



HI3000 Series  
pH, ISE, and EC Bench Meters



## HI3000 Series

# pH, ISE, and EC Bench Meters

HI3000 series are professional pH bench meters with a graphic LCD, designed to provide high accuracy and ease of use in laboratory settings as well as in harsh industrial conditions.

HI220 is a single input model measuring pH, ORP, and temperature utilizing a single channel.

HI221 is a single input model measuring pH, ORP, or ISE and temperature utilizing a single channel.

HI222 is a dual input model measuring pH or ORP and temperature on channel 1; and ISE or ORP and temperature on channel 2.

HI312 is a dual input model measuring pH, ORP, or ISE and temperature on channel 1; and EC, Resistivity, TDS, and Salinity (measuring with an EC probe) on channel 2.

A relative mV feature is available for all models.

These instruments feature Hanna's exclusive Calibration Check diagnostics system that eliminates erroneous readings due to dirty (faulty) pH electrodes or contaminated buffer solution by alerting users of potential problems during the calibration process.

Throughout the calibration process, users are guided step-by-step by the on-screen tutorial. After calibration, a probe condition indicator informs users of the overall electrode status.

A variety of interactive user support is available 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 accessed via a dedicated HELP button, includes language specific assistance for menu parameters, calibration, log, contact information and accessories.

## Features Across the Series



### HI3220 pH/ORP/Temperature

- Single input channel
- Up to 5 point pH calibration with 7 standard buffers and 5 custom buffers to choose from
- Calibration with millesimal pH buffers (with meter resolution set to 0.001 pH)
- Messages on the graphic LCD for an easy and accurate calibration
- Diagnostic feature, to alert the user when the electrode needs cleaning
- Three logging modes (for pH and mV)
  - Stability logging
  - Interval logging
  - Log-on-demand
- Relative mV measurements
- Log on demand, up to 200 samples
- Log interval with log on stability feature, up to 600 records
- Auto Hold feature, to freeze first stable reading on the LCD
- GLP feature, to view last calibration data for pH or Rel mV
- PC interface



### HI3221 pH/ORP/ISE/Temperature

- Single input channel
- Up to 5 point pH calibration with 7 standard buffers and 5 custom buffers to choose from
- Calibration with millesimal pH buffers (with meter resolution set to 0.001 pH)
- Messages on the graphic LCD for an easy and accurate calibration
- Diagnostic feature, to alert the user when the electrode needs cleaning
- Three logging modes (for pH, ISE and mV)
  - Stability logging
  - Interval logging
  - Log-on-demand
- Relative mV measurements
- Log on demand, up to 300 samples
- Log interval with log on stability feature, up to 600 records
- Auto Hold feature, to freeze first stable reading on the LCD
- GLP feature, to view last calibration data for pH, Rel mV or ISE
- PC interface



### HI3222 pH/ORP/ISE/Temperature

- Dual input channel
  - pH/mV and temperature measurements (Channel 1)
  - ISE/mV and temperature measurements (Channel 2)
- Up to 5 point pH calibration with 7 standard buffers and 5 custom buffers to choose from
- Calibration with millesimal pH buffers (with meter resolution set to 0.001 pH)
- Messages on the graphic LCD for an easy and accurate calibration
- Diagnostic feature, to alert the user when the electrode needs cleaning
- Three logging modes (for pH, ISE and mV)
  - Stability logging
  - Interval logging
  - Log-on-demand
- Relative mV measurements
- Log on demand, up to 400 samples
- Log interval with log on stability feature, up to 600 records
- Auto Hold feature, to freeze first stable reading on the LCD
- GLP feature, to view last calibration data for pH, Rel mV or ISE
- PC interface



### HI3512 pH/ORP/ISE/EC/Resistivity/ TDS/NaCl/Temperature

- Dual input channel
  - pH/mV/ISE and temperature measurements (Channel 1)
  - EC/TDS, NaCl/Resistivity and temperature measurements (Channel 2)
- Up to 5 point pH calibration with 7 standard buffers and 2 custom buffers to choose from
- Calibration with millesimal pH buffers (with meter resolution set to 0.001 pH)
- Up to 2 point EC calibration with 7 memorized standards to choose from
- Messages on the graphic LCD for an easy and accurate calibration
- Diagnostic feature, to alert the user when the electrode needs cleaning
- Relative mV measurements
- Log on demand, up to 400 samples
- Log interval with log on stability feature, up to 600 records
- Auto Hold feature, to freeze first stable reading on the LCD
- GLP feature, to view last calibration data for pH, Rel mV, ISE, EC, or NaCl
- PC interface

