. Using a sampling period of 10 minutes, reagents need not be replenished for months. The reagent bottles are also visible through the transparent window. The operator can select the set point which will activate chlorine dosing when the measurement is below the set point. The alarm can be also set above or below the set point. The set point controls a relay which can perform

proportional dosage with a user-selectable delta from 0.1 to 5.0 mg/L. HANNA instruments® has designed our new chlorine analyzers PCA 320 & PCA 330 respectively with pH/temperature and pH/ORP/temperature control. These two new models also allow pH regulation through acid or alkaline dosage with both ON/OFF and proportional modes. All measured parameters can be sent through SMS to a cellular phone using the optional GSM module. The external enclosure of the instruments meet the NEMA 4X standards: molded fiberglass polyester giving outstanding chemical and temperature resistance. External mounting feet provide easy installation and the front door gasket protects the unit from water, humidity and dust.



Method of Analysis

In the DPD Colorimetric method, N, N-Diethyl-p-phenylene-Diamine indicator and a buffer are mixed with the sample. Free available chlorine oxidizes the DPD indicator reagent at a pH between 6.3 and 6.6 to form a magenta colored compound. The intensity of the resulting color is proportional to the concentration of chlorine in the sample. The purpose of the buffer solution is to maintain the proper pH. In total chlorine measurement (free available chlorine plus combined chloramines), potassium iodide is added. The chloramines in the sample cause the iodide ions to become iodine which reacts with free chlorine to oxidize the DPD indicator. A pH of 5.1 is required for this reaction. Thus total chlorine measurements require a different buffer solution containing potassium iodide. Once the chemical reaction is completed, the optical signal at 555 nm is compared to the signal measured through the sample before the reagents were added. From these measurements chlorine concentration is calculated and shown on the display.

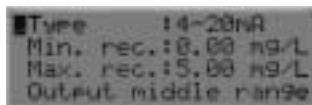


PCA 310 • PCA 320 • PCA 330 Chlorine, pH, ORP and Temperature Analyzers

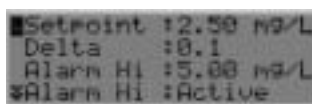
- pH regulation with both ON/OFF and proportional controls
- Separate alarms can be set for pH and chlorine controls
- Parameters can be sent through SMS
- Large graphical display with backlight
- User-friendly interface
- Can store up to 3500 data, that can be displayed or downloaded to a PC



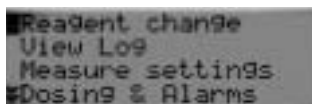
Large graphical display with backlight



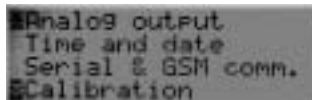
Recorder output selectable at 0-10 mV, 0-10 mV, 0-1 V, 4-20 mA or 0-20 mA



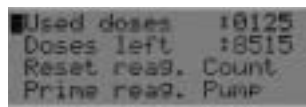
Adjustable setpoint, proportional dosing and high and low alarms



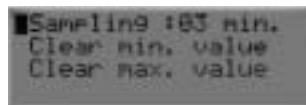
User-friendly interface simplifies setup and maintenance.



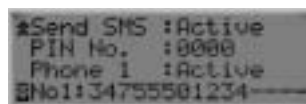
Analog output for proportional chlorine or acid/alkali dosing pump control



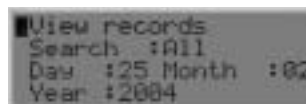
Minimum required maintenance, thanks to the pre-mixed reagents that can last for weeks



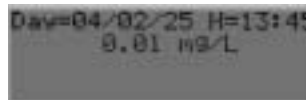
Sampling interval selectable from 3 to 90 minutes for chlorine and from 3 to 120 minutes for pH



SMS message sending through the external optional HI 504900 GSM module



Up to 3500 data series can be stored and then downloaded to a PC...



... or shown on the display

PCA 310 • PCA 320 • PCA 330 Chlorine, pH, ORP and Temperature Analyzers



PCA 310 • PCA 320 • PCA 330 Chlorine, pH, ORP and Temperature Analyzers

SPECIFICATIONS		PCA 310	PCA 320	PCA 330
Range	Free & Total Chlorine	0.00 to 5.00 mg/L	0.00 to 5.00 mg/L	0.00 to 5.00 mg/L
	pH	-	0.00 to 14.00 pH	0.00 to 14.00 pH
	Temperature	-	5.0 to 75.0°C/41 to 167°F	5.0 to 75.0°C/41 to 167°F
	ORP	-	-	0 to 2000 mV
Resolution	Free & Total Chlorine	0.01 mg/L	0.01 mg/L	0.01 mg/L
	pH	-	0.01 pH	0.01 pH
	Temperature	-	0.1 °C/0.1°F	0.1 °C/0.1°F
	ORP	-	-	1 mV
Accuracy	Free & Total Chlorine	±8% ±0.05 mg/L (whichever is greater)	±8% ±0.05 mg/L	±8% ± 0.05 mg/L
	pH	-	± 0.05 pH	± 0.05 pH
	Temperature	-	±0.5°C/±1°F	±0.5°C/±1°F
	ORP	-	-	±1 mV
Minimum Detectable Level	Free & Total Chlorine	0.05 mg/L		
Input Impedance		10 ¹² Ohm		
Calibration	Free & Total Chlorine	1 point		
	pH	1 or 2 point		
Sampling Rate	Free & Total Chlorine	adjustable from 3 to 90 minutes		
	pH	adjustable from 3 to 120 seconds		
Dosage	Free & Total Chlorine	proportional with 4-20 mA output		
	pH	ON/OFF with relay or proportional with 4-20 mA output		
Delta	Free & Total Chlorine	selectable from 0.1 to 5 mg/L		
	pH	selectable from 0.1 to 2 pH (hysteresis adjustable from 0.05 to 2 pH)		
Recorder Output		0-10 mV, 0-100 mV, 0-1 V, 4-20 mA or 0-20 mA		
Serial Communication		RS485 port, galvanically isolated		
Baud Rate		1200, 2400, 4800, 9600 bps		
Data Logging		up to 3500 data series		
GSM Communication		2 programmable cellular phone numbers, alarm & information SMS using the HI 504900 module (optional)		
Alarm Relay		SPDT contact with 5A, 230 V resistive load		
Dosing Relay		SPDT contact with 5A, 230 V resistive load		
System Error		SPDT contact with 5A, 230 V resistive load		
Inlet Pressure		0.07 to 4 bar with no external pressure regulator (for pressure exceeding 4 bar an external pressure regulator is required)		
Sample Flow		100 to 300 mL/min		
Sample Temperature		5 to 40°C (41 to 104°F)		
Sample Inlet Connection		12 mm (1/2") tubing diameter		
Drain Connection		10 mm (3/8") bar fitting		
Power Supply		115 VAC or 230 VAC; 50/60 Hz; 20 VA		
Enclosure		NEMA-4X standard, molded fiberglass polyester with transparent Lexan window		
Dimensions / Weight		318 x 267 x 159 mm (12.5 x 10.5 x 6.25") / 5 kg (11 lb.) without reagents		

ORDERING INFORMATION:

PCA 310-1 Free & Total Chlorine Analyzer, 115 VAC power supply.

PCA 310-2 Free & Total Chlorine Analyzer, 230 VAC power supply.

PCA 320-1 Free & Total Chlorine, pH and Temperature Analyzer, 115 VAC power supply.

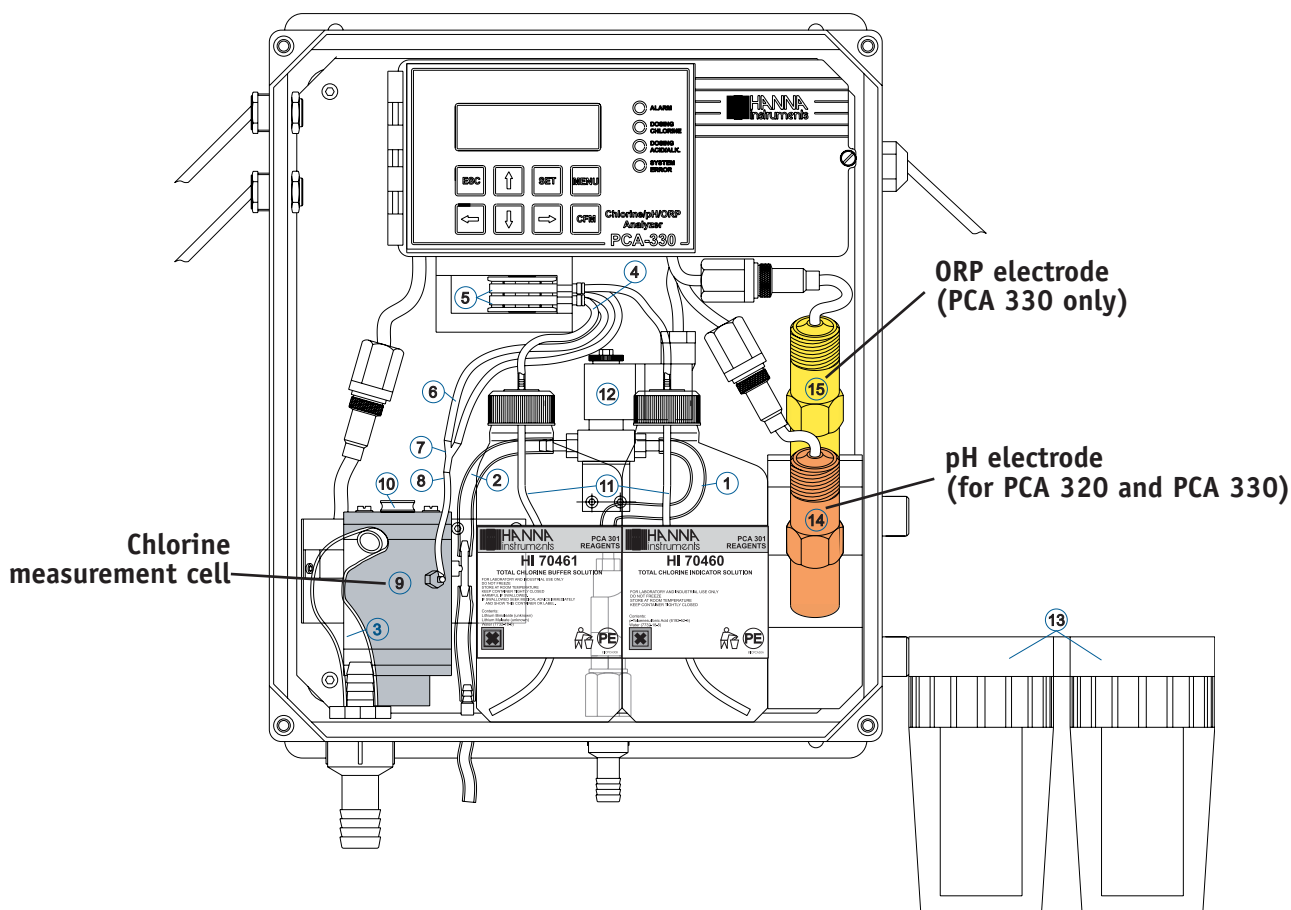
PCA 320-2 Free & Total Chlorine, pH and Temperature Analyzer, 230 VAC power supply.

PCA 330-1 Free & Total Chlorine, pH, ORP and Temperature Analyzer, 115 VAC power supply.

PCA 330-2 Free & Total Chlorine, pH, ORP and Temperature Analyzer, 230 VAC power supply.

Each PCA model is supplied complete with instructions.

PCA Series Spare Parts



PCA Series of Analyzers Parts and Accessories

HI 70473 PCA tubing kit, pressure regulator to drain (2 pcs). Each kit includes: transparent Tygon tubes 86L x 3.2ID mm (3.4 x 0.1") (Length x Internal Diameter) (1, 2) and 105 x 9.5 mm 4.1 x 0.4") (3)

HI 70474 PCA peristaltic pump tubing kit (6 pcs). Each kit includes: non-transparent C-flex tubes 55L x 0.8ID mm (2.1 x 0.03") (5)

HI 70475 PCA peristaltic pump tubing kit (2 pcs). Each kit includes: non-transparent C-flex tubes 55L x 0.8ID mm (2.1 x 0.03") (5)

HI 70476 PCA reagent bottle tubing kit (6 pcs). Each kit includes: non-transparent C-flex tubes 155L x 0.8ID mm (6.1 x 0.03") (11)

HI 70477 PCA tubing set for measuring cell (2 pcs). Each set includes: non-transparent C-flex tube 50L x 0.8ID mm (2.0 x 0.03") (8) and Y strainer (7)

HI 70478 PCA tubing kit, bottle to pump (6 pcs). Each kit includes: non-transparent C-flex tube 150L x 0.8ID mm (5.9 x 0.03") (4)

HI 70479 PCA tubing kit, pump to Y strainer (6 pcs). Each kit includes: non-transparent C-flex tube 150L x 0.8ID mm (5.9 x 0.03") (6)

HI 70480 PCA free chlorine reagent kit (for fresh water). The kit includes buffer solution, indicator and DPD powder.

HI 70481 PCA total chlorine reagent kit (for fresh water). The kit includes buffer solution, indicator and DPD powder reagent.

HI 70482 PCA filters. The kit includes 0.5 µm and 50 µm filters (13)

HI 70483 PCA complete tubing kit. The kit includes: non-transparent C-flex tubes (4, 6) 150L x 0.8ID (5.9 x 0.03") (4 pcs), non-transparent C-flex tubes (5) 55L x 0.8ID (2.1 x 0.03") (2 pcs), non-transparent C-flex tubes (8) 50L x 0.8ID (2.0 x 0.03") and Y strainer (7)

HI 70484 PCA complete tubing kit (3 pcs). Each kit includes: non-transparent C-flex tubes (4, 6) 150L x 0.8ID (5.9 x 0.03") (4 pcs), non-transparent C-flex tubes (5) 55L x 0.8ID (2.1 x 0.03") (2 pcs), non-transparent C-flex tubes (8) 50L x 0.8ID (2.0 x 0.03"), Y strainer (7)

HI 70485 PCA stirrer motor

HI 70486 PCA stirring bar (2 pcs)

HI 70487/N Measuring cell (9)

HI 70488 Electrovalve, 24VAC/60Hz (12)

HI 70489 Electrovalve, 24VAC/50Hz (12)

HI 70494 PCA calibration port cap (10)

HI 704731 Complete set of tubes from pressure regulator to drain (PCA 310)

HI 70492 Electrode holder (PCA 330)

HI 704732 Complete set of tubes from electrode holder to drain (PCA 320/PCA 330)

HI 70493 Closing cap for electrode holder

HI 1005 Amplified pH electrode with Matching Pin and Pt100 (14) (PCA 320/330 only)

HI 2008 Amplified ORP electrode with Matching Pin (15) (PCA 330 only)

HI 70490 Free Cl₂ reagent pack

HI 70491 Total Cl₂ reagent pack

HI 7004M pH 4.01 buffer solution, 230 mL

HI 7004L pH 4.01 buffer solution, 500 mL

HI 7006M pH 6.86 buffer solution, 230 mL

HI 7006L pH 6.86 buffer solution, 500 mL

HI 7007M pH 7.01 buffer solution, 230 mL

HI 7007L pH 7.01 buffer solution, 500 mL

HI 7009M pH 9.18 buffer solution, 230 mL

HI 7009L pH 9.18 buffer solution, 500 mL

HI 7010M pH 10.01 buffer solution, 230 mL

HI 7010L pH 10.01 buffer solution, 500 mL

HI 7020M 200-275 mV buffer solution, 230 mL

HI 7020L 200-275 mV buffer solution, 500 mL

HI 7091M Pretreatment reducing solution, 230 mL

HI 7091L Pretreatment reducing solution, 460mL

HI 7092M Pretreatment oxidizing solution, 230 mL

HI 7092L Pretreatment oxidizing solution, 460mL

HI 70300M Storage solution, 230 mL

HI 70300L Storage solution, 460 mL

HI 7082 3.5M KCL electrolyte, 4 x 50 mL

HI 7061M Electrode cleaning solution, 230 mL

HI 7061L Electrode cleaning solution, 460 mL

HI 504900 Hanna GSM module

HI 92500 Windows® compatible software

Chemical Oxygen Demand



Chemical Oxygen Demand

In the past untreated wastewater was allowed to runoff freely into surface waters. With increasing population and industrial activity in the world's cities, the water quality of the surrounding surface water steadily decreased. In these areas, the ecosystem was disturbed, bodies of water began to smell badly and aquatic flora and fauna languished and died. Eventually this became a huge environmental problem, and as a result, different waterborne human illnesses appeared more frequently in these areas.

Oxygen Demand and COD

Chemical Oxygen Demand (COD) is defined as the amount of specified oxidant that reacts with a sample under controlled conditions. The quantity of oxygen consumed is expressed in terms of its oxygen equivalent: mg/L of O₂.

The HANNA instruments® COD method is based on the well established 'closed dichromate-reflux colorimetric method', in concordance with the main official courses for chemical analysis in water and wastewater: "Standard Methods for the Examination of Water and Wastewater" (20th ed.) method #5220D and "US Environmental Protection Agency, Methods and Guidance for Analyses of Water" (2nd ed.) EPA method #410.4 and ISO 15705-2002. Moreover the US Environmental Protection Agency specifies that the dichromate reflux method is the only method acceptable for reporting purposes. The advantage in using this method includes certifiable results as well as high accuracy.

COD Testing Applications

COD is used as a measurement of pollutants. It is normally measured in both municipal and industrial wastewater treatment plants and gives an indication of the efficiency of the treatment process. COD is measured on both influent and effluent water. The efficiency of the treatment process is normally expressed as COD Removal, measured as a percentage of the organic matter purified during the cycle. COD has further applications in power plant operations, chemical manufacturing, commercial laundries, pulp & paper mills, agriculture & animal waste runoff, environmental studies and general education. HANNA instruments' equipment can be used in the laboratory or for on-site testing. The measurement procedure has been designed for ease of use by personnel at any skill level.

MONITORING EXAMPLES

Test Number	COD Influent	COD Effluent	COD Removal
1	1214	451	62%
2	948	328	63%
3	1341	307	77%

Beyond COD: Nitrogen and Phosphorus

The target in Waste Water Treatment is not only COD reduction, but also to control Nitrogen and Phosphorus, which are responsible for eutrophication phenomena in natural environments. Moreover, COD, Nitrogen, and Phosphorus control in plants are performed not only to respect the laws for environmental protection, but also to optimize plant costs.

Effective monitoring and control of parameters such as ammonia, nitrate, total nitrogen and total reactive phosphorus allows plant managers to profile and improve the health of an aquatic ecosystem. By accurately monitoring levels of each specific pollutant, operational parameters can be adjusted to maintain high efficiency of biodegradation treatments while also minimizing costs.

Nitrogen

When a treatment plant uses processes like nitrification and denitrification, it is important to monitor and maintain the equilibrium between Ammonia Nitrogen, Nitrate and Total Nitrogen during the bio-treatment. The nitrogen level is important because it needs to be related to the quantity of oxygen provided in the nitrification area. Ammonia is also controlled because it can become very toxic for the bacteria responsible for denitrification.

Phosphorus

Phosphorus is measured during both biological and chemical dephosphorization. An excessive amount of phosphate discharged in superficial waters or in bio-treatment tanks causes a great increase of algae and system eutrophication.

Certified Reagents for Chemical Oxygen Demand

Easy to use:

HANNA instruments® pre-dosed test tubes make COD measurement effortless. Even a novice can run COD tests in just 3 simple steps:



Fill the pre-dosed vial with the sample and replace the cap



Place the vial in the reactor and set the timer



Place the vial in the HANNA instruments® photometer and read the result on the LCD

Notes:

- * Method with chromium-sulfuric acid is officially recognized by EPA for wastewater analysis.
- ** The HI 93754F-25 and HI 93754G-25 method follows the official method ISO 15705.
- *** This method is recommended for general purpose analysis with no chloride interference.



