HI5221

Research Grade Meter

pH/ORP and Temperature

The HI5221 is an advanced research grade benchtop pH/mV meter that is completely customizable with a large color LCD, capacitive touch keys, and USB port for computer connectivity.

The HI5221 features a universal BNC connection for use with the expansive line of pH and ORP electrodes that Hanna Instruments offers. The meter is supplied with the HI1131B glass body, double junction, combination pH electrode that operates over a wide temperature range from 0 to 100°C. All readings are automatically compensated for temperature variations with the separate HI7662-T temperature probe that is included.

The HI5221 can be calibrated up to five points with a choice of eight pre-programmed buffers or five custom buffers. The HI5221 features Hanna's exclusive CAL Check™ to alert the user of potential problems during the pH calibration process. Indicators displayed during calibration include "Electrode Dirty/Broken" and "Buffer Contaminated." The overall probe condition based on the offset and slope characteristic of the electrode is displayed as a percentage after calibration is complete. The calibration data including date, time, buffers used, offset and slope can be accessed at any time along with the current measurement by selecting the Good Laboratory Practice (GLP) display option.

Three selectable logging modes are available: automatic, manual and AutoHold logging. Up to 100,000 data points can be recorded in 100 lots with 50,000 records max/lot and exported to a computer for data review and storage.

Customizable User Interface

The user interface of the HI5221 allows the user to show measurements in various modes: basic measurement with or without GLP information, real-time graphing, and logging data. Calibration stability criteria can be adjusted from fast, moderate, and accurate. Programmable alarm limits can be set to inside or outside allowable limits.

Color Graphic LCD

The HI5221 features a color graphic LCD with on-screen help, graphic, and custom color configurations. The display allows for real-time graphing and the use of virtual keys provide for an intuitive user interface.

Capacitive Touch

The HI5221 features sensitive capacitive touch buttons for accurate keystrokes when navigating menus and screens. There are four dedicated keys that are used for routine operations including calibration and switching measurement modes and four virtual keys that change based upon use. The capacitive touch technology ensures the buttons never get clogged with sample residue.

Choice of Calibration

Automatic buffer recognition, semiautomatic, and direct manual entry pH calibration options are available for calibrating up to five points, from a selection of eight standard buffers and up to five custom buffers.

GLP Data

HI5221 includes a GLP feature that allows users to view calibration data and calibration expiration information at the touch of a key. Calibration data include date, time, buffers /standards used for calibration and slope characteristics. The offset is also displayed for pH electrodes.

CAL Check™

CAL Check™ alerts users to potential problems during the calibration of the pH electrode. Indicators include "Electrode Dirty/Broken," "Buffer Contaminated," electrode response time and the overall probe condition as a percentage that is based on the offset and slope characteristics.

Data Logging

Three selectable logging modes are available on the HI5221: automatic, manual, and AutoHold logging. Automatic and manual logs up to 100 lots with 50,000 records max/lot, with up to 100,000 total data points. Automatic logging features the option to save data according to sampling period and interval.

Data Transfer

Data can be transferred to a PC with USB cable and HI92000 software (both sold separately).

Contextual Help

Contextual help is always available through a dedicated "HELP" key. Clear tutorial messages and directions are available on-screen to quickly and easily guide users through setup and calibration. The help information displayed is relative to the setting/option being viewed.