## On-Screen Features

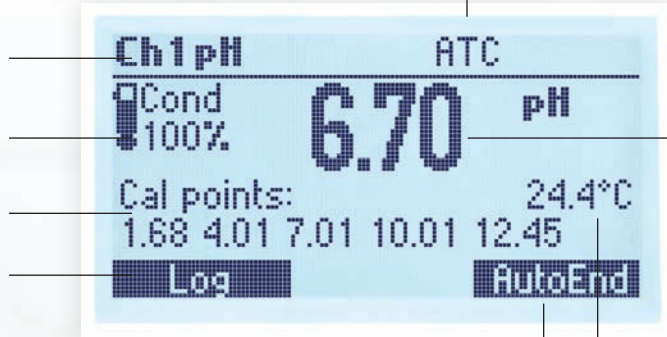
Current parameter on screen (dual channel models also display channel number)

Electrode condition

Current calibration points

Records current reading when the Log button is pressed (log on demand), Lot Logging (log interval) mode is also available (StartLog)

Automatic temperature compensation (ATC).  
Manual temperature compensation (MTC) also available



Main reading

Instrument will wait for a stable reading before logging measurement

Temperature reading



HI3512 shown with:  
HI76404W electrode holder,  
HI1131B pH electrode,  
HI76310 EC probe, and  
HI7662-TW temperature probe  
(sold separately).

## Measurement Screen Examples



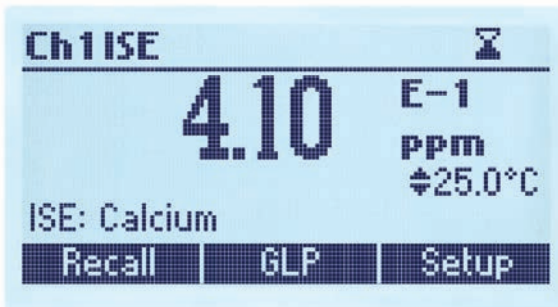
pH



mV



Relative mV



ISE



EC



Resistivity

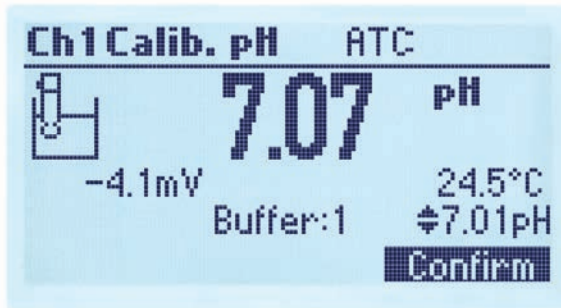


TDS



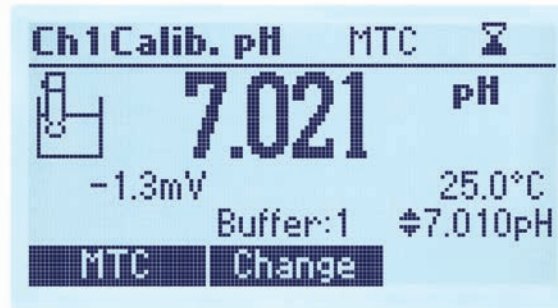
NaCl

## Calibration Features



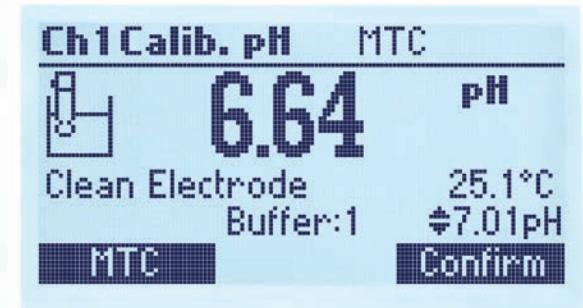
### Automatic Calibration

The HI3000 series features on screen instructions to guide users step-by-step throughout the calibration process.