HANNA instruments® certified reagents are available in the following formats:

Code	Method	Range
HI 93754A-25	EPA*	0 to 150 mg/L
HI 93754B-25	EPA*	0 to 1500 mg/L
HI 93754C-25		0 to 15000 mg/L
HI 93754D-25	Mercury-Free***	0 to 150 mg/L
HI 93754E-25	Mercury-Free***	0 to 1500 mg/L
HI 93754F-25	ISO**	0 to 150 mg/L
HI 93754G-25	ISO**	0 to 1000 mg/L

Each box of 25 vials is supplied with a HANNA instruments® certificate of quality. The reagents are traceable to NIST SRM® 930.

■ Three measurement ranges to satisfy each need

As COD levels vary depending on the application and process measuring points, HANNA instruments® offers reagents to cover three separate ranges. Simply choose the best range for your application:

- > **low range:** 0 to 150 mg/L O₂
- > **medium range:** 0 to 1500 mg/L or 0 to 1000 mg/L O₂
- > **high range:** 0 to 15000 mg/L O₂

■ Accurate and repeatable measurements

HANNA instruments® COD reagents have been developed in accordance with Standard Methods 5220D, USEPA 410.4 and ISO 15705:2002 methods.

■ Pre-dosed vials

HANNA instruments® vial contains approx. 3 mL of pre-dosed reagent. The operator just needs to add a small quantity of the sample - 2 mL for LR and MR, and 0.2 mL for HR analysis.

■ Quick and accurate measurements

With pre-dosed vials test preparation time is dramatically reduced. There is no time-consuming reagent preparation procedure or glassware cleaning.

■ Safe reagents

HANNA instruments® COD reagents are safe for operators and the environment. Vials and caps have been designed to avoid accidental reagent spills. Thanks to the pre-dosed reagents, the amount of chemicals is minimized.

HANNA instruments® also produces mercury-free reagents, to be used for analyzing samples without chloride.

HI 83099 COD Meter and 36 Additional Parameters



A Complete Laboratory

HI 83099 is one of the most versatile photometers on the market. In addition to COD, this meter measures up to 36 of the most important water quality parameters. The HI 83099 runs for hours on two common 9V batteries. In addition, it can operate continuously with input voltage of 12-20 VDC. HI 83099 is extremely simple to use. The front mask lists all the parameters in a numerical order and the display shows the same numbers for a quick reference during testing. The meter can be zeroed in seconds and the reagents cost much less than what you have been used to paying. All this and much more at a fraction of the cost of expensive and complex spectrophotometers!

This compact photometer operates in three different ranges to cover virtually every COD application: 0-150 mg/L, 0-1500 mg/L and 0-15000 mg/L. The HI 83099 meets the design requirements of USEPA 410.4, guaranteeing high quality measurements to be used for reporting purposes.

The HI 83099 can be operated manually or from the PC via a built-in RS232 port and data can be downloaded for analysis and documentation purposes with the HI 92000 application software.

■ Easy COD measurement

The HI 83099 multi-parameter photometer is pre-calibrated to measure COD levels at three ranges at the touch of a key pad. Simply use the scroll button to select the desired range and begin reading. The HI 83099 automatically selects the correct wavelength for the chosen range.

■ Outstanding measurement quality

The HI 83099 employs an advanced optical system, assuring high accuracy measurements in the entire measurement range. The optics combine the power of a miniature light source with the precision of a narrow band interference filter.

■ Save space in your laboratory

The compact size of the HI 83099 photometer allows the user to eliminate the clutter of bulkier and more costly spectrophotometers currently being used. Measuring 23 x 17 x 7 cm and weighing less than 700 grams, the HI 83099 can be easily transported from place to place.

SPECIFICATIONS

Light Source

3 tungsten lamps with narrow-band interference filters at 420/525/610 nm

Light Detector

4 silicon photocells

Power Supply

2 x 9V batteries or 12 VDC adapter

Auto-off

after 10 minutes of non-use

Environment

0 to 50°C (32 to 122°F); RH max 95%

Dimensions

230 x 165 x 70 mm (9.1 x 6.5 x 2.6")

Weight

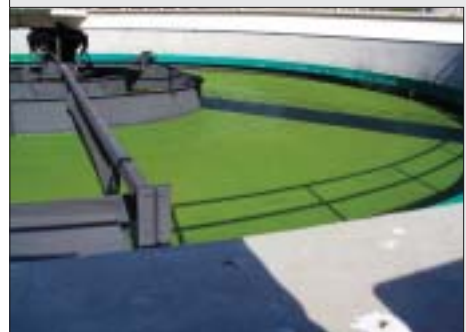
640 g (1.4 lb.)

ORDERING INFORMATION:

HI 83099 is supplied complete with 3 glass cuvettes, cell protective cap, batteries, 12 VDC adapter and instructions.

ACCESSORIES:

- HI 92000** Windows® compatible application software
- HI 920010** Serial cable for PC connection
- HI 3898** Test kit for Chloride interference



HI 83099 COD Meter and 36 Additional Parameters

Parameter	Range	Method	Reagent Code*****
Alluminum	0.00 to 1.00 mg/L	Aluminon	HI 93712-01
Ammonia LR	0.00 to 3.00 mg/L	Nessler	HI 93700-01
Ammonia MR	0.00 to 9.99 mg/L	Nessler	HI 93715-01
Bromine	0.00 to 8.00 mg/L	DPD	HI 93716-01
Chlorine, free****	0.00 to 2.50 mg/L	DPD	HI 93701-01
Chlorine, total****	0.00 to 3.50 mg/L	DPD	HI 93711-01
Chlorine dioxide	0.00 to 2.00 mg/L	Chlorophenol red	HI 93738-01
Chromium VI LR	0 to 300 µg/L	Diphenylcarbohydrazine	HI 93749-01
Chromium VI HR	0 to 1000 µg/L	Diphenylcarbohydrazine	HI 93723-01
COD LR	0 to 150 mg/L	Dichromate EPA*	HI 93754A-25
		Dichromate Hg-free***	HI 93754D-25
		Dichromate ISO**	HI 93754F-25
COD MR	0 to 1500 mg/L	Dichromate EPA*	HI 93754B-25
		Dichromate Hg-free***	HI 93754E-25
	0 to 1000 mg/L	Dichromate ISO**	HI 93754G-25
COD HR	0 to 15000 mg/L	Dichromate	HI 93754C-25
Color	0 to 500 PCU	Platinum Cobalt	—
Copper LR	0 to 990 µg/L	Bicinchoninate	HI 95747-01
Copper HR	0.00 to 5.00 mg/L	Bicinchoninate	HI 93702-01
Cyanide	0.000 to 0.200 mg/L	Pyridine-Pyrazalone	HI 93714-01
Cyanuric acid	0 to 80 mg/L	Turbidimetric	HI 93722-01
Fluoride	0.00 to 2.00 mg/L	SPADNS	HI 93729-01
Hardness (Calcium)	0.00 to 2.70 mg/L	Calmagite	HI 93720-01
Hardness (Magnesium)	0.00 to 2.00 mg/L	EDTA	HI 93719-01
Hydrazine	0 to 400 µg/L	p-Dimethylaminobenzaldehyde	HI 93704-01
Iodine	0.0 to 12.5 mg/L	DPD	HI 93718-01
Iron LR	0 to 400 µg/L	TPTZ	HI 93746-01
Iron HR	0.00 to 5.00 mg/L	Phenantroline	HI 93721-01
Manganese HR	0.0 to 20.0 mg/L	Periodate oxidation	HI 93709-01
Manganese LR	0 to 300 µg/L	PAN	HI 93748-01
Molybdenum	0.0 to 40.0 mg/L	Mercaptoacetic acid	HI 93730-01
Nickel HR	0.00 to 7.00 g/L	Photometric	HI 93726-01
Nitrate	0.0 to 30.0 mg/L	Cadmium reduction	HI 93728-01
Nitrite LR	0.00 to 0.35 mg/L	Diazotation	HI 93707-01
Nitrite HR	0 to 150 mg/L	Ferrous sulfate	HI 93708-01
Oxygen, dissolved	0.0 to 10.0 mg/L	Winkler	HI 93732-01
pH	6.5 to 8.5 pH	Phenol red	HI 93710-01
Phosphate LR	0.00 to 2.50 mg/L	Ascorbic acid	HI 93713-01
Phosphate HR	0.0 to 30.0 mg/L	Amino acid	HI 93717-01
Phosphorus	0.0 to 15.0 mg/L	Amino acid	HI 93706-01
Silica	0.00 to 2.00 mg/L	Dimolybdate	HI 93705-01
Silver	0.000 to 1.000 mg/L	PAN	HI 93737-01
Zinc	0.00 to 3.00 mg/L	Zincon	HI 93731-01

Notes:

* Method with chromium-sulfuric acid is officially recognized by EPA for wastewater analysis.

** The HI 93754F-25 and HI 93754G-25 method follows the official method ISO 15705.

*** This method is recommended for general purpose analysis with no chloride interference.

***** For chlorine analysis, liquid reagents are also available.

HI 83214 Complete System for Waste Water Analysis



The new HI 83214 multi-parameter photometer is a compact instrument featuring different ranges and methods, suitable for a wide range of applications. HI 83214 is designed and built to perform COD analysis in accordance with EPA 410.4 and ISO 15705:2002 standards.

Ensuring accurate and repeatable results, it is the ideal tool for documenting water treatment processes. Besides the fundamental parameter of COD, HI 83214 also measures total ammonia nitrogen and total reagent phosphorus. The instrument can be connected to a PC through an RS232 serial port and all stored measurements can be downloaded to a PC using HANNA instruments® HI 92000 software. HI 83214 allows a complete wastewater analysis with a single powerful instrument.

Parameter	Range	Method	Reagent Code
Ammonia, LR	0.00 to 3.00 mg/L	Nessler	HI 93764A-25
Ammonia, HR	0 to 100 mg/L	Nessler	HI 93764B-25
Chlorine, free	0.00 to 5.00 mg/L	DPD	HI 93701-01, HI 93701-03
Chlorine, total	0.00 to 5.00 mg/L	DPD	HI 93711-01, HI 93711-03
Nitrate	0.0 to 30.0 mg/L	Chromotropic acid	HI 93766-50
Nitrogen, total	0.0 to 25.0 mg/L	Chromotropic acid	HI 93767A-50
Nitrogen, total HR	10 to 150 mg/L	Chromotropic acid	HI 93767B-50
COD LR, EPA*	0 to 150 mg/L	Dichromate	HI 93754A-25
COD MR, EPA*	0 to 1500 mg/L	Dichromate	HI 93754B-25
COD HR	0 to 15000 mg/L	Dichromate	HI 93754C-25
COD LR, Mercury-free***	0 to 150 mg/L	Dichromate, mercury-free	HI 93754D-25
COD MR, Mercury-free***	0 to 1500 mg/L	Dichromate, mercury-free	HI 93754E-25
COD LR, ISO**	0 to 150 mg/L	Dichromate	HI 93754F-25
COD MR, ISO**	0 to 1000 mg/L	Dichromate	HI 93754G-25
Phosphorus, reactive	0.00 to 5.00 mg/L	Ascorbic acid	HI 93758A-50
Phosphorus, acid hydrolyzable	0.00 to 5.00 mg/L	Ascorbic acid	HI 93758B-50
Phosphorus, total	0.00 to 3.50 mg/L	Ascorbic acid	HI 93758C-50
Phosphorus, reactive HR	0.0 to 100.0 mg/L	Vanadomolybdophosphoric acid	HI 93763A-50
Phosphorus, total HR	0.0 to 100.0 mg/L	Vanadomolybdophosphoric acid	HI 93763B-50

ORDERING INFORMATION:

HI 83214 is supplied complete with 5 glass cuvetts, batteries, 12 VDC adapter and instructions.

ACCESSORIES:

- HI 92000** Windows® compatible application software
HI 920010 Serial cable for PC connection
HI 3898 Test kit for Chloride interference

SPECIFICATIONS

Light Source

3 tungsten lamps with narrow-band interference filters at 420/525/610 nm

Light Detector

3 silicon photocells

Power Supply

2 x 9V batteries or 12 VDC adapter

Auto-off

after 10 minutes of non-use

Environment

0 to 50°C (32 to 122°F); RH max 95%

Dimensions

230 x 165 x 70 mm (9.1 x 6.5 x 2.6")

Weight

640 g (1.4 lb.)

Notes:

* Method with chromium-sulfuric acid is officially recognized by EPA for wastewater analysis.

** The HI 93754F-25 and HI 93754G-25 method follows the official method ISO 15705.

*** This method is recommended for general purpose analysis with no chloride interference.

HI 839800 Test Tube Heater • Reagents and Accessories**SPECIFICATIONS****Temperature of Reaction**

selectable, 105°C or 150°C

Temperature Stability

±0.5°C

Capacity25 vials (dia 16 x 100 mm, 0.6 x 3.9"),
1 receptacle for a reference thermometer
with stainless steel probe**Accuracy**

±2°C (@25°C/77°F)

Warm-up Timeapprox. 30 minutes, depending on
selected temperature**Operating Mode**

timed (0 to 120 minutes) or infinity mode

Timer0 to 120 minutes with acoustic alarm and auto-
matic shut-off**Block**

aluminum

Environment

5 to 50°C (41 to 122°F)

Power Supply (fuse protected)100 VAC, 50/60Hz; 230 VAC; 50 Hz; 250W; 2A
fuse**Dimensions**

190 x 300 x 95 mm (7.5 x 11.8 x 3.7")

Weight

4.8 Kg (10.6 lb.)

HI 839800

HANNA instruments® HI 839800 thermo-reactor is constructed of durable materials with a vial capacity to perform up to 25 digestions simultaneously. The reactor is equipped with a user selectable temperature setting to allow for COD and total phosphorus reactions at 150°C and also 105°C for total nitrogen analysis. To ensure the highest accuracy of digestion, a timer up to 120 minutes is incorporated. An audible alarm indicates when the incubating period is completed.

The HI 839800 is also equipped with an ON/OFF LED and a heating LED which advises the user when the selected temperature has been reached. For added safety, an auto-off feature is incorporated and an internal temperature sensor prevents over-heating of the samples.

ORDERING INFORMATION:

HI 839800-01 (115 VAC) is supplied complete with instructions.

HI 839800-02 (230 VAC) is supplied complete with instructions.

ACCESSORIES:

- HI 740216** Test tube cooling rack (25 tube capacity)
HI 740217 Laboratory bench safety shield
HI 151-00 Electronic thermometer for reactor (°C)
HI 151-01 Electronic thermometer for reactor (°F)

COD REAGENTS AND ACCESSORIES

- | | |
|---------------------------------------------------------|-------------------------------------------------------------|
| HI 839800-01 Reactor (115 VAC) | HI 731342 2000 µL automatic pipette |
| HI 839800-02 Reactor (230 VAC) | HI 731350 Tip for 200 µL automatic pipette (25 pcs) |
| HI 151-00 Thermometer with stainless steel probe | HI 731351 Tip for 1000 µL automatic pipette (25 pcs) |
| HI 710005 110 VAC / 12 VDC power adapter | HI 731352 Tip for 2000 µL automatic pipette (4 pcs) |
| HI 710006 220 VAC / 12 VDC power adapter | HI 740216 Test tube cooling rack (25 tube capacity) |
| HI 731310 9V battery (10 pcs) | HI 740217 Laboratory bench safety shield |
| HI 731311 Cuvets with caps for HI 83214 | HI 740219 COD test tube adapter for HI 83099 |
| HI 731318 Tissue for wiping cuvetts (4 pcs) | HI 92000 Windows® compatible application software |
| HI 731321 Measurement cuvet (4 pcs) | HI 920010 Serial cable for PC connection (9 pin) |
| HI 731325N Cuvet cap (4 pcs) | HI 93703-50 Cuvet cleaning solution (230 mL) |
| HI 731340 200 µL automatic pipette | |
| HI 731341 1000 µL automatic pipette | |

HI 9026 Calibration Check™ pH/ORP/Temperature Meter

HI 9026 is an advanced pH/ORP meter specifically designed to provide affordable and very precise results under harsh industrial conditions. The meter also features a backlit display for clear readings in the darkest environments. You can choose from 7 memorized buffer values for pH calibration, from very acidic (pH 1.68) to extremely alkaline (pH 12.45). In addition, the user can program 2 custom buffer values, in order to best fit the characteristics of the sample. When calibration is complete, the electrode condition is displayed, so the user can be sure the electrode is working properly or that it needs to be cleaned or replaced. The user can also set up a calibration time-out from 1 to 14 days to be notified when it is time to recalibrate the meter.

HI 9026 is housed in a waterproof casing and can also be used with ORP electrodes. It comes complete with HI 1230B pH electrode and HI 7662 temperature probe to provide automatically compensated measurements.

ORDERING INFORMATION:

HI 9026 is supplied complete with HI 1230B pH electrode, HI 7662 temperature probe, pH 4 and pH 7 buffer sachets, 100 mL plastic beaker, batteries, rugged carrying case and instructions.

ACCESSORIES:

HI 1230B	pH electrode, gel filled, Ultem® body, BNC connector, 1 m cable
HI 3230B	ORP electrode, gel filled, Ultem® body, BNC connector, 1 m cable
HI 7662	Temperature probe
HI 76405	Electrode holder
HI 7001L	pH 1.68 buffer solution, 500 mL bottle
HI 7004L	pH 4.01 buffer solution, 500 mL bottle
HI 7006L	pH 6.86 buffer solution, 500 mL bottle
HI 7007L	pH 7.01 buffer solution, 500 mL bottle
HI 7009L	pH 9.18 buffer solution, 500 mL bottle
HI 7010L	pH 10.01 buffer solution, 500 mL bottle
HI 70300L	Electrode storage solution, 500 mL bottle

SPECIFICATIONS**Range**

-2.00 to 16.00 pH; ± 699.9 mV; ± 1999 mV;
-20.0 to 120.0°C/-4.0°F to 248.0°F

Resolution

0.01 pH; 0.1 mV; 1 mV;
0.1°C/0.1 °F

Accuracy (@20°C/68°F)

± 0.01 pH; ± 0.2 mV; ± 1 mV;
 ± 0.4 °C/ ± 0.8 °F

Calibration Check

check of the electrode status during calibration

pH Calibration

automatic, 1 or 2 point with 7 memorized buffer values (pH 1.68, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45) + 2 custom buffers

Temperature Compensation

automatic or manual, -20 to 120°C (-4 to 248°F)

pH Electrode

HI 1230B, double junction, Ultem® body, gel filled, BNC connector and 1 m cable (included)

Temperature Probe

HI 7662 with 1 m (3.3') cable (included)

Input Impedance

10^{12} Ohm

Battery Type / Life

4 x 1.5V AA / approx. 500 hours of continuous use (with backlight off); auto-off after 20 minutes of non-use (can be disabled)

Environment

0 to 50°C (32 to 122°F); RH max 100%

Dimensions

196 x 80 x 60 mm (7.7 x 3.1 x 2.4")

Weight

500 g (1.1 lb.)