Specifications		HI5221
pH	Range	-2.0 to 20.0 pH; -2.00 to 20.00; -2.000 to 20.000 pH
	Resolution	0.1 pH; 0.01 pH; 0.001 pH
	Accuracy	±0.1 pH; ±0.01 pH; ±0.002 pH ±1 LSD
	Calibration	automatic, up to five point calibration, eight standard buffers available (1.68, 3.00, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45), and five custom buffers
	Temperature Compensation	automatic or manual from -20.0 to 120.0°C/-4.0 to 248.0°/253.15 to 393.15K
mV	Range	±2000 mV
	Resolution	0.1 mV
	Accuracy	±0.2 mV ±1 LSD
	Relative mV Offset Range	±2000 mV
Temperature*	Range	-20.0 to 120°C; -4.0 to 248.0°F; 253.15 to 393.15K
	Resolution	0.1°C; 0.1°F; 0.1K
	Accuracy	±0.2°C; ±0.4°F; ±0.2K
Additional Specifications	pH Electrode	HI1131B glass body pH electrode with BNC connector and 1 m (3.3') cable (included)
	Temperature Probe	HI7662-T stainless steel temperature probe with 1 m (3.3') cable (included)
	Input Channel(s)	1 pH/ORP
	GLP	calibration points, calibration time stamp, probe offset, slope, date, time and buffers/standards used
	Logging	**record :** 100,000 data point storage/channel, 100 lots with 50,000 records/lot; **interval:** fourteen presets selectable between 1 second and max log time of 180 minutes; **type:** automatic, manual, AutoHold
	Display	color graphic LCD 240x340 pixels
	PC Connection	USB
	Power Supply	12 VDC adapter (included)
	Environment	0 to 50°C (32 to 122°F; 273 to 323K) RH max 95% non-condensing
	Dimensions	160 x 231 x 94 mm (6.3 x 9.1 x 3.7")
	Weight	1.2 kg (2.64 lbs.)
Ordering Information		**HI5221-01** (115V) and **HI5221-02** (230V) are supplied with HI1131B pH electrode, HI7662-T temperature probe, pH 4.01 buffer solution sachet (2), pH 7.01 buffer solution sachet (2), HI700601 electrode cleaning solution sachet (2), HI7082 3.5M KCl electrolyte solution (30 mL), HI76404W electrode holder, 12 VDC adapter, capillary dropper pipette, quality certificate, quick start guide and instruction manual.

(*) Reduced to actual probe limits

HI3220

pH Benchtop Meters

pH/mV and Temperature

- CAL Check™
  - Alerts users of calibration status
- GLP features
  - Meets Good Laboratory Practices
- Logging
  - Stability, interval and log-on-demand
- Connectivity
  - PC connectivity via opto-isolatedUSB

Up to 4 Parameters, Single and Dual Channel

Hanna's HI3220 is a professional benchtop meter with a graphic LCD designed to provide accurate laboratory results. The HI3220 is equipped with one input channel.

User-friendly features

HI3220 features an interactive user support interface that assists you before, during and after measurement. On-screen tutorials guide users through set-up, calibration and measurement while context sensitive help on any screen is available at the push of a button. The help screen includes language specific assistance for menu parameters, calibration, logging, contact and accessory information for your instrument.

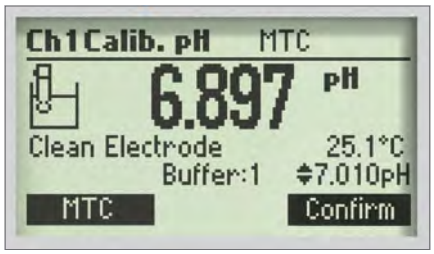
CAL Check™

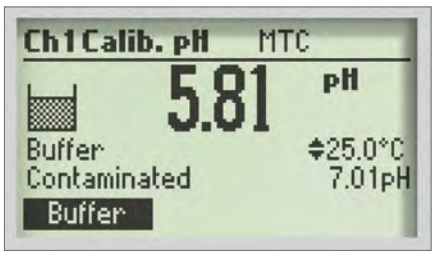
This instrument features Hanna's exclusive CAL Check™, a diagnostics system that ensures accurate pH readings every time. By alerting users of potential problems during the calibration process, the CAL Check™ system eliminates erroneous readings due to dirty or faulty pH electrodes or contaminated pH buffer solutions. Throughout the calibration process, users are guided step-by-step by the on-screen tutorial. After calibration, the probe condition is evaluated and an indicator is displayed informing the user of the overall pH electrode status.

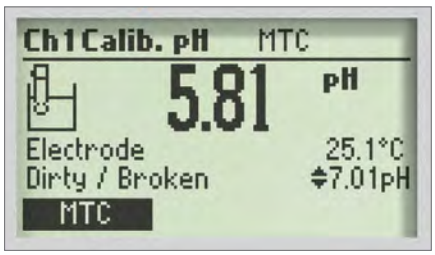
Calibration

HI3220 features up to five point pH calibration with a choice of five custom buffers and seven standard buffers.

CAL Check™ Features







- Calibration
  - pH calibration features detailed CAL Check™ messages. Users are guided through the calibration procedure with step-by-step on-screen instructions.