### Calibration with Millesimal pH Buffers

Closely bracket the measurement range of interest and ensure an accurate measurement using these buffers when the resolution of the meter set to 0.001 pH.



### Error Screens

On-screen warnings alert users of pH, mV or ISE calibration issues such as Wrong Buffer, Electrode Dirty/Broken, Buffer Contaminated, Wrong Standard, and Wrong Relative Offset.

## Dedicated buttons for quick access to key features



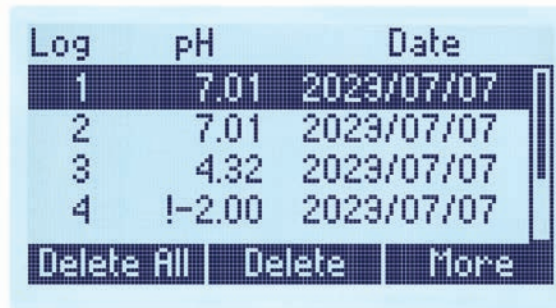
## Logging Features



### Log Measurements

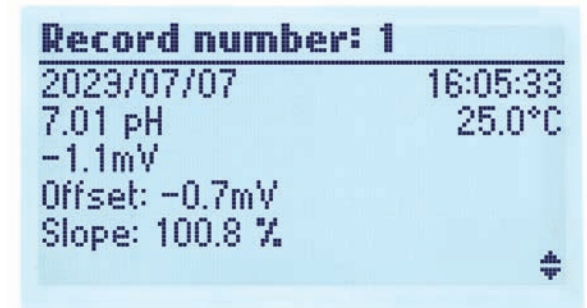
To store the current reading, press LOG while in measurement mode.

When Lot Logging is enabled, press the StartLog key to start Log interval and StopLog key to stop.



### Access Logged Data

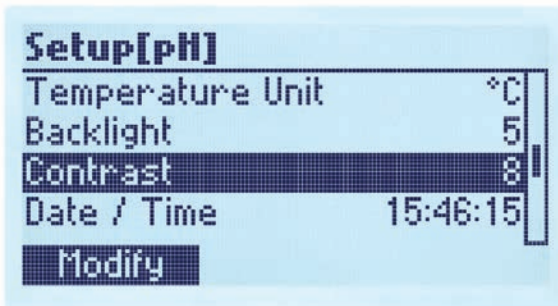
Press the Recall key to retrieve stored information.



### View Records

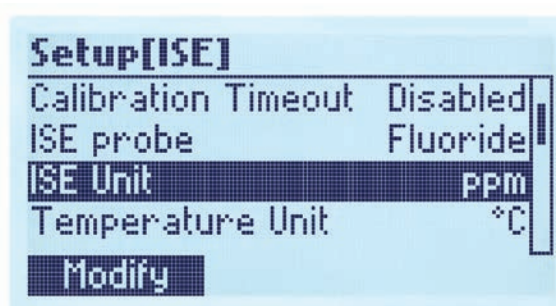
Logged records can be viewed individually.

## Setup Features



### Setup Screens

Use this menu to configure calibration "DUE" reminder, resolution, operating language, temperature unit (°C or °F), log interval, custom buffers, ISE unit and probe type (applicable models), screen backlight and contrast, date and time, and more.



## GLP



### Good Laboratory Practice (GLP)

GLP is a set of functions that allows storage and retrieval of data regarding the maintenance and status of the electrode. All data regarding pH, Rel mV or ISE calibration is stored for the user to review when necessary.

The "expired calibration" status is triggered when the instrument detects a calibration time out. The "CAL DUE" warning is displayed blinking to warn the user that the instrument should be recalibrated.

