

HI83399

# Multiparameter Photometer with COD for Water and Wastewater

with Digital pH Electrode Input

HI83399 benchtop photometer measures 40 different key water and wastewater quality parameters using 77 different methods that allow for multiple ranges and variations in chemistry for specific applications. The Chemical Oxygen Demand (COD) parameter is included for industrial and municipal wastewater treatment. The Phosphorous and Nitrogen parameters included are beneficial to municipal wastewater treatment customers that need to monitor their biological and chemical nutrient removal process. This photometer features an innovative optical system that uses LEDs, narrow band interference filters, focusing lens and both a silicon photodetector for absorbance measurement and a reference detector to maintain a consistent light source ensures accurate and repeatable photometric readings every time.

To save valuable laboratory benchtop space, the HI83399 doubles as a professional pH meter with its digital pH/temperature electrode input. Now one meter can be used for both photometric and pH measurements.

## • Water and wastewater treatment digestion parameters

- Allows measurement of COD, Total Nitrogen and Total Phosphorus

## • Advanced optical system

- Innovative optical design that utilizes a reference detector and focusing lens to eliminate errors from changes in the light source and from imperfections in the glass cuvette.

## • Backlit 128 x 64 Pixel Graphic LCD Display

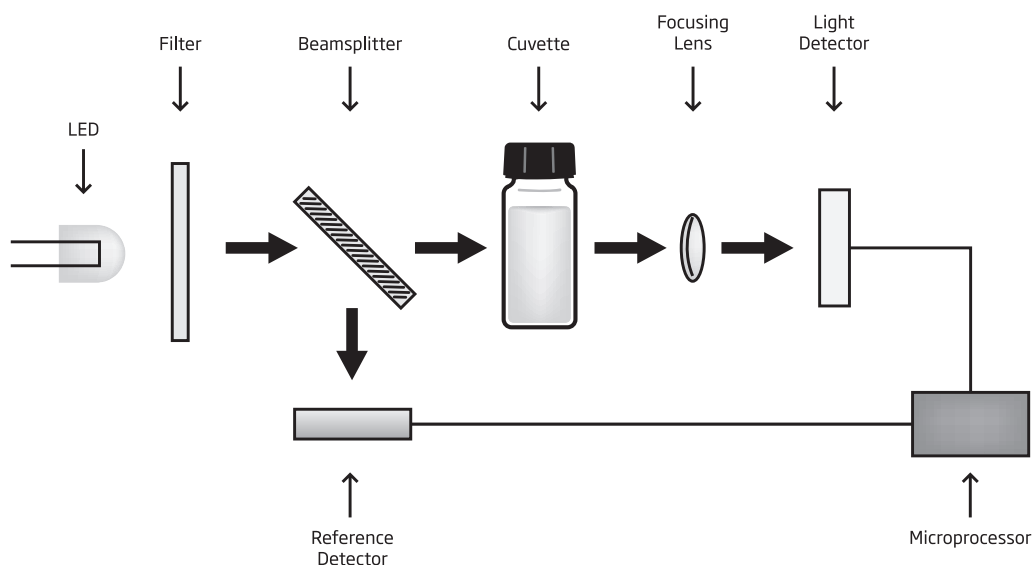
- Backlit graphic display allows for easy viewing in low light conditions
- The 128 x 64 Pixel LCD allows for a simplified user interface with virtual keys and on-screen help to guide the user through use of the meter

## • Built-in Reaction Timer for Photometric Measurements

- The measurement is taken after the countdown timer expires.