Specifications		HI3220
pH	Range	-2.0 to 20.0 pH; -2.00 to 20.00 pH; -2.000 to 20.000 pH
	Resolution	0.1 pH; 0.01 pH; 0.001 pH
	Accuracy	±0.01 pH; ±0.002 pH
	Calibration	up to five-point calibration, seven standard buffers available (1.68, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45), and five custom buffers
	Temperature Compensation	manual or automatic from -20.0 to 120.0°C (-4.0 to 248.0°F)
mV	Range	±2000 mV
	Resolution	0.1 mV
	Accuracy	±0.2 mV
	Rel mV Offset Range	±2000 mV
Temperature*	Range	-20.0 to 120.0°C (-4.0 to 248.0°F)
	Resolution	0.1°C (0.1°F)
	Accuracy	±0.2°C (±0.4°F) (excluding probe error)
Additional Specifications	pH Electrode	HI1131B pH electrode with glass body, BNC connector and 1 m (3.3') cable (included)
	Temperature Probe	HI7662-T temperature probe, stainless steel with 1 m (3.3') cable (included)
	Slope calibration	from 80 to 110%
	Log-on-demand	200 samples
	Interval Logging	5, 10, 30 seconds; 1, 2, 5, 10, 15, 30, 60, 120, 180 minutes (max 600 samples)
	PC connection	opto-isolated USB
	Input Impedance	10^{12} Ohms
	Power Supply	12 VDC adapter (included)
	Environment	0 to 50°C (32 to 122°F) RH max 55% non-condensing
	Dimensions	235 x 207 x 110 mm (9.2 x 8.14 x 4.33")
	Weight	1.8 kg (4 lbs.)
Ordering Information		**HI3220-01** (115V) and **HI3220-02** (230V) is supplied with HI1131B pH electrode, HI7662-T temperature probe, HI76404N electrode holder, HI70004 pH 4.01 buffer solution sachet, HI70007 pH 7.01 buffer solution sachet, HI700601 electrode cleaning solution sachet (2), HI7082 3.5M KCL electrolyte solution (30 mL), 12 VDC adapter and instructions.

(*) Reduced to actual sensor limits

HI122

pH Benchtop Meter

with Built-in Printer

- CAL Check™
  - Alerts users of calibration status
- Five-point calibration
  - Five pH calibration points using standard or custom buffers
- Logging
  - Automatic data logging of 1000 records and log-on-demand
- GLP features
  - Meets Good Laboratory Practices
- Direct printing
  - Built-in impact printer

On-board Printing and CAL Check™ in One Instrument

HI122 benchtop instrument features a built-in printer and CAL Check™. CAL Check™ monitors electrode response time and condition, and provides enhanced diagnostic messages during calibration.

Built-in Impact Printer

The built-in impact printer incorporated into the HI122 uses regular paper that does not fade with time. The information related to measurements being taken can be printed while in measurement, log-on-demand or internal logging modes. This model also allows users to print detailed information in four languages for specific help screens and instrument set-up.

Logging

Users can log-on-demand up to 50 samples and automatically log data up to 1000 points with flexible starting and stopping criteria.

GLP Capabilities

HI122 provides GLP capabilities that allow for the retrieval of all data regarding pH, mV, EC and salinity calibration as well as data regarding the maintenance and status of the electrode.

Calibration

This meter uses Hanna's "P" series of electrodes. Calibration can be performed up to five points using the standard seven buffers, or by using two custom buffer values. The buffer(s) used during calibration are displayed on the LCD even when in measurement mode.

Specifications		HI122
pH	Range	-2.00 to 16.00 pH; -2.000 to 16.000 pH
	Resolution	0.01 pH; 0.001 pH
	Accuracy @25°C	±0.01 pH; ±0.002 pH
	Calibration	automatic, up to five point calibration standard with seven buffers (1.68, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45) and two custom buffers
	Temperature Compensation	automatic or manual from -20.0 to 120°C (-4.0 to 248.0°F)
mV	Range	±999.9; ±2000 mV
	Resolution	0.1 mV; 1 mV
	Accuracy @25°C	±0.2 mV (±699.9 mV); ±0.5 mV (±999.9 mV); ±1 mV (±2000 mV)
	Relative mV Offset Range	±2000 mV
Temperature	Range	-20.0 to 120.0°C (-4.0 to 248.0°F)
	Resolution	0.1°C (0.1°F)
	Accuracy @25°C	±0.4°C (±0.7°F)
Additional Specifications	pH Electrode	HI1131P glass body pH electrode with BNC + pin connectors and 1 m (3.3') cable (included)
	Temperature Probe	HI7662-T temperature probe with 1 m (3.3') cable (included)
	Log-on-demand	50 samples (25 per channel)
	Interval Logging	5 second to 180 minutes, 1000 samples (500 per channel)
	Input Impedance	10^{12} Ohm
	PC Connection	RS232 serial port, opto-isolated
	Printer	built-in dot matrix printer, with 44 mm plain paper
	Power Supply	12 VDC adapter (included)
	Environment	0 to 50°C (32 to 122°F); RH max 95% non-condensing
	Dimensions	280 x 203 x 84 mm (11.0 x 8.0 x 3.3")
	Weight	1.9 kg (4.2 lbs.)
Ordering Information		**HI122-01** (115V) and **HI122-02** (230V) are supplied with HI1131P pH electrode, HI7662-T temperature probe, HI70004 pH 4.01 buffer solution sachet, HI70007 pH 7.01 buffer solution sachet, HI7082 3.5M KCL electrolyte solution (30 mL), (5) paper rolls, 12 VDC adapter and instructions.