HI 9024 • HI 9025 pH/Temperature Meters

SPECIFICATIONS

Range

HI 9024: 0.00 to 14.00 pH;
0.0 to 100.0°C/32.0°F to 212.0°F
HI 9025: 0.00 to 14.00 pH; ±399.9 mV;
±1999 mV; 0.0 to 100.0°C/32.0°F to 212.0°F

Resolution

HI 9024: 0.01 pH; 0.1°C/0.1°F
HI 9025: 0.01 pH; 0.1 mV; 1 mV; 0.1°C/0.1°F

Accuracy (@20°C/68°F)

HI 9024: ±0.01 pH; ±0.4°C / ±0.8°F
HI 9025: ±0.01 pH; ±0.2 mV; ±1 mV
±0.4°C / ±0.8°F

pH Calibration

automatic, 1 or 2 point with 5 memorized buffer values (pH 4.01, 6.86, 7.01, 9.18, 10.01); offset calibration: ±1 pH; slope calibration: 70 to 108%

Temperature Compensation

automatic or manual, -5 to 105°C
(23°F to 221°F)

pH Electrode

HI 1230B, double junction, Ultem® body, gel filled, BNC connector and 1 m cable (included)

Temperature Probe

HI 7669/2W with 1 m (3.3') cable (included)

Input Impedance

10¹² Ohm

Battery Type / Life

4 x 1.5V AA / approx. 500 hours of continuous use; auto-off after 20 minutes of non-use (can be disabled)

Environment

0 to 50°C (32 to 122°F); RH max 100%

Dimensions

196 x 80 x 60 mm (7.7 x 3.1 x 2.4")

Weight

500 g (1.1 lb.)



HI 9024 and HI 9025 are microprocessor-based pH meters in waterproof casings. HI 9024 measures pH and temperature, and HI 9025 can also measure ORP in the mV range. Both meters are housed in rugged, waterproof, ABS casings that are built to last.

The Auto-Instruction feature guides the user step-by-step through the calibration process with graphic symbols. The automatic calibration procedure is simple and quick and can be performed at 1 or 2 points selected from 5 memorized buffers: pH 4.01, 6.86, 7.01, 9.18, 10.01. A stability indicator assures a correct calibration. Both meters also feature automatic shut-off to save battery life.

ORDERING INFORMATION:

HI 9024 is supplied complete with HI 1230B pH electrode, HI 7669/2W temperature probe, pH 4 and pH 7 buffer sachets, 100 mL plastic beaker, batteries, rugged carrying case and instructions.

HI 9025 is supplied complete with HI 1230B pH electrode, HI 7669/2W temperature probe, pH 4 and pH 7 buffer sachets, 100 mL plastic beaker, batteries, rugged carrying case and instructions.

ACCESSORIES:

- HI 1230B** pH electrode, gel filled, Ultem® body, BNC, 1 m cable
- HI 3230B** ORP electrode, gel filled, Ultem® body, BNC, 1 m cable
- HI 7669/2W** Temperature probe
- HI 76405** Electrode holder
- HI 7004L** pH 4.01 buffer solution, 500 mL bottle
- HI 7006L** pH 6.86 buffer solution, 500 mL bottle
- HI 7007L** pH 7.01 buffer solution, 500 mL bottle
- HI 7009L** pH 9.18 buffer solution, 500 mL bottle
- HI 7010L** pH 10.01 buffer solution, 500 mL bottle
- HI 70300L** Electrode storage solution, 500 mL bottle
- HI 8427** pH/mV electrode simulator
- HI 931001** pH/mV electrode simulator with display

HI 99141 Waterproof pH Meter for Boilers and Cooling Towers



SPECIFICATIONS

Range

-2.00 to 16.00 pH;
-5.0 to 105.0°C/23.0 to 221.0°F

Resolution

0.01 pH; 0.1°C/0.1°F

Accuracy (@20°C/68°F)

±0.02 pH; ±0.5°C (up to 60°C), ±1°C (outside)/
±1.0°F (up to 140°F), ±2°F (outside)

pH Calibration

automatic, 1 or 2 point with 2 sets
of memorized buffers (pH 4.01/7.01/10.01
or 4.01/6.86/9.18)

Temperature Compensation

automatic, -5 to 105°C (23 to 221°F)

pH Electrode

HI 72911, amplified, with titanium cage and
internal temperature sensor (included)

Battery Type / Life

3 x 1.5V AA / approx. 1500 hours of continuous
use; auto-off after 8 minutes of non-use

Environment

0 to 50°C (32 to 122°F); RH max 100%

Dimensions

150 x 80 x 36 mm (5.9 x 3.1 x 1.4")

Weight

210 g (7.4 oz.)

HI 99141 is a waterproof, portable pH/temperature meter, specifically designed for boiler & cooling tower applications. HI 72911 double-junction pH electrode (included) has an unbreakable titanium body and a flat tip. The electrode also features an annular Teflon® junction for maximum surface contact, giving increased response and stability. The titanium cage of the probe functions as a shield and adds to the sensor's life. The flat tip is easy to clean and prevents solids in solution from collecting on the sensor. This advanced electrode also contains an integral temperature sensor and a mini amplifier to boost the electrode signal, eliminating the effects of noise and interference.

The meter reads from -2 to 16 pH, while simultaneously showing the temperature in °C or °F. Graphic icons guide operations and an instability indicator with hold feature determines when to freeze the reading for easy record keeping. Calibration is performed automatically at one or two points with standard or NIST calibration buffers. Battery life is over 1500 hours and at startup, the LCD shows the remaining battery power. In addition, BEPS (Battery Error Prevention System) prevents bad readings due to low voltage and an auto-off period of 8 minutes saves battery power.

ORDERING INFORMATION:

HI 99141 is supplied complete with HI 72911 pH electrode with internal temperature sensor, pH 4 and pH 7 buffer sachets, HI 700661 electrode cleaning solution (2 x 20 mL), batteries, rugged carrying case and instructions.

ACCESSORIES:

HI 72911	pH electrode, double junction, with titanium cage	HI 70010P	pH 10.01 buffer solution, 20 mL sachet, 25 pcs.
HI 7004L	pH 4.01 buffer solution, 500 mL bottle	HI 70300L	Electrode storage solution, 500 mL bottle
HI 7007L	pH 7.01 buffer solution, 500 mL bottle	HI 700661	Electrode cleaning solution, 20 mL sachet, 25 pcs.
HI 7010L	pH 10.01 buffer solution, 500 mL bottle	HI 710007	Shockproof rubber boot, blue
HI 70004P	pH 4.01 buffer solution, 20 mL sachet, 25 pcs.	HI 710008	Shockproof rubber boot, orange
HI 70007P	pH 7.01 buffer solution, 20 mL sachet, 25 pcs.		



HI 99131 pH Meter for Plating Baths

SPECIFICATIONS

Range

-2.00 to 16.00 pH; -5.0 to 105.0°C/
23.0 to 221.0°F

Resolution

0.01 pH; 0.1°C/0.1°F

Accuracy (@20°C/68°F)

±0.02 pH; ±0.5°C (up to 60°C), ±1°C (outside)/
±1.0°F (up to 140°F), ±2°F (outside)

pH Calibration

automatic, 1 or 2 point with 2 sets of memorized
buffers (pH 4.01/7.01/10.01 or 4.01/6.86/9.18)

Temperature Compensation

automatic, -5 to 105°C (23 to 221°F)

pH Electrode

HI 62911, amplified, with titanium cage, internal
temperature sensor and Matching-Pin (included)

Battery Type / Life

3 x 1.5V AA / approx. 1500 hours of continuous
use; auto-off after 8 minutes of non-use

Environment

0 to 50°C (32 to 122°F); RH max 100%

Dimensions

150 x 80 x 36 mm (5.9 x 3.1 x 1.4")

Weight

210 g (7.4 oz.)



HI 99131 is a waterproof, portable pH/temperature meter, ideal for use in plating baths. HI 62911 double junction pH electrode (included) has a titanium body and utilizes proven recessed flat tip technology. The body of the probe also functions as a potential matching pin to assure stable readings and an extended sensor life. The probe tip incorporates an annular Teflon® junction for maximum surface contact, giving increased response and stability, as well as an integral temperature sensor, eliminating the need for an additional temperature probe. The recessed flat tip is easy to clean and prevents solids in solution from collecting on the sensor. This advanced electrode also contains a mini amplifier to boost the electrode signal, rendering the meter impervious to noise and interference.

The meter reads from -2.00 to 16.00 pH, while simultaneously showing the temperature in °C or °F. Graphic icons guide operations and a stability indicator with hold feature determines when to freeze the reading for easy record keeping. Calibration is performed automatically at one or two points with standard or NIST calibration buffers. Battery life is over 1500 hours and, at startup, the LCD shows the remaining battery power. In addition, BEPS (Battery Error Prevention System) prevents inaccurate readings due to low voltage and an 8 minute auto-off period saves battery life.

ORDERING INFORMATION:

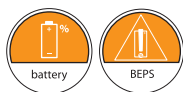
HI 99131 is supplied complete with HI 62911 pH electrode with internal temperature sensor, pH 4 and pH 7 buffer sachets, HI 700661 electrode cleaning solution (2 x 20 mL), batteries, rugged carrying case and instructions.

ACCESSORIES:

HI 62911	pH electrode, double junction, with titanium cage	HI 70010P	pH 10.01 buffer solution, 20 mL sachet, 25 pcs.
HI 7004L	pH 4.01 buffer solution, 500 mL bottle	HI 70300L	Electrode storage solution, 500 mL bottle
HI 7007L	pH 7.01 buffer solution, 500 mL bottle	HI 700661	Electrode cleaning solution, 20 mL sachet, 25 pcs.
HI 7010L	pH 10.01 buffer solution, 500 mL bottle	HI 710007	Shockproof rubber boot, blue
HI 70004P	pH 4.01 buffer solution, 20 mL sachet, 25 pcs.	HI 710008	Shockproof rubber boot, orange
HI 70007P	pH 7.01 buffer solution, 20 mL sachet, 25 pcs.		



HI 9835 Waterproof EC/TDS/°C/NaCl Meter



HI 9835 combines four important parameters you need for measuring conductivity. Now you can sample Electro-Conductivity (EC), Total Dissolved Solids (TDS), sodium chloride (NaCl) and temperature simultaneously. HANNA instruments®'s probe design innovation uses 4 rings enhanced with platinum for greater stability while increasing the range of measurable concentrations and temperature.

You can choose between automatic and manual temperature compensation to match your operating requirements. In addition, you can also select from a range of TDS factors from 0.40 to 0.80 and a range of temperature coefficients 0.00 to 6.00% for greater consistency and reproducibility. The housing is completely waterproof and built to survive the harsh conditions of field use. For extended time studies, this meter can be connected to a 12 VDC power supply (optional).

ORDERING INFORMATION:

HI 9835 is supplied complete with HI 76309 probe with stainless steel sensor and 1 m (3.3') cable, batteries, rugged carrying case and instructions.

ACCESSORIES:

HI 76309	4-ring stainless steel sensor conductivity probe	HI 7034L	80000 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle
HI 76310	4-ring Pt sensor conductivity probe	HI 7035L	111800 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle
HI 7030L	12880 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle	HI 7037L	100% NaCl standard solution, 500 mL bottle
HI 7031L	1413 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle	HI 710005	115 VAC/12 VDC power adapter
HI 7033L	84 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle	HI 710006	230 VAC/12 VDC power adapter
HI 7039L	5000 $\mu\text{S}/\text{cm}$ calibration solution, 500 mL bottle	HI 721317	Rugged carrying case

SPECIFICATIONS

Range

EC: 0.00 to 29.99 $\mu\text{S}/\text{cm}$; 30.0 to 299.9 $\mu\text{S}/\text{cm}$; 300 to 2999 $\mu\text{S}/\text{cm}$; 3.00 to 29.99 mS/cm ; 30.0 to 200.0 mS/cm ; up to 500.0 mS/cm (actual EC)*
TDS: 0.00 to 14.99 ppm (mg/L); 15.0 to 149.9 ppm (mg/L); 150 to 1499 ppm (mg/L); 1.50 to 14.99 g/L; 15.0 to 100.0 g/L; up to 400.0 g/L (actual TDS)*

NaCl: 0.0 to 400.0%

Temperature: 0.0 to 60.0°C

Resolution

EC: 0.01 $\mu\text{S}/\text{cm}$; 0.1 $\mu\text{S}/\text{cm}$; 1 $\mu\text{S}/\text{cm}$; 0.01 mS/cm ; 0.1 mS/cm

TDS: 0.01 ppm (mg/L); 0.1 ppm (mg/L); 1 ppm (mg/L); 0.01 g/L; 0.1 g/L

NaCl: 0.1%

Temperature: 0.1°C

Accuracy

EC: $\pm 1\% \pm (0.05 \mu\text{S}/\text{cm} \text{ or } 1 \text{ digit})$

TDS: $\pm 1\% \pm (0.03 \text{ ppm or } 1 \text{ digit})$

NaCl: $\pm 1\%$

Temperature: $\pm 0.4^\circ\text{C}$

Calibration (EC)

automatic, 1 point, with 6 memorized values (84, 1413, 5000, 12880, 80000 and 111800 $\mu\text{S}/\text{cm}$)

Calibration (NaCl)

1 point, with HI 7037 calibration solution (not included)

Calibration (Temperature)

2-point, at 0 and 50°C (32 and 122°F)

Temperature Compensation

automatic or manual, 0 to 60°C (32 to 140°F); can be disabled for measuring actual EC and TDS

Temperature Coefficient

adjustable from 0.00 to 6.00%/°C (EC and TDS only)

TDS Conversion Factor

adjustable from 0.40 to 0.80

Probe

HI 76309, 4-ring probe, K=1 nominal, built-in temperature sensor (included)

Power Supply

4 x 1.5V AA batteries (included) or 12 VDC input; auto-off after 5 minutes of non-use (can be disabled)

Environment

0 to 50°C (32 to 122°F); RH max 100%

Dimensions

196 x 80 x 60 mm (7.7 x 3.1 x 2.4")

Weight

500 g (1.1 lb.)

* With temperature compensating disabled.

HI 9143 • HI 9145 Extended Range Dissolved Oxygen Meters



SPECIFICATIONS

Range

O_2 : 0.00 to 45.00 mg/L
% Saturation O_2 : 0.0 to 300.0%
Temperature: 0.0 to 50.0°C

Resolution

O_2 : 0.01 mg/L
% Saturation O_2 : 0.1%
Temperature: 0.1°C

Accuracy (@ 20°C/68°F)

O_2 : ±1.5% F.S.
% Saturation O_2 : ±1.5% F.S.
Temperature: ±0.5°C

Calibration

automatic, in air, at 100%

Temperature Compensation

automatic, 0 to 50°C (32 to 122°F)

Altitude Compensation (HI 9143 only)

0 to 1900 m; 100 m (328') resolution

Salinity Compensation (HI 9143 only)

0 to 40 g/L; 1 g/L resolution

Probe

HI 76407/4 polarographic, with 4 m (13') cable (included)

Power Supply

4 x 1.5V AA batteries / approx. 200 hours of continuous use; auto-off after 4 hours of non-use; or input for 12 VDC power adapter

Environment

0 to 50°C (32 to 122°F); RH max 100%

Dimensions

196 x 80 x 60 mm (7.7 x 3.1 x 2.4")

Weight

500 g (1.1 lb.)



Measurements in the field can subject instrumentation to the inclemency of weather. Cold, rain, snow, dust and humidity, associated with use in the field, can cause condensation which may damage a meter, rapidly deteriorating its performance and life. HI 9143 and HI 9145 are designed for harsh outdoor applications, especially waste water treatment and fish farming.

Simple on-site calibration requires no chemical solutions. Just expose the probe to air and press the CAL button. In a few minutes, the meter is calibrated and ready to use. Auto-calibration eliminates the need to use a screwdriver or other devices to adjust the reading.

The new and improved HI 9143 and HI 9145 measure and display O_2 from 0 to 300%, 0 to 45 mg/L and temperature from 0 to 50 °C. In addition to the features of HI 9145, HI 9143 also supplies the user with compensation of salinity and altitude factors. Both meters compensate for the temperature effect.

ORDERING INFORMATION:

HI 9143 is supplied complete with D.O. probe HI 76407/4 with 4 m (13') cable, 2 spare membranes, electrolyte solution HI 7041S (30 mL), batteries, rugged carrying case and instructions.

HI 9145 is supplied complete with D.O. probe, HI 76407/4 with 4 m (13') cable, 2 spare membranes, electrolyte solution HI 7041S (30 mL), batteries, rugged carrying case and instructions.

ACCESSORIES:

HI 76407/4	D.O. Probe with 4 m (13') cable	HI 710006	230 VAC/12 VDC adapter
HI 76407/10	D.O. Probe with 10 m (33') cable	HI 76407A/P	Replacement membrane (5 pcs)
HI 76407/20	D.O. Probe with 20 m (67') cable	HI 721317	Rugged carrying case
HI 7041S	Refilling electrolyte solution (30 mL)		

Chlorine Photometers with Exclusive Cal Check™ Feature



HI 95711C kit and
CAL CHECK™ cuvet shown

- Accuracy Verification
- User Calibration
- Certified Calibration and Verification Standards
- EPA Compliant
- 6 Custom Ranges To Fit All Applications
- Supplied as a Complete Kit
- Long Battery Life

Cal Check™

HI 957xx photometers can be easily verified and calibrated at any time thanks to the certified Cal Check™ standard solutions. Our standard solution sets for calibration are supplied with a NIST certificate of traceability, which increases user confidence in the accuracy of their instrument.

The new HI 957xx series features a light beam that is filtered by a narrow spectral bandwidth to offer the highest level of accuracy.

Field Ready Measurement Kit

As opposed to the traditional packaging of photometers, these new photometers are offered in a practical rugged carrying case designed to safely carry the necessary accessories for analysis, like cuvettes, scissors, tissue and the Cal Check™ standards.

All HI 957xx photometers are provided with:

1. protected measuring cell: the plastic cover avoids the accidental ingress of water inside the instrument.
2. Larger cuvettes for analysis: this also means easier sample preparations. Two innovations for simpler and better measurements in the field.

Easy-to-Use



- 1) Zero the instrument with standard A and then insert standard B



- 2) Press the Cal Check® button to validate the reading



- 3) Compare the reading with the certificate

Chlorine Photometers with Exclusive Cal Check™ Feature

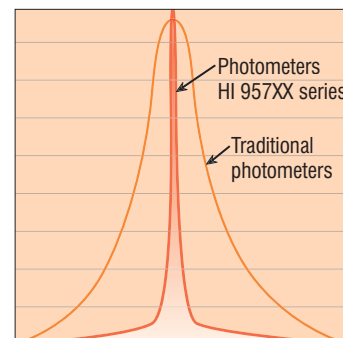


Peace of mind.

When performing measurements you need to know that the instrument you are using is right on. With Hanna's exclusive CAL CHECK™ feature you can now rest assured. Simply insert the factory calibrated standard of a known concentration and verify that your instrument is accurate.

High Precision

The most common colorimetric methods for water analysis, like chemical test kits, permit rapid but inaccurate measurements. Moreover, their validity can't be verified as they cannot be tested against certified compared parameters. The HI 957xx photometer series ensures high precision thanks to their innovative optical system and the ability to perform a quick validation and calibration with certified standard solutions. The advanced technology used in these meters, gives you an advantage when performing easy, quick and secure measurements.



Advanced Optical System

The new optical system of HI 957xx series, is composed of a tungsten lamp and a narrow-band interference filter to guarantee both high performance and reliable results. The larger diameter cuvet increases the optical path of the light and permits higher observation of absorbent values, therefore providing higher sensitivity at low concentrations.



Calibration Date on Display

The HI 957XX series of chlorine photometers displays the last time calibration was performed so you may schedule routine calibrations - ideal for ISO and Good Laboratory Practice environments.

READ/TIMER function counts down to appropriate time interval before a reading is displayed. This feature ensures consistency in measurements across multiple users.