## Specifications

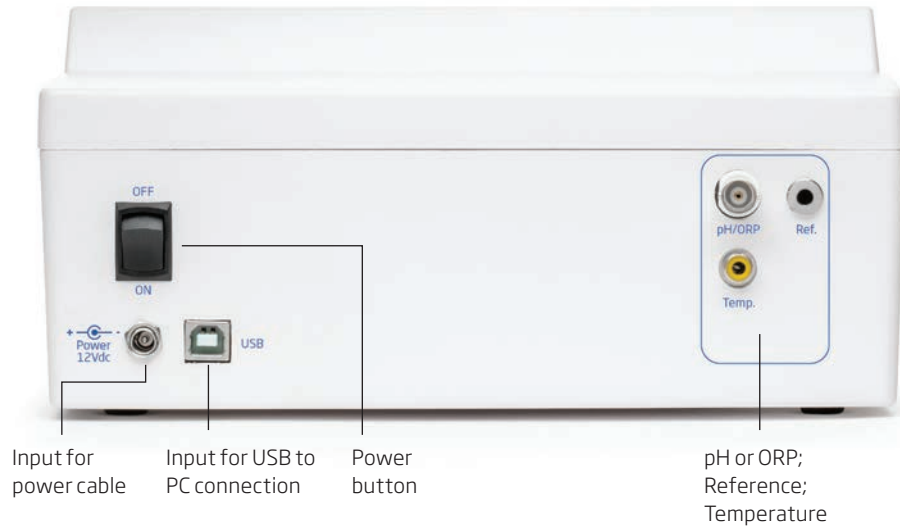
		HI3220 (Single input) Channel 1: pH or ORP; Reference; Temperature	HI3221 (Single input) Channel 1: pH, ORP, or ISE; Reference; Temperature	HI3222 (Dual input) Channel 1: pH or ORP; Reference; Temperature Channel 2: ISE or ORP; Reference; Temperature	HI3512 (Dual input) Channel 1: pH, ORP, or ISE; Reference; Temperature Channel 2: EC
pH	Range	-2.0 to 20.0 pH; -2.00 to 20.00 pH -2.000 to 20.000 pH	-2.0 to 20.0 pH; -2.00 to 20.00 pH -2.000 to 20.000 pH	-2.0 to 20.0 pH; -2.00 to 20.00 pH -2.000 to 20.000 pH	-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	0.1 pH; 0.01 pH; 0.001 pH	0.1 pH; 0.01 pH; 0.001 pH	0.1 pH; 0.01 pH; 0.001 pH
	Accuracy	±0.01 pH; ±0.002 pH	±0.01 pH; ±0.002 pH	±0.01 pH; ±0.002 pH	±0.01 pH; ±0.002 pH
	Calibration	Up to 5 points 7 standard buffers (1.68; 4.01; 6.86; 7.01; 9.18; 10.01; 12.45) 5 custom buffers	Up to 5 points 7 standard buffers (1.68; 4.01; 6.86; 7.01; 9.18; 10.01; 12.45) 5 custom buffers	Up to 5 points 7 standard buffers (1.68; 4.01; 6.86; 7.01; 9.18; 10.01; 12.45) 5 custom buffers	Up to 5 points 7 standard buffers (1.68; 4.01; 6.86; 7.01; 9.18; 10.01; 12.45) 2 custom buffers
ORP	Range	±2000.0 mV	±2000.0 mV	±2000.0 mV	±2000.0 mV
	Resolution	0.1 mV	0.1 mV	0.1 mV	0.1 mV
	Accuracy	±0.2 mV	±0.2 mV	±0.2 mV	±0.2 mV
ISE	Range	–	1.00 E-3 to 1.00 E5 conc.	1.00 E-3 to 1.00 E5 conc.	1.00 E-7 to 9.99 E10 conc.
	Resolution	–	3 digits 0.01; 0.1; 1; 10 conc.	3 digits 0.01; 0.1; 1; 10 conc.	3 digits 0.01, 0.1, 1, 10 conc.
	Accuracy	–	±0.5% of reading (monovalent ions) ±1% of reading (divalent ions)	±0.5% of reading (monovalent ions) ±1% of reading (divalent ions)	±0.5% of reading (monovalent ions) ±1% of reading (divalent ions)