- Countdown timer ensures that all readings are taken at the appropriate reaction intervals regardless of user for better consistency in measurements
- **Absorbance mode**
  - Hanna's exclusive CAL Check cuvettes for validation of light source and detector
  - Allows for the user to plot concentration versus absorbance for a specific wavelength for use with user supplied chemistry or for teaching principles of photometry
- **Units of Measure**
  - Appropriate unit of measure along with chemical form is displayed along with reading
- **Result Conversion**
  - Automatically convert readings to other chemical forms with the touch of a button
- **Cuvette Cover**
  - Aids in preventing stray light from affecting measurements
- **Digital pH Electrode Input**
  - Measure pH and temperature with a single probe
  - Good Laboratory Practice (GLP) to track calibration information including date, time, buffers used, offset and slope for traceability
- pH CAL Check alerts user to potential problems during the calibration process
- Space saving having a pH meter and photometer built into one meter
- **Data Logging**
  - Up to 1000 photometric and pH readings can be stored by simply pressing the dedicated LOG button. Logged readings are just as easily recalled by pressing the RCL button
  - Sample ID and User ID information can be added to a logged reading using alphanumeric keypad
- **Connectivity**
  - Logged readings can be quickly and easily transferred to a flash drive using the USB-A host port or to a computer using the micro USB-B port
  - Data is exported as a .CSV file for use with common spreadsheet programs
- **Rechargeable Battery**
  - Li-polymer rechargeable battery lasts for 500 measurements or 50 hours of pH measurement
- **Battery Status Indicator**
  - Indicates the amount of battery life left
- **Error Messages**
  - Photometric error messages
  - pH calibration messages include clean electrode, check buffer and check probe



## Improved Optical System

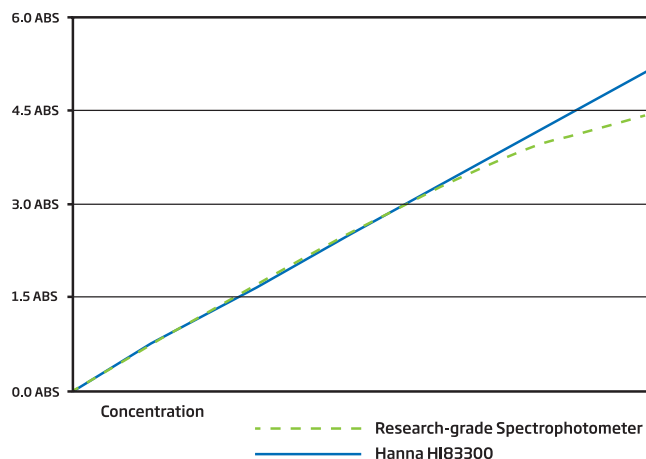
HI83300 family is designed with an innovative optical system that incorporates a beam splitter so that light can be used for absorbance readings and for a reference detector. The reference detector monitors the intensity of light and modulates when there is drift due to power fluctuation or the heating of the optical components. Each part has an important role in providing unparalleled performance from a photometer.

## High Efficiency LED Light Source

An LED light source offers superior performance as compared to a tungsten lamp. LEDs have a much higher luminous efficiency, providing more light while using less power. They also produce very little heat, which could otherwise affect the optical components and electronic stability.

## Quality Narrow Band Interference Filters

The narrow band interference filter not only ensures greater wavelength accuracy ( $\pm 1$  nm) but is also extremely efficient, allowing a brighter, stronger signal to be transmitted. The end result is increased measurement stability and less wavelength error.



- Better linearity than research-grade spectrophotometers

## Reference Detector for a Stable Light Source

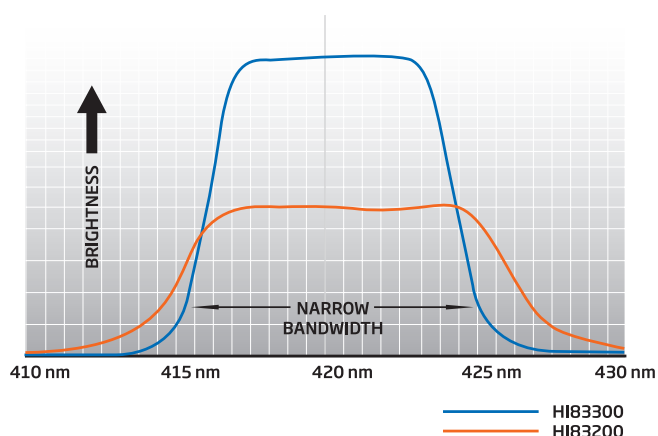
A beam splitter is used as part of the internal reference system of the HI83300 photometer. The reference detector compensates for any drift due to power fluctuations or ambient temperature changes. Now you can rely on a stable source of light.

## Large Cuvette Size

The sample cell of the HI83300 fits a round, glass cuvette with a 25 mm path length. Along with the advanced optical components, the larger size of the cuvette greatly reduces errors in rotation from the indexing mark of the cuvettes. The relatively long path length of the sample cuvette allows the light to pass through more of the sample solution, ensuring accurate measurements even in low absorbance samples.