Specifications for Photometers with Cal Check™

Description	Code	Range	Resolution	Method
Ammonia MR	HI 95715	0.00 to 9.99 mg/L	0.01 mg/L	Nessler
Chlorine, Free	HI 95701	0.00 to 5.00 mg/L	0.01 mg/L to 3.50 mg/L, 0.10 mg/L above	DPD
	HI 95762	0.000 to 0.500 mg/L	0.001 mg/L	DPD
Chlorine, Free and Total	HI 95734	0.00 to 10.00 mg/L	0.01 mg/L to 3.50 mg/L, 0.10 mg/L above	DPD
	HI 95711	0.00 to 5.00 (free)	0.01 mg/L to 3.50 mg/L, 0.10 mg/L above	DPD
		0.00 to 5.00 (total)	0.01 mg/L to 3.50 mg/L, 0.10 mg/L above	DPD
	HI 96711	0.00 to 5.00 (free)	0.01 mg/L to 3.50 mg/L, 0.10 mg/L above	DPD
		0.00 to 5.00 (total)	0.01 mg/L to 3.50 mg/L, 0.10 mg/L above	DPD
	HI 95724	0.00 to 5.00 (free)	0.01 mg/L to 3.50 mg/L, 0.10 mg/L above	DPD
		0.00 to 5.00 (total)	0.01 mg/L to 3.50 mg/L, 0.10 mg/L above	DPD
Chlorine, Total	HI 95761	0.000 to 0.500 mg/L	0.001 mg/L	DPD
Chlorine UHR	HI 95771	0 to 500 mg/L	1 mg/L (10 mg/L above 200 mg/L)	DPD
Copper LR	HI 95747	0.000 to 1.500 mg/L	0.001 mg/L	Bicinchoninate
Detergents, Anionic	HI 95769	0.00 to 3.50 mg/L	0.01 mg/L	MBAS
Fluoride LR	HI 95729	0.00 to 2.00 mg/L	0.01 mg/L	SPADNS
Iron HR	HI 95721	0.00 to 5.00 mg/L	0.01 mg/L	Phenantroline
Nitrite LR	HI 95707	0.000 to 0.600 mg/L	0.001 mg/L	Diazotization
Phosphate HR	HI 95717	0.0 to 30.0 mg/L	0.1 mg/L	Amino Acid
Phosphorus	HI 95706	0.0 to 15.0 mg/L	0.1 mg/L	Amino Acid

Chlorine Photometers with Exclusive Cal Check™ Feature



HANNA Kits for Chlorine Analysis Recommendations:

- Wastewater plants (HI 95711)
- Drinking water plants (HI 95762)
- Municipal waterworks (HI 95701 and HI 95711)
- Industrial processes (HI 95701 and HI 95734)
- Boilers (HI 95701)
- Cooling towers (HI 95701)
- Food industry (HI 95734)
- Swimming pools (HI 95711)
- Osmosis, pharmaceutical manufacturers (HI 95761)



Free & Total

Free & Total Chlorine

HI 95711

The HI 95711 measures both free & total chlorine content in water samples in the 0.00 to 5.00 mg/L (ppm) range.



Free & Total HR

Free & Total Chlorine, High Range

HI 95734

The HI 95734 measures high range free and total chlorine content in water samples in the 0.00 to 10.00 mg/L (ppm) range.

SPECIFICATIONS		Model Number >	HI 95711	HI 95734	HI 95701	HI 95761	HI 95762
Range	0.00 to 5.00 mg/L Total Cl ₂		•				
	0.00 to 10.00 mg/L Total Cl ₂			•			
	0.000 to 0.500 mg/L Total Cl ₂					•	
	0.00 to 5.00 mg/L Free Cl ₂		•		•		
	0.00 to 10.00 mg/L Free Cl ₂			•			
	0.000 to 0.500 mg/L Free Cl ₂						•
Resolution	0.01 mg/L from 0.0 to 3.50 mg/L; 0.10 mg/L above 3.50 mg/L		•	•	•		
	0.001 mg/L					•	•
Precision	±0.02 mg/L @ 1.00 mg/L		•		•		
	±0.004 mg/L @ 0.200 mg/L					•	•
	±0.06 mg/L @ 3.00 mg/L			•			
Typical EMC Deviation	±0.01 mg/L		•	•	•		
	±0.001 mg/L					•	•
Light Source	Tungsten lamp with narrow band interference filter @ 525 nm						
Light Detector	Silicon Photocell						
Method	USEPA 330.5 and Standard Method 4500-Cl G		•	•	•		
	USEPA 330.5					•	
	Standard Method 4500-Cl G						•
Environment	0 to 50°C (32 to 122°F) max 95% RH non-condensing						
Battery Type	1 x 9V						
Auto-off	After 10 minutes of non-use in measurement mode and after 1 hour of non-use in calibration mode						
Dimensions	180 x 83 x 46 mm (7.1 x 3.3 x 1.8")						
Weight	290 g (10 oz.)						

Chlorine Photometers with Exclusive Cal Check™ Feature



**Free
for Drinking Water**

Free Chlorine for Drinking Water

HI 95762

Designed for drinking water applications, the HI 95762 measures free chlorine content in water samples in the 0.000 to 0.500 mg/L (ppm) range.



Trace

Trace Total Chlorine

HI 95761

Designed for very low total chlorine concentrations, the HI 95761 measures in the 0.000 to 0.500 mg/L (ppm) range.



Free

Free Chlorine

HI 95701

The HI 95701 measures free chlorine content in water samples in the 0.00 to 5.00 mg/L (ppm) range.

ORDERING INFORMATION:

HI 95701 and HI 95762 are supplied complete with 2 cuvetts, battery and instructions.

HI 95701C and HI 95762C kit includes meter, rugged carrying case, scissors, tissue for wiping cuvetts and Cal Check™ standard.

HI 95761 and HI 95711 are supplied complete with 2 measuring cuvetts, 9V battery and instructions.

HI 95761C and HI 95711C kit includes the meter in a rugged carrying case, Cal Check™ standard and accessories.

HI 95734 is supplied complete with 2 measuring cuvetts, 9V battery and instructions.

HI 95734C kit includes HI 95734, rugged carrying case, scissors, tissue for wiping cuvetts and Cal Check™ standard.

ACCESSORIES:

HI 95711

HI 93701-01 100 free Cl₂ tests

HI 93701-03 300 free Cl₂ tests

HI 93711-01 100 total Cl₂ tests

HI 93711-03 300 total Cl₂ tests

HI 95701-11 CAL CHECK™ 0.00

& 1.00 ppm free Cl₂ standards

HI 95711-11 CAL CHECK™ 0.00

& 1.00 ppm total Cl₂ standards

HI 95734

HI 93734-01 100 f or t Cl₂ tests

HI 93734-03 300 f or t Cl₂ tests

HI 95734-11 CAL CHECK™ 0.00

& 4.00 ppm f & t Cl₂ standards

HI 95701

HI 93701-01 100 free Cl₂ tests

HI 93701-03 300 free Cl₂ tests

HI 95701-11 CAL CHECK™ 0.00

& 1.00 ppm free Cl₂ standards

HI 95761

HI 95761-01 100 total Cl₂ tests

HI 95761-03 300 total Cl₂ tests

HI 95761-11 CAL CHECK™ 0.000

& 0.400 ppm total Cl₂ standards

HI 95762

HI 95762-01 100 free Cl₂ tests

HI 95762-03 300 free Cl₂ tests

HI 95762-11 CAL CHECK™ 0.000

& 0.400 ppm free Cl₂ standards

Single Parameter Photometers



ACCESSORIES

- HI 710009** Blue protective rubber boot
- HI 710010** Orange protective rubber boot
- HI 721310** 9V battery (10 pcs)
- HI 731318** Tissue for wiping cuvettes (4 pcs)
- HI 731331** Glass cuvettes (4 pcs)
- HI 731335** Caps for cuvettes (4 pcs)
- HI 93703-50** Cuvet cleaning solution (230 mL)
- HI 740218** Deluxe hard carrying case with pre-cut foam

Dedicated, dependable results.

Hanna colorimeters are dedicated to a specific ion and unlike conventional spectrophotometers and Ion Selective Electrodes, are fast and simple to use. There aren't any problems associated with Ion Selective Electrodes such as preparation time, expensive additives, temperature compensation or slow response time! Hanna Colorimeters use a state-of-the-art custom micro-processor with a diode photocell to detect a single parameter. The readings are shown in large digits on a clear LCD. No need to worry about matching up colors or guessing where one color zone starts and the other finishes as with chemical test kits or test strips.

■ Lightweight & Portable

Weighing less than 300 grams or 11 ounces, these portable meters are ideal for spot-checks at landfills, streambeds, water sources or inside the lab!

■ Quick & Simple-to-Use

Just zero your sample, dissolve a readily soluble powder or add a few drops of a reagent in the cuvet and take a reading.

■ Long Battery Life

These meters have a battery life lasting a minimum of 300 tests and an auto shut-off feature, guaranteeing long periods of trouble-free operation. No surprises with these meters! The display will give a low battery warning and a few extra measurements before new batteries are necessary.

■ Tests Made Inexpensive

Each Hanna meter comes supplied complete with cuvettes. A wide selection of inexpensive reagents for 100 or 300 tests further reduces the cost-per-test.

The meters will in fact cost less than the several test kits needed to cover the same range!

Single Parameter Photometers

SPECIFICATIONS				
Description	Code	Range	Increment	Method
Aluminum	HI 93712	0.00 to 1.00 mg/L	0.01 mg/L	Aluminon
Ammonia, High Range	HI 93733	0.0 to 50.0 mg/L	0.1 mg/L	Nessler
Ammonia, Medium Range	HI 93715	0.00 to 9.99 mg/L	0.01 mg/L	Nessler
Ammonia, Low Range	HI 93700	0.00 to 3.00 mg/L	0.01 mg/L	Nessler
Bromine	HI 93716	0.00 to 8.00 mg/L	0.01 mg/L	DPD
Chloride	HI 93753	0.0 to 20.0 mg/L	0.01 mg/L	Mercury (II) thiocyanate
Chlorine, Free	HI 93701	0.00 to 2.50 mg/L	0.01 mg/L	DPD
Chlorine, Free and Total	HI 93734	0.00 to 9.99 mg/L	0.01 mg/L	DPD
Chlorine, Free and Total	HI 93711	0.00 to 2.50(f)/3.50(t)mg/L	0.01 mg/L	DPD
Chlorine Dioxide	HI 93738	0.00 to 2.00 mg/L	0.01 mg/L	Chlorophenol Red
Chromium VI, High Range	HI 93723	0 to 1000 µg/L	1 µg/L	Diphenylcarbohydrazide
Chromium VI, Low Range	HI 93749	0 to 300 µg/L	1 µg/L	Diphenylcarbohydrazide
Color	HI 93727	0 to 500 PCU	10 PCU	Chloroplatinate
Copper, High Range	HI 93702	0.00 to 5.00 mg/L	0.01 mg/L	Bicinchoninate
Copper, Low Range	HI 93747	0 to 990 µg/L	1 µg/L	Bicinchoninate
Cyanide	HI 93714	0.000 to 0.200 mg/L	0.001 mg/L	Pyridine-Pyrazalone
Cyanuric Acid	HI 93722	0 to 80 mg/L	1 mg/L	Turbidimetric
Fluoride, High Range	HI 93739	0.0 to 20.0 mg/L	0.1 mg/L	SPADNS
Fluoride, Low Range	HI 93729	0.00 to 2.00 mg/L	0.01 mg/L	SPADNS
Hardness, Ca	HI 93720	0.00 to 2.70 mg/L	0.01 mg/L	Calmagite
Hardness, Mg	HI 93719	0.00 to 2.00 mg/L	0.01 mg/L	Colorimetric
Hardness, Total	HI 93735	0 to 750 mg/L	1 / 5 mg/L	EPA 130.1
Hydrazine	HI 93704	0 to 400 µg/L	1 µg/L	p-Dimethylaminobenzaldehyde
Iodine	HI 93718	0.0 to 12.5 mg/L	0.1 mg/L	DPD
Iron, High Range	HI 93721	0.00 to 5.00 mg/L	0.01 mg/L	Phenantroline
Iron, Low Range	HI 93746	0 to 400 µg/L	1 µg/L	TPTZ
Manganese, High Range	HI 93709	0.0 to 20.0 mg/L	0.1 mg/L	Periodate Oxidation
Manganese, Low Range	HI 93748	0 to 300 µg/L	1 µg/L	PAN
Molybdenum	HI 93730	0.0 to 40.0 mg/L	0.1 mg/L	Mercaptoacetic Acid
Nickel HR	HI 93726	0.00 to 7.00 g/L	0.01 g/L	Photometric
Nickel LR	HI 93740	0.000 to 1.000 mg/L	0.001 mg/L	PAN
Nitrate	HI 93728	0.0 to 30.0 mg/L	0.1 mg/L	Cadmium Reduction
Nitrite, High Range	HI 93708	0 to 150 mg/L	1 mg/L	Ferrous Sulfate
Nitrite, Low Range	HI 93707	0.00 to 0.35 mg/L	0.01 mg/L	Diazotation
Oxygen, Dissolved	HI 93732N	0.0 to 10.0 mg/L	0.1 mg/L	Modified Winkler
Phosphate, High Range	HI 93717	0.0 to 30.0 mg/L	0.1 mg/L	Amino Acid
Phosphate, Low Range	HI 93713	0.00 to 2.50 mg/L	0.01 mg/L	Ascorbic Acid
Phosphorus	HI 93706	0.0 to 15.0 mg/L	0.1 mg/L	Amino Acid
Potassium	HI 93750	0.00 to 50.0 mg/L	0.05/0.1 mg/L	Turbidimetric
Silica	HI 93705	0.00 to 2.00 mg/L	0.01 mg/L	Heteropoly Blue
Silver	HI 93737	0.000 to 1.000 mg/L	0.001 mg/L	PAN
Sulfate	HI 93751	0 to 150 mg/L	1 mg/L	Turbidimetric
Zinc	HI 93731	0.00 to 3.00 mg/L	0.01 mg/L	Zincon

Reagents

Test	Reagent Kit	No. of Tests
Alkalinity	HI 93755-01	100
	HI 93755-03	300
Aluminum	HI 93712-01	100
	HI 93712-03	300
Ammonia HR	HI 93764B-25	25
	HI 93733-01	100
Ammonia MR	HI 93733-03	300
	HI 93715-01	100
Ammonia LR	HI 93715-03	300
	HI 93700-01	100
Bromine	HI 93700-03	300
	HI 93764A-25	25
Calcium and Magnesium	HI 93716-01	100
	HI 93716-03	300
Chloride	HI 93752-01	100
	HI 93752-03	100
Chlorine Dioxide	HI 93753-01	100
	HI 93753-03	300
Chlorine UHR	HI 93738-01	100
	HI 93738-03	300
Chlorine, Free	HI 95771-01	100
	HI 95771-03	300
Chlorine, Free and Total, HR	HI 93701-01	100
	HI 93701-03	300
	HI 93701-F	300
Chlorine, Free ULR	HI 93734-01	100
	HI 93734-03	300
Chlorine, Total	HI 95762-01	100
	HI 95762-03	300
	HI 93711-01	100
Chlorine, Total ULR	HI 93711-03	300
	HI 93701-T	300
	HI 95761-01	100
Chromium VI HR	HI 95761-03	300
	HI 93723-01	100
Chromium VI LR	HI 93723-03	300
	HI 93749-01	100
COD, HR	HI 93749-03	300
COD, LR EPA*	HI 93754C-25	25
COD, LR ISO**	HI 93754A-25	25
COD, LR Mercury Free***	HI 93754F-25	25
COD, MR EPA*	HI 93754D-25	25
COD, MR ISO**	HI 93754B-25	25
COD, MR Mercury Free***	HI 93754G-25	25
Copper HR	HI 93754E-25	25
	HI 93702-01	100
Copper HR, Total	HI 93702-03	300
	HI 93702T-01	100
Copper LR	HI 93702T-03	300
	HI 95747-01	100
Cyanide	HI 95747-03	300
	HI 93714-01	100
Cyanuric Acid	HI 93714-03	300
	HI 93722-01	100
Detergents, Anionic	HI 93722-03	300
	HI 95769-01	40
Fluoride HR	HI 93739-01	100
	HI 93739-03	300
Fluoride LR	HI 93729-01	100
	HI 93729-03	300
Hardness (Calcium)	HI 93720-01	100
	HI 93720-03	300

Test	Reagent Kit	No. of Tests
Hardness (Magnesium) and Total Hardness	HI 93719-01	100
	HI 93719-03	300
Hardness, Total HR	HI 93735-02	100
Hardness, Total LR	HI 93735-00	100
Hardness, Total LR+MR+HR	HI 93735-0	100
Hardness, Total MR	HI 93735-01	100
Hydrazine	HI 93704-01	100
	HI 93704-03	300
Iodine	HI 93718-01	100
	HI 93718-03	300
Iron HR	HI 93721-01	100
	HI 93721-03	300
Iron LR	HI 93746-01	50
	HI 93746-03	150
Manganese HR	HI 93709-01	100
	HI 93709-03	300
Manganese LR	HI 93748-01	50
	HI 93748-03	150
Molybdenum	HI 93730-01	100
	HI 93730-03	300
Nickel HR	HI 93726-01	100
	HI 93726-03	300
Nickel LR	HI 93740-01	50
	HI 93740-03	150
Nitrate	HI 93728-01	100
	HI 93728-03	300
	HI 93766-50	50
Nitrite HR	HI 93708-01	100
	HI 93708-03	300
Nitrite LR	HI 93707-01	100
	HI 93707-03	300
Nitrogen, Total HR	HI 93767B-50	50
Nitrogen, Total LR	HI 93767A-50	50
Oxygen, Dissolved (D.O.)	HI 93732-01	100
	HI 93732-03	300
Ozone	HI 93757-01	100
	HI 93757-03	300
pH	HI 93710-01	100
	HI 93710-03	300
Phosphate HR	HI 93717-01	100
	HI 93717-03	300
Phosphate LR	HI 93713-01	100
	HI 93713-03	300
Phosphorus	HI 93706-01	100
	HI 93706-03	300
Phosphorus, Acid and Hydrolyzable	HI 93758B-50	50
Phosphorus Reactive HR	HI 93763A-50	50
Phosphorus Reactive LR	HI 93758A-50	50
Phosphorus Total HR	HI 93763B-50	50
Phosphorus Total LR	HI 93758C-50	50
Potassium	HI 93750-01	100
	HI 93750-03	300
Silica	HI 93705-01	100
	HI 93705-03	300
Silver	HI 93737-01	50
	HI 93737-03	150
Sulphate	HI 93751-01	100
	HI 93751-03	300
Zinc	HI 93731-01	100
	HI 93731-03	300

* The chromium-sulphuric acid method is officially recognized by EPA for wastewater test

** HI 93754F-25 and HI 93754G-25 method is according to ISO 15705 method

*** Recommended method for generic test and for samples without chloride

HI 93703 Portable Logging Turbidity Meter



SPECIFICATIONS

Range

0.00 to 50.00 FTU*; 50 to 1000 FTU*

Resolution

0.01 FTU (0.00 to 50.00 FTU);
1 FTU (50 to 1000 FTU)

Accuracy

±0.5 FTU or ±5% of reading (whichever is greater)

Calibration

3-points (0 FTU, 10 FTU and 500 FTU)

Light Source

infrared LED

Light Source Life

life of the instrument

Light Detector

silicon photocell

Battery Type/Life

4 x 1.5V AA/approx. 60 hours of continuous use
or 900 measurements; auto-off after 5 minutes
of non-use

Environment

0 to 50°C (32 to 122°F);
RH max 95% (non condensing)

Dimensions

220 x 82 x 66 mm (8.7 x 3.2 x 2.6")

Weight

510 g (1.1 lb.)