	Calibration	–	Up to 2 points 6 standards (0.1; 1; 10; 100; 1000; 10000 ppm)	Up to 5 points 6 standards (0.1; 1; 10; 100; 1000; 10000 ppm)	Up to 5 points 6 standards (0.1; 1; 10; 100; 1000; 10000 ppm)
Temperature Channel 1	Range	-20.0 to 120.0 °C (-4.0 to 248.0 °F)	-20.0 to 120.0 °C (-4.0 to 248.0 °F)	-20.0 to 120.0 °C (-4.0 to 248.0 °F)	-20.0 to 120.0 °C (-4.0 to 248.0 °F)
	Resolution	0.1 °C (0.1 °F)	0.1 °C (0.1 °F)	0.1 °C (0.1 °F)	0.1 °C (0.1 °F)
	Accuracy	±0.2 °C (±0.4 °F) (excluding probe error)	±0.2 °C (±0.4 °F) (excluding probe error)	±0.2 °C (±0.4 °F) (excluding probe error)	±0.2 °C (±0.4 °F) (excluding probe error)
Additional Specifications Channel 1	Relative mV Offset Range	±2000 mV	±2000 mV	±2000 mV	±2000 mV
	Slope calibration	From 80 to 110%	From 80 to 110%	From 80 to 110%	From 80 to 110%
	pH Temperature compensation	Manual Automatic	Manual Automatic	Manual Automatic	Manual Automatic
	pH/ORP/ISE Electrode	BNC	BNC	BNC	BNC
	Temperature probe	RCA connection Recommended option: HI7662-TW	RCA connection Recommended option: HI7662-TW	RCA connection Recommended option: HI7662-TW	RCA connection Recommended option: HI7662-TW
EC	Range	–	–	–	0 to 400 mS/cm (shows values up to 1000 mS/cm) Actual conductivity 1000 mS/cm 0.001 to 9.999 µS/cm; 10.00 to 99.99 µS/cm; 100.0 to 999.9 µS/cm; 1.000 to 9.999 mS/cm; 10.00 to 99.99 mS/cm; 100.0 to 999.9 mS/cm; 1000 mS/cm; (autoranging)
	Resolution	–	–	–	0.001 µS/cm; 0.01 µS/cm; 0.1 µS/cm; 0.001 mS/cm; 0.01 mS/cm; 0.1 mS/cm; 1 mS/cm
	Accuracy	–	–	–	±1% of reading (±0.01 µS/cm or 1 digit whichever greater) excluding probe error
	Calibration	–	–	–	Up to 2 points 7 standards (0.00 µS/cm; 84.0 µS/cm; 1.413 mS/cm; 5.00 mS/cm; 12.88 mS/cm; 80.0 mS/cm; 111.8 mS/cm)



