

# HI 3000

S E R I E S

pH/mV/ISE/Temperature Meters  
with Calibration Check™



ISO 9001:2000 Certified

 **HANNA®**  
instruments  
With Great Products, Come Great Results™  
**—USA—**

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# HI 3000 S E R I E S

## pH/mV/ISE/Temperature Meters

with Calibration Check™

- Single (HI 3220 and HI 3221) or dual (HI 3222) input channels
- Backlit, Graphic LCD
- Exclusive Calibration Check™
- Prompts and messages on the graphic LCD
- Stability, interval and Log-on-demand logging
- 5 point calibration with 7 standard and 5 custom buffers
- Relative mV measurements
- Up to 400 sample memory capacity
- Auto HOLD to freeze readings on the display
- User selectable language
- GLP to view last calibration data for pH, Rel mV or ISE
- User selectable "Outside Calibration Range" warning
- User-selectable "Calibration Timeout" to remind when a new calibration is necessary
- PC interface via USB

### Supplied Complete

HI 3222, HI 3221 and HI 3220 are supplied with:

- HI 1131B pH electrode
- HI 7662-T stainless steel temperature probe
- pH 4 and 7 buffer solutions
- Cleaning solution
- Electrolyte solution
- Electrode holder
- 12 Vdc power adapter



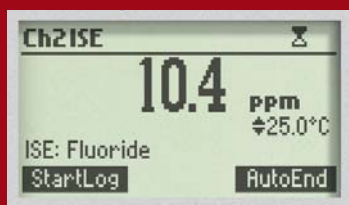
## On Screen Features

### Measurement Features



#### pH Measurement

pH readings are displayed along with temperature, calibration points, electrode condition, selected temperature compensation.



#### ISE Measurement

An ISE electrode can be attached to HI 3221 and HI 3222.



#### ORP Measurement

Just connect an optional ORP electrode to perform ORP measurements. Measurements are displayed with 0.1 mV resolution.



#### Relative mV Measurement

These instruments can also display Relative mV. When reading, the Relative mV will be displayed along with the Absolute mV value and the current temperature.



## Calibration Check™

### pH/mV/ISE/Temperature Bench Meters

HANNA's HI 3000 series of professional bench meters are designed to provide high accuracy and ease of use both in the laboratory as well as in harsh industrial conditions.

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

These instruments can be calibrated at up to 5 points with 7 standard buffers and an additional 5 custom buffers. HI 3222, HI 3221 and HI 3220 also feature a user selectable "Outside Calibration" warning as well as a user selectable "Calibration Time-out" warning.

HI 3222, HI 3221 and HI 3220 feature a powerful interactive user support menu system that assists you before, during and after measurement. On-screen tutorials guide users through set-up, calibration and measurement while context sensitive help of any screen is available at a push of a button. The help screen includes language specific assistance for

menu parameters, calibration, log, contact information and accessories for your instrument.

HI 3000 series measures ORP with a resolution of 0.1 mV and also offers an extended temperature range from -20 to 120°C (-4 to 248°F) using HI 7662-T interchangeable probes.

HI 3221 and HI 3222 feature ISE measurement modes: HI 3221 displays ISE as ppm while the HI 3222 provides a choice of units (ppb, ppm, molarity, weight/volume %). The electrode type and unit selection capability of the HI 3222 and the ion charge selection capability of the HI 3221 make these instruments extremely versatile for a wide range of ISE measurements.

HI 3222, HI 3221 and HI 3220 feature three types of logging modes (for pH, ISE and mV): stability logging, interval logging and log-on-demand. Stability logging stores measurements once the electrode has stabilized in the solution. The user can set sensitivity between fast, medium and accurate. Interval logging stores data at user defined set time intervals and log-on-demand stores data at a touch of a button. Stored data includes the parameter, test results, offset and slope, date and time. The HI 3000 series can be connected to a PC via USB. HI 92000 Windows® compatible software (optional) aids in data management.

## Logging



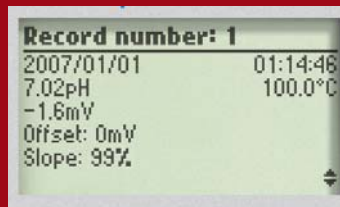
### Temperature Measurement

Use the HI 7662-T temperature probe to automatically compensate for pH measurements. Measurements can be displayed in °C or °F.



### Log and View Results

This feature allows users to log pH, Rel mV or ISE measurements for later retrieval. All logged data can be transferred to a PC through USB.



## GLP (Good Laboratory Practice)



### GLP

Last calibration data is stored automatically after a successful calibration. Calibration data can be easily accessed and includes calibration buffer, offset, slope and electrode condition information. Previous calibration points are shown in reverse text.