HI 93703-11

Same as HI 93703 with additional features:

Data Logging

199 measurements, on-demand

PC Connection

through serial port and HI 92000 Windows®
compatible software (not included)

Real Time Clock

yes

* 1 FTU (Formazine Turbidity Unit) = 1 FNU Formazine Nephelometric Unit



HI 93703 series are microprocessor based turbidity meters that provide laboratory precision for field turbidity measurements. HANNA instruments® HI 93703 is designed to provide you a simple yet accurate way to test turbidity on-site. These meters have two operating ranges; 0.00 to 50.00 FTUs, and 50 to 1000 FTUs that can accommodate the most turbid condition you may encounter. The HI 93703 is easy to calibrate (with 3 point calibration) using AMCO-EPA standards and is ISO 7027 compliant.

The HI 93703-11 enhanced version features a real-time clock and internal logging for up to 199 measurements. Collected data can be downloaded to your management system using the Windows® compatible HI 92000 software.

Both versions meet the requirements of GLP (Good Laboratory Practice) protocols for last calibration data storage.

ORDERING INFORMATION:

HI 93703 is supplied complete with glass cuvet, batteries and instructions.

HI 93703-11 is supplied complete with glass cuvet, batteries and instructions,

HI 93703C kit including HI 93703 and HI 731313 maintenance kit.

ACCESSORIES:

HI 731318 Tissue for wiping cuvetts (4 pcs)

HI 731321 Spare glass cuvet (4 pcs)

HI 731313 Maintenance kit: rugged carrying case including HI 93102-0 and HI 93102-20 calibration solutions, HI 93703-50 cuvet cleaning solution, 1 tissue for wiping cuvetts and 2 cuvetts

HI 93703-0 AMCO-AEPA-1@ 0 FTU calibration solution (30 mL)

HI 93703-05 AMCO-AEPA-1 @ 500 FTU calibration solution (30 mL)

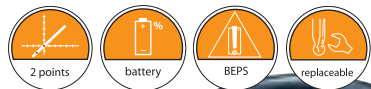
HI 93703-10 AMCO-AEPA-1 @ 10 FTU calibration solution (30 mL)

HI 92000 Windows® compatible application software

HI 920011 Serial cable (5 to 9 pin) for PC connection

Windows® is a registered Trademark of Microsoft Co.

pHep®4 • pHep®5 Waterproof pH/Temperature Testers



Automatic temperature compensation

Dual-level LCD

Automatic calibration

Automatic shut-off

Floating, waterproof casing

Replaceable pH electrode cartridge

"Direct Contact" temperature probe

When Hanna Instruments introduced its first version of the pHep® (pH Electronic Paper) in 1986, it immediately revolutionized the measurement of pH. The pHep®'s ease of use in combination with its affordability made it possible for non-technical and technical personnel alike to measure pH on the spot accurately and inexpensively throughout a variety of industries.

We at Hanna have always valued the comments and suggestions coming from our customers. For this new series, we have included all of the features users have asked for and more! The pHep®4 and pHep®5 include features such as a dual-level LCD, battery level indicator, replaceable pH electrode cartridge, stability indicator, automatic shut-off and automatic calibration all in a floating, waterproof casing.



Replaceable pH Electrode

Hanna's exclusive cartridge pH electrode. Electrode replacement with the stainless steel round connector means there are no pins to bend or break during replacement.



Cloth re-newable junction

When the cloth junction becomes dirty from routine testing, simply pull out 3 mm (1/8") to rejuvenate the electrode.

SPECIFICATIONS

Range

HI 98127: -2.0 to 16.0 pH; -5.0 to 60.0°C/23.0 to 140.0°F

HI 98128: -2.00 to 16.00 pH; -5.0 to 60.0°C/23.0 to 140.0°F

Resolution

HI 98127: 0.1 pH; 0.1°C/0.1°F

HI 98128: 0.01 pH; 0.1°C/0.1°F

Accuracy (@20°C/68°F)

HI 98127: ±0.1 pH; ±0.5°C/±1°F

HI 98128: ±0.05 pH; ±0.5°C/±1°F

pH Calibration

automatic, at 1 or 2 points with 2 sets of memorized buffers (pH 4.01/7.01/10.01 or pH 4.01/6.86/9.18)

Temperature Compensation

automatic

Battery Type/Life

4 x 1.5V with BEPS/approx. 300 hours of continuous use; auto-off after 8 minutes of non-use

Environment

-5 to 50°C (23 to 122°F); RH max 100%

Dimensions

163 x 40 x 26 mm (6.4 x 1.6 x 1.0")

Weight

100 g (3.5 oz.)



Dual-level LCD Display
Simultaneous display of measurement reading and temperature.



On-screen Battery Life
When turned on, the LCD indicates the percentage of battery power remaining.



HOLD Function
The HOLD function temporarily "freezes" the LCD display.



Standard or N.I.S.T Buffer Calibration
Automatic calibration is performed with 2 sets of memorized buffers for greater accuracy.

ORDERING INFORMATION:

HI 98127 (pHep®4) is supplied complete with protective cap, electrode removal tool, batteries and instructions.

HI 98128 (pHep®5) is supplied complete with protective cap, electrode removal tool, batteries and instructions.

ACCESSORIES:

HI 73127 Spare electrode for HI 98127 and HI 98128

HI 70004P pH 4.01 buffer solution, 20 mL sachet, 25 pcs.

HI 70006P pH 6.86 buffer solution, 20 mL sachet, 25 pcs.

HI 70007P pH 7.01 buffer solution, 20 mL sachet, 25 pcs.

HI 70009P pH 9.18 buffer solution, 20 mL sachet, 25 pcs.

HI 70010P pH 10.01 buffer solution, 20 mL sachet, 25 pcs.

HI 7061M Cleaning solution, 230 mL bottle

HI 73128 Electrode removal tool

HI 98106 • HI 98107 • HI 98108 Electronic pH Testers

SPECIFICATIONS

Range

0.0 to 14.0 pH

Resolution

0.1 pH

Accuracy (@20°C/68°F)

HI 98106 (Champ®): ±0.2 pH

HI 98107 (pHep®): ±0.1 pH

HI 98108 (pHep®+): ±0.1 pH

Calibration

HI 98106 (Champ®): manual, 1 point

HI 98107 (pHep®): manual, 1 point

HI 98108 (pHep®+): manual, 2 points

Temperature Compensation

HI 98108 (pHep®+) only

automatic, 0 to 50°C

Battery Type/Life

HI 98106 (Champ®): 4 x 1.5V/approx. 800 hours*

HI 98107 (pHep®): 4 x 1.5V/approx. 700 hours*

HI 98108 (pHep®+): 4 x 1.5V/approx. 700 hours*

* Based on continuous use.

Environment

0 to 50°C (32 to 122°F); RH max 95%

Dimensions

175 x 41 x 23 mm (6.9 x 1.6 x 0.9")

Weight

95 g (3.4 oz.)



Introduced in 1986, the pHep® revolutionized pH measurement by providing everyone with a simple, inexpensive pocket pH tester. Thanks to over two decades of manufacturing experience, this series of pH testers has been completely re-designed: today, the pHep® family features a casing that is rugged and ergonomically enhanced to fit your hand. The design of these testers also features a larger LCD so measurements are easier to read from any angle. Each instrument in the pHep® family comes with a protective cap that can be used as a measurement vessel. With the latest innovation of a nonlogging fiber junction the new pHep® meters last much longer. You can simply pull out 1-2 mm (1/8") of the junction fiber to completely renew it. The temperature sensor of the pHep®+ is exposed for rapid temperature compensation. These testers are the standard in quick, on-the-spot pH testing.

ORDERING INFORMATION:

HI 98106 (Champ®) is supplied complete with protective cap, calibration screwdriver, batteries and instructions.

HI 98107 (pHep®) is supplied complete with protective cap, calibration screwdriver, batteries and instructions.

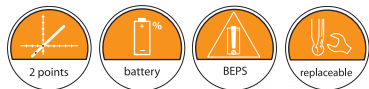
HI 98108 (pHep®+) is supplied complete with protective cap, calibration screwdriver, batteries and instructions.

ACCESSORIES:

HI 73108*	Spare electrode for HI 98108	HI 7004M	pH 4.01 buffer solution, 230 mL bottle
HI 73106*	Spare electrode for HI 98106 and HI 98107	HI 7007M	pH 7.01 buffer solution, 230 mL bottle
HI 70004P	pH 4.01 buffer solution, 20 mL sachet, 25 pcs.	HI 7010M	pH 10.01 buffer solution, 230 mL bottle
HI 70007P	pH 7.01 buffer solution, 20 mL sachet, 25 pcs.	HI 70300M	Electrode storage solution, 230 mL bottle
HI 70010P	pH 10.01 buffer solution, 20 mL sachet, 25 pcs.	HI 7061M	Cleaning solution, 230 mL bottle

* To be replaced by authorized technical personnel only.

HI 98121 ORP/pH/Temperature Waterproof Tester



Automatic temperature compensation

Dual-level LCD

Automatic calibration

Automatic shut-off

Floating, waterproof casing

"Direct Contact" temperature probe

Replaceable pH electrode cartridge

The Combo series of combination waterproof testers with advanced functions now includes the new model HI 98121 for simultaneous pH and ORP measurements. HI 98121 also reads temperature, which is continuously displayed on the dual level LCD. The pH electrode fiber junction can be easily pulled out for replenishment. The pH electrode cartridge can be quickly replaced with the supplied electrode removal tool. The encapsulated external stainless steel temperature sensor provides a fast response due to its close proximity to the pH electrode.

HI 98121 works with common batteries and when turned on, displays the percentage of remaining battery life. The stability indicator ensures reliable readings. The body is ergonomically designed and the meter will float if dropped into water.

SPECIFICATIONS

Range

ORP: ± 1000 mV; pH: -2.00 to 16.00 pH
Temperature: -5.0 to 60.0°C / 23.0 to 140.0°F

Resolution

ORP: 1 mV; pH 0.01 pH; Temperature 0.1°C/0.1°F

Accuracy (@20°C)

ORP: ± 2 mV; pH: ± 0.05 pH;
Temperature: $\pm 0.5^\circ\text{C}/\pm 1^\circ\text{F}$

Calibration

ORP: factory calibrated; pH: automatic, 1 or 2 points with 2 sets of memorized buffers (pH 4.01 / 7.01 / 10.01 or 4.01 / 6.86 / 9.18)

Temperature Compensation

automatic for pH readings

Electrodes

HI 73127 replaceable pH electrode (included); fixed ORP sensor

Battery Type/Life

4 x 1.5V with BEPS/approx. 250 hours of continuous use;
auto-off after 8 minutes of non-use

Environment

-5 to 50°C (23 to 122°F); RH max 100%

Dimensions

163 x 40 x 26 mm (6.4 x 1.6 x 1.0")

Weight

100 g (3.5 oz.)



Dual-level LCD Display
Simultaneous display of measurement reading and temperature.



On-screen Battery Life
When turned on, the LCD indicates the percentage of battery power remaining.



HOLD Function
The HOLD function temporarily "freezes" the LCD display.



Stability & ATC Indicators
Stability of pH, EC & TDS measurements are indicated by the timer symbol. The ATC symbol is shown when temp. compensation is active.

ORDERING INFORMATION:

HI 98121 is supplied complete with protective cap, electrode removal tool, batteries and instructions.

ACCESSORIES:

HI 73127	Spare pH electrode
HI 73128	Electrode removal tool
HI 7020M	200/275 mV test solution, 230 mL bottle
HI 7091M	Reducing solution, 230 mL bottle
HI 7092M	Oxidizing solution, 230 mL bottle
HI 70004P	pH 4.01 buffer solution, 20 mL sachet, 25 pcs.

HI 70006P	pH 6.86 buffer solution, 20 mL sachet, 25 pcs.
HI 70007P	pH 7.01 buffer solution, 20 mL sachet, 25 pcs.
HI 70009P	pH 9.18 buffer solution, 20 mL sachet, 25 pcs.
HI 70010P	pH 10.01 buffer solution, 20 mL sachet, 25 pcs.
HI 70300M	Electrode storage solution, 230 mL bottle

HI 98120 ORP/Temperature Waterproof Tester

SPECIFICATIONS

Range

ORP: ± 1000 mV;

Temperature: -5.0 to 60.0°C / 23.0 to 140.0°F

Resolution

ORP: 1 mV; Temperature: 0.1°C / 0.1°F

Accuracy (@ 20°C)

ORP: ± 2 mV; Temperature: $\pm 0.5^{\circ}\text{C}$ / $\pm 1^{\circ}\text{F}$

Calibration

factory calibrated

ORP Electrode

HI 73120 (included)

Battery Type/Life

4 x 1.5V with BEPS / approx. 300 hours of continuous use; auto-off after 8 minutes of non-use

Environment

-5 to 50°C (23 to 122°F); RH max 100%

Dimensions

163 x 40 x 26 mm (6.4 x 1.6 x 1.0")

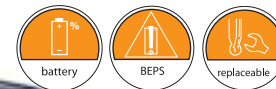
Weight

100 g (3.5 oz.)

This new microprocessor-based tester provides the most advanced solution in ORP measurement:

- Replenishable junction
- Dual level LCD
- Battery life percentage indication
- Stability indicator
- Waterproof and floating body

This tester is factory calibrated and measurements are highly accurate. The HI 73120 ORP electrode is provided with a pull-out cloth junction and can be easily replaced by the user. The encapsulated stainless steel temperature sensor provides a fast response thanks to its external location. All these features ensure a long life to these HANNA instruments® pocket meters!



Dual-level LCD Display
Simultaneous display of measurement reading and temperature.



On-screen Battery Life
When turned on, the LCD indicates the percentage of battery power remaining.



HOLD Function
The HOLD function temporarily "freezes" the LCD display.



Stability & ATC Indicators
Stability of pH, EC & TDS measurements are indicated by the timer symbol. The ATC symbol is shown when temp. compensation is active.

ORDERING INFORMATION:

HI 98120 is supplied complete with protective cap, electrode removal tool, batteries and instructions.

ACCESSORIES:

- HI 73120 Spare electrode for HI 98120
- HI 73128 Electrode removal tool
- HI 7020M 200/275 mV test solution, 230 mL bottle
- HI 7021M 240 mV test solution, 230 mL bottle
- HI 7022M 470 mV test solution, 230 mL bottle
- HI 7091M Reducing solution, 230 mL bottle
- HI 7092M Oxidizing solution, 230 mL bottle

HI 98201 ORP Tester



SPECIFICATIONS

Range

±999 mV

Resolution

1 mV

Accuracy (@20°C/68°F)

±5 mV

Battery Type/Life

4 x 1.5V/approx. 700 hours of continuous use

Environment

0 to 50°C (32 to 122°F); RH max 95%

Dimensions

175 x 41 x 23 mm (6.9 x 1.6 x 0.9")

Weight

95 g (3.4 oz.)

Oxidation is a process in which a molecule or ion loses electrons. This occurs most readily in water treatment as well as pool and spa maintenance where an oxidizer, such as chlorine, is added to the water to destroy contaminants. The higher the ORP value, the greater the sanitizing power of your water. The ORP tester can provide a valuable indication of water quality. HI 98201 is a unique hand-held tester developed for quick and affordable tests. The ORP tester utilizes a platinum electrode and HANNA instruments® unique cloth fiber junction, which can be pulled out when clogging occurs, reactivating the reference and restoring the electrode.

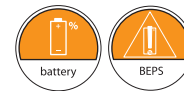
ORDERING INFORMATION:

HI 98201 (ORP) is supplied complete with protective cap, batteries and instructions.

ACCESSORIES:

- HI 73201 Spare electrode for ORP, to be replaced by authorized technical personnel only
- HI 7020M 200/275 mV test solution, 230 mL bottle
- HI 7091M Reducing solution, 230 mL bottle
- HI 7092M Oxidizing solution, 230 mL bottle

DiST[®]7 • DiST[®]8 /EC/TDS Testers with Sample Cell



SPECIFICATIONS:

Range

DiST[®]7: EC: 0 to 3999 μ S/cm; TDS: 0 to 2000 ppm
Temperature: 0.0 to 60.0°C / 32.0 to 140.0°F
DiST[®]8: EC: 0.00 to 20.00 mS/cm; TDS: 0.00 to 10.00 ppt; Temperature: 0.0 to 60.0°C / 32.0 to 140.0°F

Resolution

DiST[®]7: EC: 1 μ S/cm 0.01 mS/cm; TDS: 1 ppm
0.01 ppt; Temperature: 0.1°C / 0.1°F
DiST[®]8: EC: 0.01 mS/cm; TDS: 0.01 ppt;
Temperature: 0.1°C / 0.1°F

Accuracy (@20°C/68°F)

EC \pm 2% F.S.; TDS \pm 2% F.S.;
Temperature: \pm 0.5°C/ \pm 1°F

Calibration

automatic, 1 point

TDS Conversion Factor

adjustable from 0.45 to 1.00

Temperature Compensation

automatic, with β adjustable from 0.0 to 2.4%/°C

Environment

0 to 50°C (32 to 122°F); RH max 100%

Battery Type/Life

4 x 1.5V AA/approx. 2000 hours of continuous use, auto-off after 8 minutes of non-use

Dimensions

120 x 53 x 81 mm (4.7 x 2.1 x 3.2")

Weight

205 g (7.2 oz.)



The DiST[®]7 & DiST[®]8 portable meters from HANNA instruments[®] are designed for quick and easy, high accuracy EC, TDS and temperature measurements. These new waterproof instruments feature a dual-level LCD that displays EC or TDS and °C or °F. These microprocessor meters have been developed in direct response to the requests of users in water treatment, boilers and cooling towers, reverse osmosis and agriculture.

The rugged, easy-to-use DiST[®]7 & DiST[®]8 feature an on board sample cell with built-in funnel, digital readout, push button automatic calibration and automatic temperature compensation. The EC/TDS conversion factor and temperature coefficient (β) are user adjustable for application-specific measurements. At startup the DiST[®]7 & DiST[®]8 perform a self-check and then display the battery level to assure proper working condition. They also have a stability indicator and hold feature to prompt the user when to take the reading and freeze the display for easy and accurate recording.

Choose your model according to the EC/TDS range of your application:

DiST[®]7: 0 to 3999 μ S/cm (EC); 0 to 2000 ppm (TDS)

DiST[®]8: 0.00 to 20.00 mS/cm (EC); 0.00 to 10.00 ppt (TDS)

ORDERING INFORMATION:

DiST[®]7 is supplied complete with calibration solution, batteries and instructions.

DiST[®]8 is supplied complete with calibration solution, batteries and instructions.

ACCESSORIES:

HI 70030P	12880 μ S/cm calibration solution, 20 mL sachet, 25 pcs.	HI 7032M	1382 ppm calibration solution, 230 mL bottle
HI 7030M	12880 μ S/cm calibration solution, 230 mL bottle	HI 70038P	6.44 ppt calibration solution, 20 mL sachet, 25 pcs.
HI 70031P	1413 μ S/cm calibration solution, 20 mL sachet, 25 pcs.	HI 70442P	1500 ppm calibration solution, 20 mL sachet, 25 pcs.
HI 7031M	1413 μ S/cm calibration solution, 230 mL bottle	HI 70442M	1500 ppm calibration solution, 230 mL bottle
HI 70032P	1382 ppm calibration solution, 20 mL sachet, 25 pcs.		

DiST®5 • DiST®6 Waterproof EC/TDS/Temperature Testers

The original DiST® (Dissolved Solids Tester) was first introduced in 1986 by HANNA instruments®. Since then, the measurement of Conductivity and Total Dissolved Solids has never been easier. The DiST®'s ease-of-use, in combination with its affordability, made it the standard in EC and TDS measurement. HANNA instruments® continues the tradition of innovation with the DiST®5 and DiST®6. We at HANNA instruments® have always valued the comments and suggestions coming from our customers. For this series, we have included all the features you have asked for and more! The DiST®5 and DiST®6 include features such as a replaceable graphite electrode, adjustable TDS ratio, temperature in °C or °F, automatic temperature compensation with adjustable β , battery level indicator, stability indicator, automatic shut-off and automatic calibration all in a floating, waterproof casing. This 3-in-1 tester is unmatched in EC/TDS/Temperature measurement!