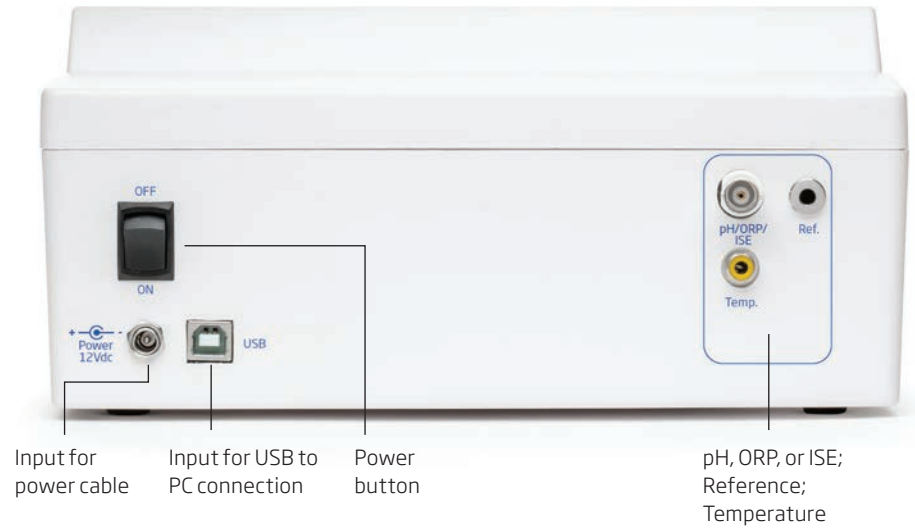
		HI3220	HI3221	HI3222	HI3512
Resistivity	Range	-	-	-	1.0 to 99.9 Ω; 100 to 999 Ω; 1.00 to 9.99 KΩ; 10.0 to 99.9 KΩ; 100 to 999 KΩ; 1.00 to 9.99 MΩ; 10.0 to 100.0 MΩ (autoranging)
	Resolution	-	-	-	0.1 Ω; 1 Ω; 0.01 KΩ; 0.1 KΩ; 1 KΩ; 0.01 MΩ; 0.1 MΩ
	Accuracy	-	-	-	±1% of reading (±10 Ω or 1 digit whichever greater) excluding probe error
TDS	Range	-	-	-	0.000 to 9.999 ppm; 10.00 to 99.99 ppm; 100.0 to 999.9 ppm; 1.000 to 9.999 g/L; 10.00 to 99.99 g/L; 100.0 to 400.0 g/L (autoranging)
	Resolution	-	-	-	0.001 ppm; 0.01 ppm; 0.1 ppm; 0.001 g/L; 0.01 g/L; 0.1 g/L
	Accuracy	-	-	-	±1% of reading (±0.05 ppm or 1 digit whichever greater) excluding probe error
	TDS factor	-	-	-	0.40 to 1.00
Salinity	Range	-	-	-	% NaCl: 0.0 to 400.0 %
	Resolution	-	-	-	0.1 %
	Accuracy	-	-	-	±1% of reading excluding probe error
	NaCl Calibration	-	-	-	Max. 1 point only (with HI7073 standard)
Temperature Channel 2	Range	-	-	-20.0 to 120.0 °C (-4.0 to 248.0 °F)	-20.0 to 120.0 °C (-4.0 to 248.0 °F)
	Resolution	-	-	0.1 °C (0.1 °F)	0.1 °C (0.1 °F)
	Accuracy	-	-	±0.2 °C (±0.4 °F) (excluding probe error)	±0.2 °C (±0.4 °F) (excluding probe error)
Additional Specifications HI3512 Channel 2	Cell constant setup	-	-	-	0.010 to 10.000
	EC probe	-	-	-	DIN connection Recommended option: HI76310
	Temperature source	-	-	-	Automatic Manual
	EC temperature compensation	-	-	-	NoTC, MTC, ATC
	Reference temperature	-	-	-	15, 20, 25 °C
Additional Specifications	LOG on demand	200 samples	300 samples	400 samples	400 samples
	Lot Logging	5, 10, 30 seconds 1, 2, 5, 10, 15, 30, 60, 120, 180 minutes, AutoEnd (maximum 600 samples)	5, 10, 30 seconds 1, 2, 5, 10, 15, 30, 60, 120, 180 minutes, AutoEnd (maximum 600 samples)	5, 10, 30 seconds 1, 2, 5, 10, 15, 30, 60, 120, 180 minutes, AutoEnd (maximum 600 samples)	5, 10, 30 seconds 1, 2, 5, 10, 15, 30, 60, 120, 180 minutes, AutoEnd (maximum 600 samples)
	Power Supply	12 Vdc power adapter	12 Vdc power adapter	12 Vdc power adapter	12 Vdc power adapter
	PC Interface	opto-isolated USB	opto-isolated USB	opto-isolated USB	opto-isolated USB
	Environment	0 to 50 °C (32 to 122 °F) max. RH 55% non-condensing	0 to 50 °C (32 to 122 °F) max. RH 55% non-condensing	0 to 50 °C (32 to 122 °F) max. RH 55% non-condensing	0 to 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")	235 x 207 x 110 mm (9.2 x 8.14 x 4.33")	235 x 207 x 110 mm (9.2 x 8.14 x 4.33")	235 x 207 x 110 mm (9.2 x 8.14 x 4.33")
	Weight	1.8 Kg (4.1 lb)	1.8 Kg (4.1 lb)	1.8 Kg (4.1 lb)	1.8 Kg (4.1 lb)
Ordering Information		<b>HI3220-01</b> (115V) and <b>HI3220-02</b> (230V) are supplied with 12 Vdc power adapter and quick reference guide with instrument quality certificate.	<b>HI3221-01</b> (115V) and <b>HI3221-02</b> (230V) are supplied with 12 Vdc power adapter and quick reference guide with instrument quality certificate.	<b>HI3222-01</b> (115V) and <b>HI3222-02</b> (230V) are supplied with 12 Vdc power adapter and quick reference guide with instrument quality certificate.	<b>HI3512-01</b> (115V) and <b>HI3512-02</b> (230V) are supplied with 12 Vdc power adapter and quick reference guide with instrument quality certificate.