SPECIFICATIONS		HI 3220	HI 3221	HI 3222
Range	pH	-2.0 to 20.0; -2.00 to 20.00; -2.000 to 20.000 pH		
	mV	±2000 mV		
	ISE	—	From 1.00 x 10 <sup>-3</sup> to 1.00 x 10 <sup>5</sup> ppm	From 1.00 x 10 <sup>-7</sup> to 9.99 x 10 <sup>-10</sup> concentration (choice of units)
	Temperature	-20.0 to 120.0 °C (-4.0 to 248.0°F)		
Resolution	pH	0.1; 0.01; 0.001 pH		
	mV	0.1 mV		
	ISE	—	3 digits 0.01; 0.1; 1; 10 concentration	
	Temperature	0.1°C (0.1°F)		
Accuracy	pH	±0.01; ±0.002 pH		
	mV	±0.2 mV		
	ISE	—	±0.5% of reading (monovalent ions), ±1% of reading (divalent ions)	
	Temperature	±0.2°C (±0.4°F) (excluding probe error)		
Calibration	pH	Up to 5 point calibration, 7 standard buffers available (1.68, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45) + 5 custom buffers		
	ISE	—	Up to 2 point calibration, 6 standard solutions (0.1, 1, 10, 100, 1000, 10000 ppm)	Up to 5 point calibration, 6 standard solutions (in units selected)
	Slope	From 80 to 110%		
Temperature Compensation (pH)		Manual or automatic from -20.0 to 120.0°C (-4.0 to 248.0°F)		
Input Channels		1	1	2
Probes		HI 1131B pH with BNC connector and HI 7662-T stainless steel temperature probe (included)		
Logging		Log-on-demand 200 samples	Log-on-demand 300 samples	Log-on-demand 400 samples
Lot Logging		5, 10, 30 sec 1, 2, 5, 10, 15, 30, 60, 120, 180 min (max 600 samples)		
PC Connectivity		Opto-isolated USB (with HI 92000 software)		
Input Impedance		10 <sup>12</sup> Ohms		
Power Supply		12 VDC		
Environment		0-50°C (32 to 122°F) Max. RH 55% non-condensing		
Dimensions		235 x 207 x 110 mm (9.2 x 8.14 x 4.33")		
Weight		1.8 kg (4.1 lbs.)		

### ORDERING INFORMATION

**HI 3220-01** (115V) and **HI 3220-02** (230V), **HI 3221-01** (115V) and **HI 3221-02** (230V), **HI 3222-01** (115V) and **HI 3222-02** (230V) are supplied with HI 1131B pH electrode with BNC connector and 1 m cable, HI 7662-T stainless steel temperature probe, pH 4 and 7 buffer solutions, cleaning solution, electrolyte solution, electrode holder, 12 Vdc power adapter and instructions.

### ELECTRODES

All electrodes part numbers ending in "B" are supplied with a BNC connector & 1 m (3.3') cable, as shown below:

- HI 1043B** Use: *strong acid/alkalis*; Glass-body, double junction, refillable, combination pH electrode
- HI 1053B** Use: *emulsions*; Glass-body, triple ceramic, refillable, combination pH electrode

- HI 1083B** Use: *biotechnology*; Glass-body, open junction, refillable, combination pH electrode
- HI 1131B** Use: *general purpose*; Glass-body, single junction, refillable, combination pH electrode
- HI 3230B** Use: *general purpose*; Plastic-body, gel-filled, combination platinum ORP electrode
- HI 7662-T** Stainless steel temperature probe
- SOLUTIONS**
- HI 5004** pH 4.01 buffer solution, 500 mL
- HI 5007** pH 7.01 buffer solution, 500 mL
- HI 5010** pH 10.01 buffer solution, 500 mL
- HI 54710** pH 4.01, pH 7.01 and pH 10.01 buffer solution, 500 mL ea.
- HI 7020L** ORP test solution, 200-275 mV, 500 mL
- HI 7021L** ORP test solution, 240 mV, 500 mL

- HI 7022L** ORP test solution, 470 mV, 500 mL
- HI 7091L** Reducing Pretreatment ORP solution, 500 mL
- HI 7092L** Oxidizing Pretreatment ORP solution, 500 mL
- HI 7071** 3.5M KCl + AgCl Electrolyte, (4) 30 mL, for single junction electrodes
- HI 7082** 3.5M KCl Electrolyte, (4) 30 mL, for double junction electrodes
- HI 7061L** Electrode cleaning solution, 500 mL
- HI 70300L** Electrode storage solution, 500 mL

HI 50XX buffers are technical buffers with ±.01 accuracy and are provided with certificate

### ACCESSORIES

- HI 740157** Plastic refilling pipette (20)
- HI 76405** Electrode holder
- HI 92000** Windows® compatible software
- HI 920013** USB cable for PC connection



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