**Replaceable graphite electrode**

An easy to replace graphite electrode with a sturdy, snap-in connector means there are no pins to bend or break.

High accuracy

The graphite conductivity electrode provides greater accuracy because it cannot be contaminated by salt deposits in the solution.

SPECIFICATIONS:**Range**

DiST®5: EC: 0 to 3999 $\mu\text{S}/\text{cm}$; TDS: 0 to 2000 ppm
Temperature: 0.0 to 60.0°C / 32.0 to 140.0°F
DiST®6: EC: 0.00 to 20.00 mS/cm; TDS: 0.00 to 10.00 ppt; Temperature: 0.0 to 60.0°C / 32.0 to 140.0°F

Resolution

DiST®5: EC: 1 $\mu\text{S}/\text{cm}$ 0.01 mS/cm; TDS: 1 ppm 0.01 ppt; Temperature: 0.1°C / 0.1°F
DiST®6: EC: 0.01 mS/cm; TDS: 0.01 ppt; Temperature: 0.1°C / 0.1°F

Accuracy (@20°C/68°F)

EC: $\pm 2\%$ F.S.; TDS: $\pm 2\%$ F.S.;
Temperature: $\pm 0.5^\circ\text{C}/\pm 1^\circ\text{F}$

Calibration

automatic, 1 point

TDS Conversion Factor

adjustable from 0.45 to 1.00

Temperature Compensation

automatic, with β adjustable from 0.0 to 2.4%/°C

Environment

0 to 50°C (32 to 122°F); RH max 100%

Battery Type/Life

4 x 1.5V AA/approx. 2000 hours of continuous use, auto-off after 8 minutes of non-use

Dimensions

120 x 53 x 81 mm (4.7 x 2.1 x 3.2")

Weight

205 g (7.2 oz.)

**On-screen Battery Life**

When turned on, the LCD indicates the percentage of battery power remaining.

**HOLD Function**

The HOLD function temporarily "freezes" the LCD display.

**Adjustable Temperature Coefficient Factor**

Select any β (BETA) value between 0.0 and 2.4% per °C in increments of 0.1.

**Adjustable TDS Ratio**

For TDS measurements, users can choose a conversion factor between 0.45 and 1.00 in increments of 0.01.

ORDERING INFORMATION:

HI 98311 (DiST®5) is supplied complete with protective cap, batteries, probe removal tool and instructions.

HI 98312 (DiST®6) is supplied complete with protective cap, batteries, probe removal tool and instructions.

ACCESSORIES:

- HI 73311** Spare probe
HI 70030P 12.88 mS/cm calibration solution, 20 mL sachet, 25 pcs.
HI 70031P 1413 $\mu\text{S}/\text{cm}$ calibration solution, 20 mL sachet, 25 pcs.
HI 70032P 1382 ppm calibration solution, 20 mL sachet, 25 pcs.

- HI 70038P** 6.44 ppt calibration solution, 20 mL sachet, 25 pcs.
HI 70442P 1500 ppm calibration solution, 20 mL sachet, 25 pcs.
HI 73128 Probe removal tool

HI 98302 • HI 98303 • HI 98304 EC and TDS Testers

SPECIFICATIONS:

Range

HI 98300/HI 98301: 1999 ppm (mg/L)

HI 98302: 10.00 ppt (g/L)

HI 98303: 1999 μ S/cm

HI 98304: 19.99 mS/cm

Resolution

HI 98300/HI 98301: 1 ppm (mg/L)

HI 98302: 0.01 ppt (g/L)

HI 98303: 1 μ S/cm

HI 98304: 0.01 mS/cm

Accuracy (@20°C/68°F)

$\pm 2\%$ F.S.

TDS Factor

HI 98300/HI 98301: 0.65/0.5

HI 98302: 0.5

HI 98303: —

HI 98304: —

Calibration Solution

HI 98300/HI 98301: HI 70442P/HI 70032P

HI 98302: HI 70038P

HI 98303: HI 70031P

HI 98304: HI 70039P or HI 70030P

Calibration

manual, 1 point

Probe

HI 98300/HI 98301: HI 73301

HI 98302: HI 73302

HI 98303: HI 73303

HI 98304: HI 73304

Temperature Compensation

automatic, 0 to 50°C (32 to 122°F)

Battery Type/Life

4 x 1.5V / approx. 200 hours of continuous use

Environment

0 to 50°C (32 to 122°F); RH max 95%

Dimensions

175 x 41 x 23 mm (6.9 x 1.6 x 0.9")

Weight

95 g (3.4 oz.)



The DiST® testers are reliable, pocket sized instruments that will give you quick and accurate readings of conductivity and TDS. This popular line of Dissolved Solids Testers has been redesigned to offer a host of improvements. The casing has been designed for increased strength, a better fit for holding and a large LCD for easy viewing. The graphite sensors provide better repeatability since they do not oxidize. The casing has been engineered to allow air bubbles to escape. The temperature sensor is exposed to provide faster response time.

HI 98300, HI 98301 (DiST®1) and HI 98302 (DiST®2) perform TDS measurements, while HI 98303 (DiST®3) and HI 98304 (DiST®4) provide conductivity readings. If calibration is necessary, simply submerge the electrode tip into calibration solution and adjust the easily accessible trimmer on the side of the tester.

ORDERING INFORMATION:

HI 98300 (DiST® 1 with TDS factor = 0.65) is supplied complete with protective cap, screwdriver, batteries and instructions.

HI 98301 (DiST® 1 with TDS factor = 0.5) is supplied complete with protective cap, screwdriver, batteries and instructions.

HI 98302 (DiST® 2 with TDS factor = 0.5) is supplied complete with protective cap, screwdriver, batteries and instructions.

HI 98303 (DiST® 3) is supplied complete with protective cap, screwdriver, batteries and instructions.

HI 98304 (DiST® 4) is supplied complete with protective cap, screwdriver, batteries and instructions.

ACCESSORIES:

HI 73301*	Spare probe for HI 98300 and HI 98301
HI 73302*	Spare probe for HI 98302
HI 73303*	Spare probe for HI 98303
HI 73304*	Spare probe for HI 98304
HI 70030P	12.88 mS/cm calibration solution, 20 mL sachet, 25 pcs.
HI 7030M	12.88 mS/cm calibration solution, 230 mL bottle
HI 70031P	1413 μ S/cm calibration solution, 20 mL sachet, 25 pcs.
HI 7031M	1413 μ S/cm calibration solution, 230 mL bottle

HI 70032P	1382 ppm calibration solution, 20 mL sachet, 25 pcs.
HI 7032M	1382 ppm calibration solution, 230 mL bottle
HI 70442P	1500 ppm calibration solution, 20 mL sachet, 25 pcs.
HI 70038P	6.44 ppt calibration solution, 20 mL sachet, 25 pcs.
HI 70039P	5.00 mS/cm calibration solution, 20 mL sachet, 25 pcs.
HI 7039M	5.00 mS/cm calibration solution, 230 mL bottle

* To be replaced by authorized technical personnel only.

HI 98308 (PWT) • HI 98309 (UPW) Water Purity Meters**SPECIFICATIONS****Range***HI 98308 (PWT):* 0.0 to 99.9 $\mu\text{S}/\text{cm}$ *HI 98309 (UPW):* 0.000 to 1.999 $\mu\text{S}/\text{cm}$ **Resolution***HI 98308 (PWT):* 0.1 $\mu\text{S}/\text{cm}$ *HI 98309 (UPW):* 0.001 $\mu\text{S}/\text{cm}$ **Accuracy (@20°C/68°F)** $\pm 2\%$ F.S.**Calibration***HI 98308 (PWT):* manual, 1 point*HI 98309 (UPW):* factory calibrated**Temperature Compensation***HI 98308 (PWT):* automatic, 0 to 50°C (32 to 122°F)*HI 98309 (UPW):* —**Battery Type/Life***HI 98308 (PWT):* 4 x 1.5 / approx. 250 hours of continuous use*HI 98309 (UPW):* 4 x 1.5V / approx. 120 hours of continuous use**Environment**

0 to 50°C (32 to 122°F); RH max 95%

Dimensions

175 x 41 x 23 mm (6.9 x 1.6 x 0.9")

Weight

95 g (3.4 oz.)

Pure Water Test (PWT) enables you to check the purity of your distilled or demineralized water in laboratory or industrial environments. Ultra Pure Water (UPW) is an ideal tester for Megohm checks. PWT is ideally suited for fields such as Printed Circuit Board washing, laundry, steam cleaning, checking car battery water and all areas where distilled, demineralized or pure water is used. UPW is the first pure water tester to measure in 1/1000ths of micro-siemens and provides on-the-spot and fast checks of minute traces of contamination in your water, assuring high quality of finished products in processes. These testers are housed in a durable case that provides excellent protection against harsh industrial environments. The casing also features a larger LCD than previous models and is easier to handle with a more ergonomic shape.

Resistance of distilled/deionized water	Equivalent UPW reading
1 M Ω	1.000 $\mu\text{S}/\text{cm}$
2 M Ω	0.500 $\mu\text{S}/\text{cm}$
5 M Ω	0.200 $\mu\text{S}/\text{cm}$
10 M Ω	0.100 $\mu\text{S}/\text{cm}$
15 M Ω	0.067 $\mu\text{S}/\text{cm}$
20 M Ω	0.050 $\mu\text{S}/\text{cm}$

Some typical conversions of measurements performed with PWT		
$\mu\text{S}/\text{cm}$ reading	Resistivity	mg/L of NaCl
99.9	10 K Ω	48
10	100 K Ω	4.6
1	1 M Ω	0.4
0.1	10 M Ω	0.02

ORDERING INFORMATION:**HI 98308 (PWT)** is supplied complete with protective cap, calibration screwdriver, batteries and instructions.**HI 98309 (UPW)** is supplied complete with protective cap, batteries and instructions.**ACCESSORIES:****HI 73308** Spare probe for HI 98308, to be substituted by authorized technical personnel only**HI 73309** Spare probe for HI 98309, to be substituted by authorized technical personnel only**HI 70033P** 84 $\mu\text{S}/\text{cm}$ calibration solution, 20 mL sachet, 25 pcs.**HI 7033M** 84 $\mu\text{S}/\text{cm}$ calibration solution, 230 mL bottle

HI 98202 (pNa) • HI 98203 (SALINTEST) Salt and Hardness Testers

SPECIFICATIONS

Range

0.0 to 3.0 pNa (23 to 0.023 g/L Na⁺)

Resolution

0.1 pNa

Accuracy (@20°C/68°F)

±0.2 pNa

Calibration

manual, 1 point

Battery Type/Life

4 x 1.5V / approx. 800 hours of continuous use

Environment

0 to 50°C (32 to 122°F); RH max 95%

Dimensions

175 x 41 x 23 mm (6.9 x 1.6 x 0.9")

Weight

95 g (3.4 oz.)

SPECIFICATIONS

Range

0.00 to 1.00 pNaCl (58.4 to 5.84 g/L NaCl)

Resolution

0.01 pNaCl

Accuracy (@20°C/68°F)

±0.02 pNaCl

Calibration

manual, 1 point

Battery Type/Life

4 x 1.5V/approx. 500 hours of continuous use

Environment

0 to 50°C (32 to 122°F); RH max 95%

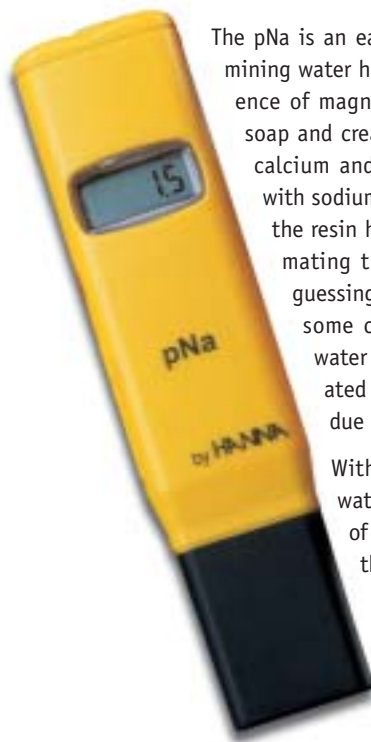
Dimensions

175 x 41 x 23 mm (6.9 x 1.6 x 0.9")

Weight

95 g (3.4 oz.)

HI 98202 (pNa) Water Hardness Tester



The pNa is an easy-to-use and inexpensive instrument for determining water hardness/softness. The hardness of water is due to the presence of magnesium and calcium. These make washing difficult, waste soap and create unpleasant scum and scale. With a zeolite system, the calcium and magnesium ions are substituted on a one-to-one basis with sodium ions from a resin. Once all the sodium ions are exhausted, the resin has to be regenerated. This is currently determined by estimating the volume of water that goes through the softener and guessing when to change the resin! Even though this may work in some cases, it fails in most since the sodium content of feed water is never constant. As a result, either the resin is regenerated too early, waste of resources, or too late, causing damage due to scaling.

With the pNa, you can measure the sodium content of feed water and exit water in seconds. When the resin is exhausted of sodium, there will be no exchange and the pNa will read the same value at the two ends. Only then should the resin be changed. pNa takes guess work out of resin regeneration!

ORDERING INFORMATION:

HI 98202 (pNa) is supplied complete with protective cap, calibration screwdriver, batteries and instructions.

ACCESSORIES:

- HI 73202** Spare electrode for HI 98202 and HI 98203, to be substituted by authorized technical personnel only
- HI 7080M** 2.3 g/L Na⁺ solution, 230 mL bottle

- HI 7080L** 2.3 g/L Na⁺ solution, 500 mL bottle
- HI 7061M** Cleaning solution, 230 mL bottle



HI 98203 (SALINTEST) Salt Content of Water Tester

The SALINTEST can help you monitor the concentration of sodium chloride, assuring high quality in industrial applications. HANNA instruments® has reengineered this compact salt tester with a more durable, ergonomic casing and a larger LCD.

SALINTEST is also ideal for checking salt concentrations in live fish storage tanks, tropical fish aquariums, refrigerated storage and oceanographic investigation.

ORDERING INFORMATION:

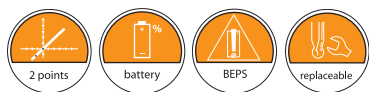
HI 98203 (SALINTEST) is supplied complete with protective cap, calibration screwdriver, batteries and instructions. SALINTEST is also supplied with a handy chart that converts readings into g/L of sodium chloride.

ACCESSORIES:

- HI 73202** Spare electrode for HI 98202 and HI 98203, to be substituted by authorized technical personnel only
- HI 7081M** 30 g/L NaCl solution, 230 mL bottle



- HI 7081L** 30 g/L NaCl solution, 500 mL bottle
- HI 7061M** Cleaning solution, 230 mL bottle

HI 98129 • HI 98130 pH/EC/TDS Testers

The HI 98129 and HI 98130 Combo waterproof testers offer high accuracy pH, EC/TDS and temperature measurements in a single tester! No more switching between meters for your routine measurements.

The waterproof Combo (it even floats) has a large easy-to-read, dual-level LCD and automatic shut off. pH and EC/TDS readings are automatically compensated for the effects of temperature (ATC). This technologically advanced tester has a replaceable pH electrode cartridge with an extendable cloth junction as well as an EC/TDS graphite electrode that resists contamination by salts and other substances. This gives these meters a greatly extended life. Your tester no longer needs to be thrown away when the pH sensor is exhausted. The EC/TDS conversion factor is user selectable as well as the temperature compensation coefficient (β). Fast, efficient, accurate and portable, the Combo pH, EC/TDS and temperature tester brings you all the features you've asked for and more!

High accuracy

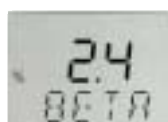
The graphite conductivity electrode provides greater accuracy because it cannot be contaminated by salt deposits in the solution. The exposed temperature sensor provides fast response times, and guarantees accurate temperature compensated readings.

**On-screen Battery Life**

When turned on, the LCD indicates the percentage of battery power remaining.

**HOLD Function**

The HOLD function temporarily "freezes" the LCD display.

**Adjustable Temperature Coefficient Factor**

Select any β (BETA) value between 0.0 and 2.4% per °C in increments of 0.1.

**Adjustable TDS Ratio**

For TDS measurements, users can choose a conversion factor between 0.45 and 1.00 in increments of 0.01.

ORDERING INFORMATION:

HI 98129 is supplied complete with protective cap, electrode removal tool, batteries and instructions.

HI 98130 is supplied complete with protective cap, electrode removal tool, batteries and instructions.

ACCESSORIES:

HI 73127 Spare pH electrode for Combo

HI 73128 Electrode removal tool

HI 70004P pH 4.01 buffer solution, 20 mL sachet, 25 pcs.

HI 70006P pH 6.86 buffer solution, 20 mL sachet, 25 pcs.

HI 70007P pH 7.01 buffer solution, 20 mL sachet, 25 pcs.

HI 70009P pH 9.18 buffer solution, 20 mL sachet, 25 pcs.

HI 70010P pH 10.01 buffer solution, 20 mL sachet, 25 pcs.

HI 70030P 12.88 mS/cm buffer solution, 20 mL sachet, 25 pcs.

HI 70031P 1413 μ S/cm buffer solution, 20 mL sachet, 25 pcs.

HI 70032P 1382 ppm buffer solution, 20 mL sachet, 25 pcs.

HI 70038P 6.44 ppt buffer solution, 20 mL sachet, 25 pcs.

HI 70442P 1500 ppm buffer solution, 20 mL sachet, 25 pcs.

HI 70300M Electrode storage solution, 230 mL bottle

HI 7061M Cleaning solution, 230 mL bottle

SPECIFICATIONS**Range**

pH: 0.00 to 14.00 pH;

EC: 0 to 3999 μ S/cm 0.00 to 20.00 mS/cm;

TDS: 0 to 2000 ppm 0.00 to 10.00 ppt;

Temperature: 0.0 to 60.0°C / 32.0 to 140.0°F;

Resolution

pH: 0.01 pH;

EC: 1 μ S/cm 0.01 mS/cm;

TDS: 1 ppm 0.01 ppt;

Temperature: 0.1°C / 0.1°F;

Accuracy (@20°C/68°F)

pH: ± 0.05 pH;

EC/TDS: $\pm 2\%$ F.S.;

Temperature: $\pm 0.5^\circ\text{C} / \pm 1^\circ\text{F}$;

Temperature Compensation

pH: automatic;

EC/TDS: automatic with β adjustable from 0.0 to 2.4% / °C

Calibration

pH automatic, 1 or 2 points with 2 sets of memorized buffers (pH 4.01 / 7.01 / 10.01 or 4.01 / 6.86 / 9.18);

EC / TDS: automatic, 1 point

TDS Conversion Factor

Adjustable, from 0.45 to 1.00

pH Electrode

HI 73127 (replaceable; included)

Environment

0 to 50°C (32 to 122°F); RH max 100%

Battery Type / Life

4 x 1.5V / approx. 100 hours of continuous use, auto-off after 8 minutes of non-use

Dimensions

163 x 40 x 26 mm (6.4 x 1.6 x 1.0")

Weight

100 g (3.5 oz.)

Solutions for Calibration and Maintenance

New Series of Solutions

To meet the requirements of various applications, new categories of solutions have been created: **HI 50xx series, technical solutions:** they allow for calibration at all units of pH from pH 1.00 to pH 13.00.

HI 60xx series, millesimal solutions: they allow for the correct calibration of pH meters with millesimal readings.