## Rear views

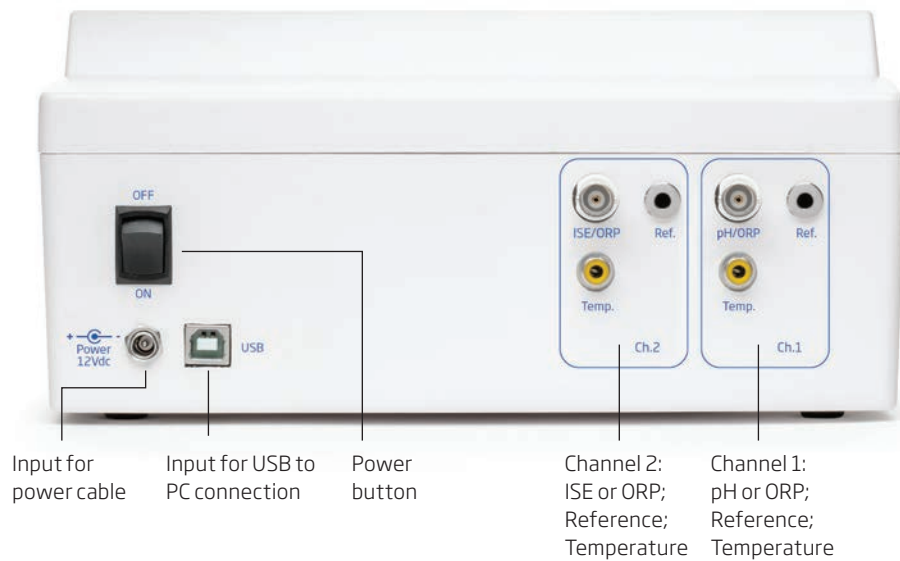
### HI3220 (Single input)



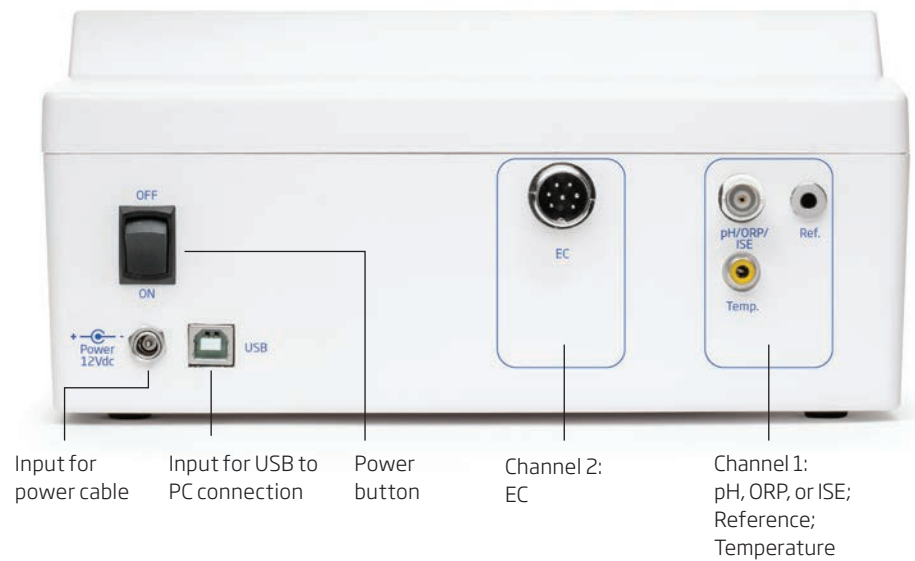
### HI3221 (Single input)