HI2210 · HI2211

pH Benchtop Meters

- Automatic temperature compensation (ATC)
- Two-point calibration
- Simple to operate
- Reading stability indicator
- Measurement recall

The HI2211 and HI2210 are accurate and affordable benchtop pH and °C meters. The HI2211 can also be used to measure Oxidation Reduction Potential (ORP) in the mV range.

The calibration process is guided step-by-step through graphics shown on the LCD.

Designed to be easy to use, these instruments also feature a reading stability indicator used during calibration and a measurement recall function .

pH measurements for both instruments are compensated for the temperature effect manually or automatically with the HI7662 temperature probe. These instruments are also equipped with an easy-to-read LCD which shows both the primary reading and °C.

Specifications		HI2210	HI2211
pH	Range	-2.00 to 16.00 pH	-2.00 to 16.00 pH
	Resolution	0.01 pH	0.01 pH
	Accuracy	±0.01 pH	±0.01 pH
	pH Calibration	automatic, one or two-point with five memorized buffer values (pH 4.01, 6.86, 7.01, 9.18, 10.01)	
	Temperature Compensation	automatic or manual from -20.0 to 120.0°C	
mV	Range	–	±399.9 mV ; ±2000 mV
	Resolution	–	0.1 mV; 1 mV
	Accuracy	–	±0.2 mV (±399.9 mV); ±1 mV (±2000 mV)
Temperature	Range	-9.9 to 120.0°C (14.2 to 248.0°F)	
	Resolution	0.1°C	0.1°C
	Accuracy	±0.5°C	±0.5°C
Additional Specifications	pH Electrode	HI1131B glass body pH electrode with BNC connector and 1 m (3.3') cable (included)	
	Temperature Probe	HI7662 stainless steel temperature probe with 1 m (3.3') cable (included)	
	Input Impedance	10^{12} Ohm	
	Power Supply	12 VDC adapter (included)	
	Environment	0 to 50°C (32 to 122°F); RH max 95% non-condensing	
	Dimensions / Weight	240 x 187 x 74mm (9.4 x 7.1 x 2.9")	
Ordering Information	**HI2210-01** (115V), **HI2210-02** (230V), **HI2211-01** (115V) and **HI2211-02** (230V) are supplied with HI1131B pH electrode, HI7662 temperature probe, HI76404N electrode holder, HI70004 pH 4.01 buffer solution sachet, HI70007 pH 7.01 buffer solution sachet, HI7082 3.5M KCl electrolyte solution (30 mL), HI700601 cleaning solution sachet, 12 VDC adapter and instructions.		

pH and ORP electrodes begin on page 2.87; pH and ORP solutions begin on page 2.110

pH Benchtop Meters

with Manual Temperature Compensation and Analog Output

- Manual pH calibration
  - This simple to use feature provides the ability to demonstrate the concept of offset and slope. It can be calibrated to any value within the measurement ranges and is less expensive than models with automatic calibration
- Manual temperature compensation (MTC)
  - MTC provides the ability to demonstrate the effect of temperature on pH measurement. It is simple to use and allows for different temperature corrections based on the sample being tested.
- Analog output (HI22091 only)
  - Allows a recording device to be connected to the meter.
- mV range
  - These pH/mV meters can also measure ORP (oxidation reduction potential) or ion concentration (ISE) in the extended mV range with optional electrodes.
- Large LCD
  - The new, larger LCD is bright and easy to read.
- Built-in solution holders
  - These meters have solution holders built into the casing. This convenient feature saves space and prevents solutions from tipping over

The HI22091 pH/mV Meter with manual temperature compensation (MTC) and analog output provides a simple to use, cost effective method of measuring pH. The HI22091 features a large, easy to read LCD and built-in solution holders. HI2209 has all the features of the HI22091 with the exception of analog output.