HI 706xx series, cleaning solutions: an indispensable tool when the electrode is used continuously. Produced with the purpose of ensuring correct readings in widely varied areas of application, they guarantee a long life for the electrode and precise measurements.

Ready-to-Use Single-Dose Sachets



Custom-made Solutions

Get the best out of your instruments using single-dose HANNA instruments® calibration and maintenance solutions. A wide range of solutions for pH, conductivity, TDS and cleaning is available in the form of practical 20 mL sachets.

Each sachet holds the right amount of calibration solution, ready for use, sealed and protected against light.

When your instrument is calibrated using these HANNA instruments® sachets, it is like using a newly-opened bottle of solution.

Single-Dose Certified Solutions in Sachets

Solutions in sachets are now also available with a certificate of analysis. Just as in the case of bottled solutions, the certificate shows the date of production, batch number and expiration date.

Combination Kits

To be more practical, HANNA instruments® solutions are also available in combined kits useful for multiparameter instruments or for two-point calibration.

Calibration and Cleaning Solutions for Electrodes and Probes

The use of calibration and cleaning solutions is fundamental for the correct performance of electrodes and for obtaining the most accurate and reproducible readings. Often readings are not correct because the sensors have not been properly handled. Using HANNA instruments® wide range of solutions guarantees a correct cleaning and calibration of electrodes and probes. Our application engineered solutions have been produced with reference instruments calibrated with the highest precision NIST standard.

Ready-to-Use Solutions

Buffer solutions prepared in small batches from capsules, tablets or powders, are called "fresh" because they are prepared at the time of use. They are considered to be, but are not, very precise. The quality of the buffer solutions depends on many factors that intervene during production: the quantity and quality of the chemicals and distilled water that have been used in preparing the batches, the temperature and the instruments used to prepare them. HANNA instruments® buffer solutions are prepared using chemicals that have been checked very carefully, within an aseptic environment and with the highest precision reference instruments.

A Complete Range

The entire range of HANNA instruments® solutions includes:

- pH buffer solutions
- Standard solutions for conductivity, TDS, turbidity, salinity and fluoride calibration
- ORP test and pretreatment solutions
- Electrolyte solutions for refillable electrodes
- General and specific cleaning solutions for electrodes
- Solutions for electrode maintenance
- Solutions for sample preparation

The solutions are available in many sizes to satisfy all different applications, from 20 mL sachets all the way to 3.78 L (1 Gallon). All HANNA instruments® solutions are provided with a label showing the batch number and expiration date, for safety and traceability.

Certified Solutions

For those operators who request it, we provide standard solutions complete with certificate of analysis, prepared against NIST standards, to avoid any possible error in determining the actual pH value. The use of these certified HANNA instruments® solutions adds a further factor of accuracy to your most critical measurements. The certificates show the date of production, batch number, accuracy rating and the expiration date.

Table of Reference Temperatures

All calibration solutions are provided with a label presenting a reference table of the relationship between pH or conductivity values and the temperature. This will save time and, most important, will prevent calibration errors especially during field measurements.

Bottles that Meet FDA Standards

In order for you to be certain of the accuracy of your instruments over time, ask for HANNA instruments® solutions in FDA type bottles (US Food & Drug Administration). These are opaque bottles, so that the value of the solution remains unchanged even when exposed to light.

Material Safety Data Sheets

Material Safety Data Sheets (MSDS) for each of the solutions included in the HANNA instruments® catalog can be found at www.hannainst.com.



Technical pH Solutions for Cleaning and Storing Electrodes

Technical-bottles

pH Value @25°C	Code	Package
1.00	HI 5001	1 x 500 mL
1.68	HI 5016	1 x 500 mL
2.00	HI 5002	1 x 500 mL
2.00	HI 5002-01	1 x 1 L
2.00	HI 5002-36	36 x 500 mL
3.00	HI 5003	1 x 1 L
3.00	HI 5003-36	36 x 500 mL
3.79	HI 5037	1 x 500 mL
4.01	HI 5004	1 x 500 mL
4.01	HI 5004-01	1 x 1 L
4.01	HI 5004-12	12 x 500 mL
4.01	HI 5004-36	36 x 500 mL
4.01	HI 5004-R	1 x 500 mL
4.01	HI 5004-R08	1 x 1 G (3.78 L)
4.01	HI 5004-R36	36 x 500 mL
4.63	HI 5046	1 x 500 mL
4.63	HI 5046-01	1 x 1 L
5.00	HI 5005	1 x 500 mL
5.00	HI 5005-01	1 x 1 L
6.00	HI 5006	1 x 500 mL
6.00	HI 5006-01	1 x 1 L
6.00	HI 5006-36	36 x 500 mL
6.86	HI 5068	1 x 500 mL
7.01	HI 5007	1 x 500 mL
7.01	HI 5007-01	1 x 1 L

pH Value @25°C	Code	Package
7.01	HI 5007-12	12 x 500 mL
7.01	HI 5007-36	36 x 500 mL
7.01	HI 5007-G	1 x 500 mL
7.01	HI 5007-G08	1 x 1 G (3.78 L)
7.01	HI 5007-G36	36 x 500 mL
7.41	HI 5074	1 x 500 mL
7.41	HI 5074-01	1 x 1 L
8.00	HI 5008	1 x 500 mL
8.00	HI 5008-01	1 x 1 L
8.00	HI 5008-36	36 x 500 mL
9.00	HI 5009	1 x 500 mL
9.00	HI 5009-01	1 x 1 L
9.00	HI 5009-36	36 x 500 mL
9.18	HI 5091	1 x 500 mL
10.01	HI 5010	1 x 500 mL
10.01	HI 5010-01	1 x 1 L
10.01	HI 5010-12	12 x 500 mL
10.01	HI 5010-36	36 x 500 mL
10.01	HI 5010-V	1 x 500 mL
10.01	HI 5010-V08	1 x 1 G (3.78 L)
10.01	HI 5010-V36	36 x 500 mL
11.00	HI 5011	1 x 500 mL
12.00	HI 5012	1 x 500 mL
12.45	HI 5124	1 x 500 mL
13.00	HI 5013	1 x 500 mL



Precise Measurements

To obtain precise and valid pH measurements, the pH meter and pH electrode must be calibrated at a minimum of 2 different points, close to the value of the sample to be tested.

HANNA instruments® offers a complete range of pH buffer solutions, that will satisfy all your calibration needs and which have now been extended with two additional lines: the HI 50xx series of technical buffer solutions (shown on these pages,) and the solutions with millesimal resolution, HI 60xx.

Technical Solutions (± 0.01 pH) for Each Point of the pH Scale.

A complete scale of buffer solutions offers a higher degree of accuracy for pH measurements in specific areas of application, such as in monitoring the pH of must and wine.

This new line includes 13 solutions starting from a value of pH 1.00 up to pH 13.00 with an accuracy of ± 0.01 pH, thus covering every point of the pH scale.

These solutions have been prepared for all those applications that require very accurate pH monitoring, and are also available with certificate of analysis prepared by comparison against the NIST standards.

Also available are solution bottles, that are colored according to a given standard calibration value: HI 5004-R (Red), HI 5007-G (Green) and HI 5010-V (Violet)

Easy to Use Single Dose Sachets

For the highest level of reliability of field instrumentation, technical solutions are also provided in convenient single-dose sachets.

Calibration solution sachets are sold in boxes containing 10 or 25 pieces, so that there is always a small amount set aside for daily use.

Technical-sachets

pH Value @25°C	Code	Package
1.00	HI 50001-01	10 x 20 mL
1.00	HI 50001-02	25 x 20 mL
1.68	HI 50016-01	10 x 20 mL
1.68	HI 50016-02	25 x 20 mL
2.00	HI 50002-01	10 x 20 mL
2.00	HI 50002-02	25 x 20 mL
3.00	HI 50003-01	10 x 20 mL
3.00	HI 50003-02	25 x 20 mL
3.79	HI 50037-01	10 x 20 mL
3.79	HI 50037-02	25 x 20 mL
4.01	HI 50004-01	10 x 20 mL
4.01	HI 50004-02	25 x 20 mL
4.63	HI 50046-01	10 x 20 mL
4.63	HI 50046-02	25 x 20 mL
5.00	HI 50005-01	10 x 20 mL
5.00	HI 50005-02	25 x 20 mL
6.00	HI 50006-01	10 x 20 mL
6.00	HI 50006-02	25 x 20 mL
6.86	HI 50068-01	10 x 20 mL
6.86	HI 50068-02	25 x 20 mL

pH Value @25°C	Code	Package
7.01	HI 50007-01	10 x 20 mL
7.01	HI 50007-02	25 x 20 mL
7.41	HI 50074-01	10 x 20 mL
7.41	HI 50074-02	25 x 20 mL
8.00	HI 50008-01	10 x 20 mL
8.00	HI 50008-02	25 x 20 mL
9.00	HI 50009-01	10 x 20 mL
9.00	HI 50009-02	25 x 20 mL
9.18	HI 50091-01	10 x 20 mL
9.18	HI 50091-02	25 x 20 mL
10.01	HI 50010-01	10 x 20 mL
10.01	HI 50010-02	25 x 20 mL
11.00	HI 50011-01	10 x 20 mL
11.00	HI 50011-02	25 x 20 mL
12.00	HI 50012-01	10 x 20 mL
12.00	HI 50012-02	25 x 20 mL
12.45	HI 50124-01	10 x 20 mL
12.45	HI 50124-02	25 x 20 mL
13.00	HI 50013-01	10 x 20 mL
13.00	HI 50013-02	25 x 20 mL

Millesimal pH Solutions

Millesimal Calibration Solutions

The new line of buffers with millesimal accuracy ($\pm 0.002\%$ pH), HI 60xx, has been prepared to meet the increasing need for extreme accuracy in pH measurements.

Each bottle of this new series is provided with a certificate of analysis, prepared by comparison with NIST standards.

Color Ranges



The colors on the labels correspond to a given standard pH value. this makes it easy and safe to identify the buffers to be used.

Millesimal - bottles

pH Value @25°C	Code	Package
1.000	HI 6001	1 x 500 mL
1.000	HI 6001-01	1 x 1 L
1.679	HI 6016	1 x 500 mL
1.679	HI 6016-01	1 x 1 L
2.000	HI 6002	1 x 500 mL
2.000	HI 6002-01	1 x 1 L
3.000	HI 6003	1 x 500 mL
3.000	HI 6003-01	1 x 1 L
3.788	HI 6037	1 x 500 mL
3.788	HI 6037-01	1 x 1 L
4.010	HI 6004	1 x 500 mL
4.010	HI 6004-01	1 x 1 L
4.630	HI 6046	1 x 500 mL
4.630	HI 6046-01	1 x 1 L
5.000	HI 6005	1 x 500 mL
5.000	HI 6005-01	1 x 1 L
6.000	HI 6006	1 x 500 mL
6.000	HI 6006-01	1 x 1 L
6.862	HI 6068	1 x 500 mL
6.862	HI 6068-01	1 x 1 L
7.010	HI 6007	1 x 500 mL
7.010	HI 6007-01	1 x 1 L
7.413	HI 6074	1 x 500 mL
7.413	HI 6074-01	1 x 1 L
8.000	HI 6008	1 x 500 mL
8.000	HI 6008-01	1 x 1 L
9.000	HI 6009	1 x 500 mL
9.000	HI 6009-01	1 x 1 L
9.177	HI 6091	1 x 500 mL
9.177	HI 6091-01	1 x 1 L
10.010	HI 6010	1 x 500 mL
10.010	HI 6010-01	1 x 1 L
11.000	HI 6011	1 x 500 mL
11.000	HI 6011-01	1 x 1 L
12.000	HI 6012	1 x 500 mL
12.000	HI 6012-01	1 x 1 L
12.450	HI 6124	1 x 500 mL
12.450	HI 6124-01	1 x 1 L
13.000	HI 6013	1 x 500 mL
13.000	HI 6013-01	1 x 1 L

Millesimal - sachets

pH Value @25°C	Code	Package
1.000	HI 60001-01	10 x 20 mL
1.000	HI 60001-02	25 x 20 mL
1.679	HI 60016-01	10 x 20 mL
1.679	HI 60016-02	25 x 20 mL
2.000	HI 60002-01	10 x 20 mL
2.000	HI 60002-02	25 x 20 mL
3.000	HI 60003-01	10 x 20 mL
3.000	HI 60003-02	25 x 20 mL
3.788	HI 60037-01	10 x 20 mL
3.788	HI 60037-02	25 x 20 mL
4.010	HI 60004-01	10 x 20 mL
4.010	HI 60004-02	25 x 20 mL
4.630	HI 60046-01	10 x 20 mL
4.630	HI 60046-02	25 x 20 mL
5.000	HI 60005-01	10 x 20 mL
5.000	HI 60005-02	25 x 20 mL
6.000	HI 60006-01	10 x 20 mL
6.000	HI 60006-02	25 x 20 mL
6.862	HI 60068-01	10 x 20 mL
6.862	HI 60068-02	25 x 20 mL
7.010	HI 60007-01	10 x 20 mL
7.010	HI 60007-02	25 x 20 mL
7.413	HI 60074-01	10 x 20 mL
7.413	HI 60074-02	25 x 20 mL
8.000	HI 60008-01	10 x 20 mL
8.000	HI 60008-02	25 x 20 mL
9.000	HI 60009-01	10 x 20 mL
9.000	HI 60009-02	25 x 20 mL
9.177	HI 60091-01	10 x 20 mL
9.177	HI 60091-02	25 x 20 mL
10.010	HI 60010-01	10 x 20 mL
10.010	HI 60010-02	25 x 20 mL
11.000	HI 60011-01	10 x 20 mL
11.000	HI 60011-02	25 x 20 mL
12.000	HI 60012-01	10 x 20 mL
12.000	HI 60012-02	25 x 20 mL
12.450	HI 60124-01	10 x 20 mL
12.450	HI 60124-02	25 x 20 mL
13.000	HI 60013-01	10 x 20 mL
13.000	HI 60013-02	25 x 20 mL



pH Solutions

pH STANDARD SOLUTIONS*

Part No.	pH Value at 25°C	Size	Quantity Per Package	FDA Approved	Factory Analysis Certificate
HI 7001L	1.68	500 mL	1		
HI 7001M	1.68	230 mL	1		
HI 70004C	4.01	20 mL	25		•
HI 70004P	4.01	20 mL	25		
HI 7004P/5	4.01	20 mL	500		
HI 77400C	4.01 & 7.01	20 mL	10 (5 ea.)		•
HI 77400P	4.01 & 7.01	20 mL	10 (5 ea.)		
HI 7004M	4.01	230 mL	1		
HI 7004L	4.01	500 mL	1		
HI 7004L/C	4.01	500 mL	1		•
HI 8004L	4.01	500 mL	1	•	
HI 8004L/C	4.01	500 mL	1	•	•
HI 7004/1L	4.01	1 Liter	1		
HI 8004/1L	4.01	1 Liter	1	•	
HI 7004/1G	4.01	1 US Gallon	1		
HI 70006C	6.86	20 mL	25		•
HI 70006P	6.86	20 mL	25		
HI 7006M	6.86	230 mL	1		
HI 7006L	6.86	500 mL	1		
HI 7006L/C	6.86	500 mL	1		•
HI 8006L	6.86	500 mL	1	•	
HI 8006L/C	6.86	500 mL	1	•	•
HI 7006/1L	6.86	1 Liter	1		
HI 8006/1L	6.86	1 Liter	1	•	
HI 7006/1G	6.86	1 US Gallon	1		
HI 70007C	7.01	20 mL	25		•
HI 70007P	7.01	20 mL	25		
HI 7007P/5	7.01	20 mL	500		
HI 77700C	7.01	20 mL	10		•
HI 77700P	7.01	20 mL	10		
HI 7007M	7.01	230 mL	1		
HI 7007L	7.01	500 mL	1		
HI 7007L/C	7.01	500 mL	1		•
HI 8007L	7.01	500 mL	1	•	
HI 8007L/C	7.01	500 mL	1	•	•
HI 7007/1L	7.01	1 Liter	1		
HI 8007/1L	7.01	1 Liter	1	•	
HI 7007/1G	7.01	1 US Gallon	1		
HI 70009C	9.18	20 mL	25		•
HI 70009P	9.18	20 mL	25		
HI 7009M	9.18	230 mL	1		
HI 7009L	9.18	500 mL	1		
HI 7009L/C	9.18	500 mL	1		•
HI 8009L	9.18	500 mL	1	•	
HI 8009L/C	9.18	500 mL	1	•	•
HI 7009/1L	9.18	1 Liter	1		
HI 8009/1L	9.18	1 Liter	1	•	
HI 7009/1G	9.18	1 US Gallon	1		
HI 70010C	10.01	20 mL	25		•
HI 70010P	10.01	20 mL	25		
HI 70010P/5	10.01	20 mL	500		
HI 770710C	10.01 & 7.01	20 mL	10 (5 ea.)		•
HI 770710P	10.01 & 7.01	20 mL	10 (5 ea.)		
HI 7010M	10.01	230 mL	1		
HI 7010L	10.01	500 mL	1		
HI 7010L/C	10.01	500 mL	1		•
HI 8010L	10.01	500 mL	1	•	
HI 8010L/C	10.01	500 mL	1	•	•
HI 7010/1L	10.01	1 Liter	1		
HI 8010/1L	10.01	1 Liter	1	•	
HI 7010/1G	10.01	1 US Gallon	1		

*20mL sizes are single use sachets; all other sizes are packaged in bottles.



20 mL single dose sachets



pH COMBINATION KITS

Code	Solutions (pH Value @25°C)	Bottle
HI 54710	pH 4.01, pH 7.01, pH 10.01	3 x 500 mL
HI 54710-10	pH 4.01, pH 7.01, pH 10.01	4 x 500 mL
HI 54710-11	pH 4.01, pH 7.01, pH 10.01	5 x 500 mL
HI 54710-12	pH 4.01, pH 7.01, pH 10.01	6 x 500 mL
HI 54710-13	pH 4.01, pH 7.01, pH 10.01	6 x 500 mL

Conductivity Solutions

Conductivity Solutions

The calibration of the instrument/sensor measuring system will ensure correct and reproducible results.

The use of standard calibration solutions is therefore fundamental for the highest accuracy of the measuring system.

The HANNA instruments® wide range of conductivity calibration solutions has been produced to ensure the maximum accuracy for conductivity meters and probes.

Guaranteed Accuracy

Your conductivity meter can be calibrated in a few minutes right in your laboratory or in the field.

HANNA instruments® offers a wide range of conductivity solutions in different forms and values. Each label shows the production batch number, expiration date and conductivity/ temperature correlation table.

Certified Solutions and FDA Compliant Bottles

For those users that require maximum accuracy, EC (conductivity) solutions are available in sachets with certificates of analysis, and in opaque bottles that meet FDA requirements.

High Accuracy Solutions

HI 60xx high accuracy solutions are also available.