### HI3222 (Dual input)



### HI3512 (Dual input)



## Accessories



### ±0.01 pH Technical Calibration Solutions

**HI5016** pH 1.68 Buffer Solution, 500 mL bottle

**HI5004** pH 4.01 Buffer Solution, 500 mL bottle

**HI5068** pH 6.86 Buffer Solution, 500 mL bottle

**HI5007** pH 7.01 Buffer Solution, 500 mL bottle

**HI5091** pH 9.18 Buffer Solution, 500 mL bottle

**HI5010** pH 10.01 Buffer Solution, 500 mL bottle

**HI5124** pH 12.45 Buffer Solution, 500 mL bottle

### ±0.002 pH Millesimal Calibration Solutions

**HI6016** pH 1.679 Buffer Solution, 500 mL bottle

**HI6004** pH 4.010 Buffer Solution, 500 mL bottle

**HI6068** pH 6.862 Buffer Solution, 500 mL bottle

**HI6007** pH 7.010 Buffer Solution, 500 mL bottle

**HI6091** pH 9.177 Buffer Solution, 500 mL bottle

**HI6010** pH 10.010 Buffer Solution, 500 mL bottle

**HI6124** pH 12.450 Buffer Solution, 500 mL bottle

## pH Electrodes

**HI1043B** Glass-body, double junction, refillable, combination pH electrode.  
Use: strong acid/alkali

**HI1053B** Glass-body, triple ceramic, conic shape, refillable, combination pH electrode.  
Use: emulsions

**HI1083B** Glass-body, micro, viscolene, non-refillable, combination pH electrode.  
Use: biotechnology, micro titration.

**HI1131B** Glass-body, double junction, refillable, combination pH electrode.  
Use: general purpose

**HI1330B** Glass-body, semi-micro, single junction, refillable, combination pH electrode.  
Use: laboratory, vials

**HI1331B** Glass-body, semi-micro, single junction, refillable, combination pH electrode.  
Use: flasks.

**HI1230B** Plastic-body (PEI), double junction, gel-filled, combination pH electrode.  
Use: general, field

**FC911B** Plastic-body (PVDF), double junction, refillable with built-in amplifier, combination pH electrode.  
Use: very high humidity



**HI1413B** Glass-body, single junction, flat tip, viscolene, non-refillable, combination pH electrode.  
Use: surface measurement

## ORP Electrodes



**HI3230B** Plastic-body, gel-filled, combination platinum ORP electrode.  
Use: general purpose

**HI4430B** Plastic-body (PES), gel-filled, combination gold ORP electrode.  
Use: general purpose.

## ORP Pretreatment Solutions

**HI7091L** Reducing Pretreatment Solution, 500 mL bottle +14 g (set)

**HI7092L** Oxidizing Pretreatment Solution, 500 mL bottle

## ORP Solutions



**HI7021L** Test Solution 240 mV, 500 mL bottle

**HI7022L** Test Solution 470 mV, 500 mL bottle

## Electrode Cleaning Solution

**HI7061L** General Purpose Solution, 500 mL bottle

## Electrode Storage Solution

**HI70300L** Storage Solution, 500 mL bottle

## EC Probe

**HI76310** Platinum, four-ring EC/TDS probe with a built-in temperature sensor and DIN connection

## EC Calibration Solutions

**HI6033** 84  $\mu\text{S}/\text{cm}$ , 500 mL bottle

**HI6031** 1413  $\mu\text{S}/\text{cm}$ , 500 mL bottle

**HI7039L** 5000  $\mu\text{S}/\text{cm}$ , 500 mL bottle

**HI7030L** 12880  $\mu\text{S}/\text{cm}$ , 500 mL bottle

**HI7034L** 80000  $\mu\text{S}/\text{cm}$ , 500 mL bottle

**HI7035L** 111800  $\mu\text{S}/\text{cm}$ , 500 mL bottle

**HI7037L** 100% NaCl, 500 mL bottle



## Other Accessories

**HI76404W** Electrode holder

**HI7662-TW** Stainless steel temperature probe with 1 m (3.3') screened cable