In order to achieve maximum accuracy, the HI22091 and HI2209 feature manual pH calibration at one or two points. Manual calibration enables the user to select the instrument's calibration points closer to the desired range of measurement, making them ideal for applications that require custom calibration points. (In some applications, a standard calibration curve such as pH 7 or pH 4 is too far from the value of the sample to achieve the highest accuracy.

Specifications		HI2209	HI22091
pH	Range	0.00 to 14.00 pH	0.00 to 14.00 pH
	Resolution	0.01 pH	0.01 pH
	Accuracy	±0.01 pH	±0.01 pH
	Calibration	manual, one or two-point	manual, one or two-point
	Temperature Compensation	manual from 0 to 100°C (32 to 212°F)	
mV	Range	±1999 mV	±1999 mV
	Resolution	1 mV	1 mV
	Accuracy	±1 mV	±1 mV
Additional Specifications	pH Electrode	HI1332B PEI body pH electrode with BNC connector and 1 m (3.3') cable (included)	
	Input Impedance	10^{12} Ohm	10^{12} Ohm
	Analog Output	–	0 to 5 V according with: 0 to 14 pH or -1999 to +1999 mV, temp.: always 0
	Power Supply	12 VDC adapter (included)	
	Environment	0 to 50°C (32 to 122°F); RH max 95% non-condensing	
	Dimensions / Weight	235 x 222 x 109 mm (9.2 x 8.7 x 4.3") / 1.3 kg (2.9 lbs.)	
Ordering Information		**HI2209-01** (115V), **HI2209-02** (230V), **HI22091-01** (115V) and **HI22091-02** (230V) are supplied with HI1332B pH electrode, 12 VDC adapter and instruction manual.	

pH and ORP electrodes begin on page 2.87; pH and ORP solutions begin on page 2.110

HI207 · HI208

pH Meters

for Education

- Built-in 500 rpm magnetic stirrer (HI208)
- Automatic temperature compensation (ATC)
- Two-point calibration
- Built-in beaker and electrode holder

With features such as a built-in beaker holder, beaker-top electrode holder and rugged, two-in-one pH and temperature sensor, the HI207 and HI208 are meters designed to meet busy classroom environments.

These instruments also feature an extended pH range, dual-level LCD with icons for stability and buffer recognition, a built-in magnetic stirrer (HI208 only), automatic pH calibration, and temperature display in either Celsius or Fahrenheit. In addition the HI207 and HI208 feature automatic temperature compensation so that all readings are automatically compensated for temperature variations.

In the classroom, these compact units reduce clutter and utilize a minimal amount of space on the desktop. Switch to battery power and the instrument can be taken outside the classroom for field studies. When lab time is over, the instruments are easily cleaned and can be stored out of the way–right away.

Specifications		HI207 • HI208
pH	Range	-2.00 to 16.00 pH
	Resolution	0.01 pH
	Accuracy	±0.02 pH
	Calibration	automatic, one or two point with two sets of memorized buffer values (pH 4.01, 7.01, 10.01 or 4.01, 6.86, 9.18)
	Temperature Compensation	automatic from -5.0 to 105.0°C (23.0 to 221.0°F)
Temperature	Range	-5.0 to 105.0°C ; 23.0 to 221.0°F
	Resolution	0.1°C; 0.1°F
	Accuracy	±0.5 (up to 60°C); ±1°C (outside) ±1°F (up to 140°F); ±2°F (outside)
Additional Specifications	pH Electrode	HI1291D PEI body pH electrode with internal temperature sensor, DIN connector and 1 m (3.3') cable (included)
	Battery Type / Life	9V / approximately 200 hours of continuous use (without stirrer)
	Power Supply	12 VDC adapter (included)
	Environment	0 to 50°C (32 to 122°F); RH max 95%
	Dimensions / Weight	192 x 104 x 134 mm (7.6 x 4.5 x x5.3") / 420 g (14.8 oz.)
Ordering Information	**HI207-01** (115V), **HI207-02** (230V), **HI208-01** (115V) and **HI208-02** (230V) are supplied with HI1291D pH electrode, HI740035 pH electrode holder and plastic beaker, rubber O-ring, magnetic stir bar (HI208 only), HI70004 pH 4.01 buffer solution sachet, HI70007 pH 7.01 buffer solution sachet, 12 VDC adapter, battery and instructions.	

pH and ORP solutions begin on page 2.110