CONDUCTIVITY BOTTLES

Code	EC Value @25°C	Size	Package	FDA Bottle	Certificate of Analysis
HI 6031	1413 µS/cm	500 mL	1 bottle		•
HI 6033	84 µS/cm	500 mL	1 bottle		•
HI 7030L	12880 µS/cm	500 mL	1 bottle		
HI 7030M	12880 µS/cm	230 mL	1 bottle		
HI 7030/1G	12880 µS/cm	1 Gallon (3.78 L)	1 bottle		
HI 7031L	1413 µS/cm	500 mL	1 bottle		
HI 7031L/C	1413 µS/cm	500 mL	1 bottle		•
HI 7031M	1413 µS/cm	230 mL	1 bottle		
HI 7031/1G	1413 µS/cm	1 Gallon (3.78 L)	1 bottle		
HI 7033L	84 µS/cm	500 mL	1 bottle		
HI 7033M	84 µS/cm	230 mL	1 bottle		
HI 7034L	80000 µS/cm	500 mL	1 bottle		
HI 7034M	80000 µS/cm	230 mL	1 bottle		
HI 7035L	111800 µS/cm	500 mL	1 bottle		
HI 7035M	111800 µS/cm	230 mL	1 bottle		
HI 7039L	5000 µS/cm	500 mL	1 bottle		
HI 7039M	5000 µS/cm	230 mL	1 bottle		
HI 8030L	12880 µS/cm	500 mL	1 bottle	•	
HI 8031L	1413 µS/cm	500 mL	1 bottle	•	
HI 8033L	84 µS/cm	500 mL	1 bottle	•	
HI 8034L	80000 µS/cm	500 mL	1 bottle	•	
HI 8035L	111800 µS/cm	500 mL	1 bottle	•	
HI 8039L	5000 µS/cm	500 mL	1 bottle	•	

CONDUCTIVITY SACHETS

Code	EC Value @25°C	Size	Package	Certificate of Analysis
HI 70030C	12880 µS/cm	20 mL	25 sachets	•
HI 70030P	12880 µS/cm	20 mL	25 sachets	
HI 70031C	1413 µS/cm	20 mL	25 sachets	•
HI 70031P	1413 µS/cm	20 mL	25 sachets	
HI 70033C	84 µS/cm	20 mL	25 sachets	•
HI 70033P	84 µS/cm	20 mL	25 sachets	
HI 70039C	5000 µS/cm	20 mL	25 sachets	•
HI 70039P	5000 µS/cm	20 mL	25 sachets	
HI 77100C	1413 µS/cm & pH 7.01	20 mL	20 sachets (10 each)	•
HI 77100P	1413 µS/cm & pH 7.01	20 mL	20 sachets (10 each)	

TDS Solutions



TDS Solutions

HANNA instruments® is one of the few producers to offer calibration solutions for lab and field applications with packages from 20 to 500 mL. Our packaging has been designed to keep air and light from damaging the calibration solutions.

Material Safety Data Sheets

The material safety data sheets for all the HANNA instruments® solutions in this catalog are available on-line (visit www.hannainst.com) or upon request.

Expiration Date

The label of all HANNA instruments® calibration solutions reports the production batch number and the expiration date.

HI 6032 Standard Solution

- High Precision Standard Solution at 1382 ppm
- Certificate of Analysis

TDS BOTTLES

Code	TDS Value @25°C	Size	Package	Certificate of Analysis
HI 6032	1382 ppm (mg/L)	500 mL	1 bottle	•
HI 7032L	1382 ppm (mg/L)	500 mL	1 bottle	
HI 7032M	1382 ppm (mg/L)	230 mL	1 bottle	
HI 7036L	12.41 ppt (g/L)	500 mL	1 bottle	
HI 7036M	12.41 ppt (g/L)	230 mL	1 bottle	
HI 70442L*	1500 ppm (mg/L)	500 mL	1 bottle	
HI 70442M*	1500 ppm (mg/L)	230 mL	1 bottle	

TDS SACHETS

Code	TDS Value @25°C	Size	Package	Certificate of Analysis
HI 70032C	1382 ppm (mg/L)	20 mL	25 sachets	•
HI 70032P	1382 ppm (mg/L)	20 mL	25 sachets	
HI 70032P/5	1382 ppm (mg/L)	20 mL	500 sachets	
HI 70038C	6.44 ppt (g/L)	20 mL	25 sachets	•
HI 70038P	6.44 ppt (g/L)	20 mL	25 sachets	
HI 70080C	800 ppm (mg/L)	20 mL	25 sachets	•
HI 70080P	800 ppm (mg/L)	20 mL	25 sachets	
HI 70442C*	1500 ppm (mg/L)	20 mL	25 sachets	•
HI 70442P*	1500 ppm (mg/L)	20 mL	25 sachets	
HI 77200C*	1500 ppm (mg/L) & pH 7.01	20 mL	20 sachets (10 each)	•
HI 77200P*	1500 ppm (mg/L) & pH 7.01	20 mL	20 sachets (10 each)	
HI 77300C	1382 ppm (mg/L) & pH 7.01	20 mL	20 sachets (10 each)	•
HI 77300P	1382 ppm (mg/L) & pH 7.01	20 mL	20 sachets (10 each)	

* TDS Conversion Factor 4-4-2: 0.65 ppm = 1 µS/cm (approximately).

ORP, Cleaning, Electrolyte and Storage Solutions

ORP Standard Solutions

ORP standard solutions allow you to test the precision of ORP electrodes. For example, by immersing the electrode in HI 7020 solution, you should read within the 200 to 275 mV range (@20°C/68°F).

If the reading is outside the indicated interval, clean and condition your ORP electrode in HANNA instruments® pretreatment solution.

Use HI 7092 for oxidizing or HI 7091 for reducing pretreatment.

Refill Electrolyte Solutions

The electrolyte level in refillable electrodes should be checked before performing any measurement.

If the level is low, refill with the proper electrolyte solution to ensure the correct electrode performance. This simple maintenance helps guarantee the efficiency and precision of your refillable electrodes.

Electrolyte solutions are also available in FDA compliant bottles.

General and Specific Cleaning

Clean the liquid junction of your electrodes once a day or at least once a week to prevent clogging and to maintain accuracy. Immerse the electrode in the proper cleaning solution for about 5 minutes.

HANNA instruments® offers a wide range of cleaning solutions, for general purpose and specific applications to eliminate all kind of dirt or deposit from the electrode, and thus ensure correct measurements.

The cleaning solutions are available in 20 mL sachets, or 230 and 500 mL bottles, both standard and FDA types.

Storage Solutions

To minimize clogging and ensure fast response time, keep always moist the glass bulb and the junction of your pH electrode.

Store the electrode with a few drops of HI 70300 storage or pH 7 buffer solution in the protective cap.

ORP TEST AND PRETREATMENT SOLUTIONS

Code	Description	Bottle
HI 7020L	ORP Test Solution at 200/275 mV (@20°C)	500 mL
HI 7020M	ORP Test Solution at 200/275 mV (@20°C)	230 mL
HI 7021L	ORP Test Solution at 240 mV (@20°C)	500 mL
HI 7021M	ORP Test Solution at 240 mV (@20°C)	230 mL
HI 7022L	ORP Test Solution at 470 mV (@20°C)	500 mL
HI 7022M	ORP Test Solution at 470 mV (@20°C)	230 mL
HI 7091L	Reducing Pretreatment Solution	500 mL
HI 7091M	Reducing Pretreatment Solution	230 mL
HI 7092L	Oxidizing Pretreatment Solution	500 mL
HI 7092M	Oxidizing Pretreatment Solution	230 mL

ELECTRODE REFILLING SOLUTIONS

Code	Description	Package
HI 7071	Electrolyte Solution, 3.5M KCl + AgCl	4 x 30 mL bottle
HI 7071L	Electrolyte Solution, 3.5M KCl + AgCl	500 mL bottle
HI 7072	Electrolyte Solution, 1M KNO ₃	4 x 30 mL bottle
HI 7072L	Electrolyte Solution, 1M KNO ₃	500 mL bottle
HI 7082	Electrolyte Solution, 3.5M KCl	4 x 30 mL bottle
HI 8071	Electrolyte Solution, 3.5M KCl + AgCl	4 x 30 mL FDA bottle
HI 8072	Electrolyte Solution, 1M KNO ₃	4 x 30 mL FDA bottle
HI 8082	Electrolyte Solution, 3.5M KCl	4 x 30 mL FDA bottle
HI 8093	Electrolyte Solution, 1M KCl + AgCl	4 x 30 mL FDA bottle

ELECTRODE STORAGE SOLUTIONS

Code	Description	Bottle
HI 70300L	Electrode Storage Solution	500 mL
HI 70300M	Electrode Storage Solution	230 mL
HI 80300L	Electrode Storage Solution	500 mL (FDA)
HI 80300M	Electrode Storage Solution	230 mL (FDA)

CLEANING SOLUTIONS FOR GENERAL USE

Code	Application	Package
HI 70000P	Rinsing	25 x 20 mL sachet
HI 7061L	General Purpose	500 mL bottle
HI 7061M	General Purpose	230 mL bottle

CLEANING SOLUTIONS FOR SPECIFIC PURPOSES

Code	Description	Package
HI 70670L	Cleaning Solution for Salt Deposits (Industrial Processes)	500 mL
HI 70670M	Cleaning Solution for Salt Deposits (Industrial Processes)	230 mL
HI 700670P	Cleaning Solution for Salt Deposits (Industrial Processes)	25 x 20 mL sachet
HI 70671L	Cleaning and Disinfection Solution for Algae, Fungi and Bacteria (Industrial Processes)	500 mL
HI 70671M	Cleaning and Disinfection Solution for Algae, Fungi and Bacteria (Industrial Processes)	230 mL
HI 700671P	Cleaning and Disinfection Solution for Algae, Fungi and Bacteria (Industrial Processes)	25 x 20 mL sachet
HI 70680L	Cleaning Solution for Cellulose Deposits	500 mL
HI 70680M	Cleaning Solution for Cellulose Deposits	230 mL
HI 70681L	Cleaning Solution for Ink Stains	500 mL
HI 70681M	Cleaning Solution for Ink Stains	230 mL
HI 700680P	Cleaning Solution for Ink Stains	25 x 20 mL sachet

D.O., Fluoride, Turbidity and Salinity Solutions



Oxygen Electrolyte Solution

It is crucial to the performance of the D.O. probe to keep the sensor active with regular maintenance. For this purpose, Hanna has developed HI 7041S electrolyte solution to refill the membrane cap.

DISSOLVED OXYGEN SOLUTIONS

Code	Description
HI 7040M	0 Oxygen Solution (230 mL)
HI 7040L	0 Oxygen Solution (500 mL)
HI 7041S	Electrolyte Solution for Polarographic DO Probes (30 mL)

FLUORIDE STANDARD SOLUTIONS

These standard solutions allow you to calibrate all instruments, that measure fluoride using ion-specific sensors.

The most common applications include the analysis of water from springs close to volcanic rocks, or the cosmetics, pharmaceutical, glass and steel industries.

Code	Description	Bottle
HI 7023/1L	TISAB Solution	1 L
HI 7023L	TISAB Solution	500 mL
HI 70701/1L	Standard Solution at 1 g/L F ⁻	1 L
HI 70701L	Standard Solution at 1 g/L F ⁻	500 mL
HI 70701M	Standard Solution at 1 g/L F ⁻	230 mL
HI 70702/1L	Standard Solution at 10 mg/L F ⁻	1 L
HI 70702L	Standard Solution at 10 mg/L F ⁻	500 mL
HI 70702M	Standard Solution at 10 mg/L F ⁻	230 mL
HI 70703/1L	Standard Solution at 100 mg/L F ⁻	1 L
HI 70703L	Standard Solution at 100 mg/L F ⁻	500 mL
HI 70703M	Standard Solution at 100 mg/L F ⁻	230 mL

TURBIDITY STANDARD SOLUTIONS

The HANNA instruments® turbidity calibration solutions are produced according to the AMCO AEPA-1 standards, at 0, 10, 20 and 500 FTU.

They are preferred to the formazine based standards, as they are non-toxic, stable, reusable and long-lasting.

Code	Description	Bottle
HI 93102-0	AMCO-AEPA-1 Calibration Solution at 0 NTU	30 mL
HI 93102-20	AMCO-AEPA-1 Calibration Solution at 20 NTU	30 mL
HI 93124-0	Standard Solution at 0 EBC	30 mL
HI 93124-1	Standard Solution at 2.5 EBC	30 mL
HI 93124-2	Standard Solution at 125 EBC	30 mL
HI 93703-0	AMCO-AEPA-1 Calibration Solution at 0 FTU	30 mL
HI 93703-05	AMCO-AEPA-1 Calibration Solution at 500 FTU	30 mL
HI 93703-10	AMCO-AEPA-1 Calibration Solution at 10 FTU	30 mL

SALINITY STANDARD SOLUTIONS

The sodium and sodium chloride standard solutions allow you to perform an accurate calibration of the pocket sized (pNa and SALINTEST), portable (for example HI 931101) and bench salinity meters.

These solutions are available in 230 or 500 mL bottles, and also in opaque bottles that meet the FDA (Food & Drug Administration) specifications.

SODIUM (Na⁺) STANDARD SOLUTIONS

Code	Description	Bottle
HI 7080L	Standard Solution at 2.3 g/L Na ⁺	500 mL
HI 7080M	Standard Solution at 2.3 g/L Na ⁺	230 mL
HI 7086L	Standard Solution at 23 g/L Na ⁺	500 mL
HI 7086M	Standard Solution at 23 g/L Na ⁺	230 mL
HI 7087L	Standard Solution at 0.23 g/L Na ⁺	500 mL
HI 7087M	Standard Solution at 0.23 g/L Na ⁺	230 mL
HI 8080L	Standard Solution at 2.3 g/L Na ⁺	500 mL (FDA)
HI 8080M	Standard Solution at 2.3 g/L Na ⁺	230 mL (FDA)
HI 8086L	Standard Solution at 23 g/L Na ⁺	500 mL (FDA)
HI 8086M	Standard Solution at 23 g/L Na ⁺	230 mL (FDA)
HI 8087L	Standard Solution at 0.23 g/L Na ⁺	500 mL (FDA)
HI 8087M	Standard Solution at 0.23 g/L Na ⁺	230 mL (FDA)

SODIUM CHLORIDE (NaCl) STANDARD SOLUTIONS

Code	Description	Bottle
HI 7037L	Calibration solution for % Readings (100% NaCl)	500 mL
HI 7037M	Calibration solution for % Readings (100% NaCl)	230 mL
HI 7081L	Standard Solution at 30 g/L NaCl	500 mL
HI 7081M	Standard Solution at 30 g/L NaCl	230 mL
HI 7083L	Standard Solution at 3.0 g/L NaCl	500 mL
HI 7083M	Standard Solution at 3.0 g/L NaCl	230 mL
HI 7084L	Standard Solution at 58.4 g/L NaCl	500 mL
HI 7084M	Standard Solution at 58.4 g/L NaCl	230 mL
HI 7085L	Standard Solution at 0.3 g/L NaCl	500 mL
HI 7085M	Standard Solution at 0.3 g/L NaCl	230 mL
HI 7088L	Standard Solution at 5.84 g/L NaCl	500 mL
HI 7088M	Standard Solution at 5.84 g/L NaCl	230 mL
HI 7089L	Standard Solution at 125 g/L NaCl	500 mL
HI 7089M	Standard Solution at 125 g/L NaCl	230 mL
HI 7090L	ISA Solution	500 mL
HI 7090M	ISA Solution	230 mL
HI 8084L	Standard Solution at 58.4 g/L NaCl	500 mL (FDA)
HI 8084M	Standard Solution at 58.4 g/L NaCl	230 mL (FDA)
HI 8088L	Standard Solution at 5.84 g/L NaCl	500 mL (FDA)
HI 8088M	Standard Solution at 5.84 g/L NaCl	230 mL (FDA)
HI 8089L	Standard Solution at 125 g/L NaCl	500 mL (FDA)
HI 8089M	Standard Solution at 125 g/L NaCl	230 mL (FDA)
HI 8095L	Standard Solution at 146 g/L NaCl	500 mL (FDA)
HI 8095M	Standard Solution at 146 g/L NaCl	230 mL (FDA)

Symbol Guide

Warranty and Service

Guide to Symbols



pH Condition
Verify the pH/ORP electrode condition



Check Electrode
Verify the pH/ORP electrode status



Validation
Verification and calibration system for photometers



Custom Buffer
Enter custom buffers for pH calibration



2 Points
Calibration can be performed at 1 or 2 points



3 Points
Calibration can be performed at 1 to 3 points



5 Points
Calibration can be performed at 1 to 5 points



Hold
Freeze reading on the display



Beep
Acoustic signal



Backlight
Backlit display



Replaceable
Tester with replaceable probe



Upgrade
Upgraded product



Transmission GSM
Remote connection through GSM network



Battery
Remaining battery life indication



BEPS (Battery Error Prevention System)
Automatically turns the meter off to avoid erroneous readings due to low battery level

Limited Warranty

Hanna Instruments products are manufactured in our ISO 9001 facilities, meeting the highest quality standards in the industry. Hanna's high standards also apply should a product be returned due to defects in material or workmanship. Our extensive warranty extends up to three years on some products.

Limitations: Warranted products may be returned for repair or replacement only at the discretion of Hanna Instruments. In some circumstances, remedy may constitute refund for the price paid for the product.

The warranty period commences from the original date of sale to the user or a maximum of 18 months from factory ship date. Warranty is valid only when the product is used under normal conditions and in accordance with operating limitations and prescribed maintenance procedures. The express warranty stated previously is the only express warranty given by Hanna to the end-user buyer. Hanna expressly disclaims any warranties implied by law, including but not limited to warranty of merchantability of fitness for a particular purpose. Hanna shall not be liable for any individual or consequential damages of any kind for breach of any warranty, negligence, on the basis of strict liability or otherwise. Hanna's warranty periods are:

5 years	HI 221 & HI 223
3 years	HI 901 & HI 902
3 years	HI 120, HI 110, HI 250 & pH 300 series, HI 4200 series, HI 255 Bench Top Meters
2 years	Portable Meters
2 years	Bench Meters not mentioned above
2 years	Printing Meters
2 years	Stirrers & Industrial Meters
1 year	Dosing Pumps
1 year	Waterproof Testers
6 months	Testers & Pocket-size Thermometers
6 months	Electrodes & Probes

Instrument Service

Warranty and non-warranty service, replacement, recalibration and repairs are performed by factory trained service technicians at Hanna's Woonsocket, RI Technical Service Center. All items must have a Return Goods Authorization (RGA) number that can be obtained by contacting the Hanna Technical Service Department. The RGA number should be clearly marked on the outside of the box and the unit shipped prepaid and insured. Any product not bearing an RGA number will be refused. All products returned for warranty repair or replacement MUST be preceded or accompanied with proof of purchase, such as the original invoice or packing slip. Under special circumstances it may be deemed necessary by Hanna Instruments to issue a Return In Advance (RIA). In such cases, the defective materials must be returned to Hanna within 30 days. Materials not returned within 30 days become chargeable. Materials must be packed properly to avoid damage during transport, which would render the warranty null and void. The sender is responsible for expediting any damage claims placed against the carrier.

A flat minimum service charge of \$60.00 (per hour) applies to non-warranty repairs or recalibration. Any materials returned for repair which are considered non-warranty may be serviced at the previously stated hourly cost (excluding parts) following subsequent notification and approval of such.

Product Return and Exchange

Returning Merchandise

Should an instance occur when a product may need to be returned for exchange or credit, or should a discrepancy occur in a packing slip, Hanna Instruments must be contacted to obtain a Return Goods Authorization Number (RGA). Please follow these steps:

1. Within 30 days of receipt of merchandise call Hanna's Technical Service Department to obtain a Return Goods Authorization Number.
2. Hanna will issue a Return Goods Authorization Number.
3. The number must be clearly marked on the outside of the package being returned. Shipments not bearing a Return Goods Authorization Number will be refused.
4. Credit returns may be subject to a 25% restocking fee.

Terms and Conditions

Return shipments must meet the following requirements to be accepted for credit:

1. Products must be returned in the original packaging with labeling not defaced. All items returned will be inspected for credit worthiness. Credit will only be issued for product returned in like-new condition. No credit will be issued for product, which is not received in like-new condition.
2. All freight charges are the responsibility of the customer.
3. All chemicals and reagents being returned must be packaged in accordance with U.S. Department of Transportation regulation. Only unopened chemicals and reagents may be returned.