## Focusing Lens for Greater Light Yield

Adding a focusing lens to the optical path allows for the collection of all of the light that exits the cuvette and focusing the light on the silicon photo detector. This innovative approach to photometric measurements cancels the errors from imperfections and scratches present in the glass cuvette eliminating the need to index the cuvette.



- Improved optical filters – higher wavelength accuracy and light throughput



## Cuvette Adapter

The HI83399 is supplied with a 16 mm cuvette adapter that accepts digestion vials.



## Digestion Vial Methods

Compatible with COD (EPA, ISO, and mercury free methods), Nitrogen and Phosphorous reagents packaged in 16 mm digestion vial. Reagents are sold separately.



## COD Reactor for Digestion Vials

A COD reactor is used to heat the digestion vials. The digestion vials must be heated to a specific temperature for a period time making the HI839800 an important accessory required to have a complete wastewater treatment monitoring system. HI839800 sold separately.

## Connectivity



### ① pH Connectivity

Any of our digital pH electrodes can be connected to the HI83300 family by a 3.5 mm input. Plugging in an electrode has never been easier; there are no alignment issues or broken pins. Simply connect the electrode and start taking measurements.

### ② Dual Power Supply

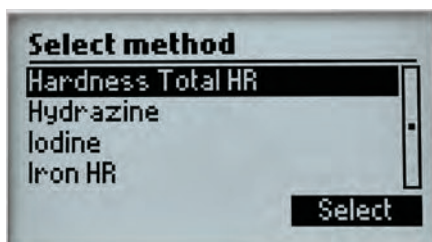
The HI83399 is equipped with a rechargeable lithium ion battery that lasts up to 500

photometer measurements or 50 hours of continuous pH measurements. A power supply can also be plugged into the micro USB port at the back of the meter.

### ② ③ USB Connectivity

Both a USB and micro USB port are located on the HI83399. Each of these ports can be used to transfer data via flash drive or direct connection to a PC or MAC. Data is transferred as CSV files for easy processing and widespread compatibility.

## Photometer Capabilities



### Concentration Measurement Function

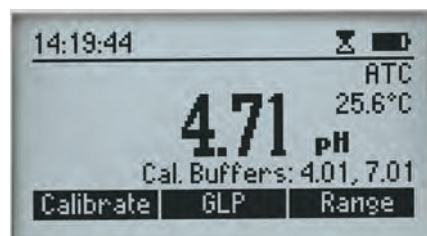
Users can access the menu of measurement methods with the simple press of a button. Low, medium, and high range methods of several parameters are available for users to obtain a high accuracy reading. Each method is assigned a concentration unit of measure. Parameters can be expressed in different chemical forms based on their preference.

### CAL Check Functionality

Hanna's exclusive CAL Check feature allows for performance verification of the independent measuring channels. Our CAL Check standard vials are developed to simulate a specific absorbance value at each wavelength to verify its' accuracy.

### Built-in Reaction Timer

Reaction time is of key importance when performing colorimetric measurements, which is why the built-in timer of the HI83300 is an ideal feature. The countdown timer displays the time remaining until a measurement will be taken, ensuring consistent results between measurements and users.



### pH Measurement

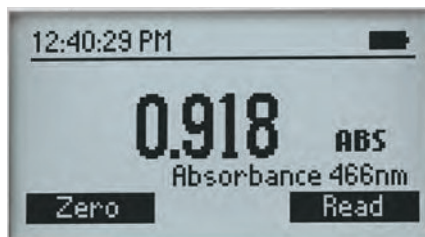
The HI83300 family offers the ability to connect a digital pH electrode. Users can connect any sensor from our extensive line of digital pH electrodes. Whether a user requires a glass or plastic body, a spheric or conic tip shape, or the ability for safe use with food samples, our digital electrode offering is suitable for nearly everyone.



### Large Cuvettes

The sample cell of these meters fits a round, glass cuvette with a 25 mm path length. The relatively long path length of the sample cuvette allows the light to pass through more of the sample solution, ensuring accurate measurements even in low absorbance samples. This cuvette size also provides a larger opening, making it easier for users to dispense ready-made liquid or powder reagents into the sample.

An affixed, light-blocking cover panel closes over the sample cell, reducing stray light from affecting any measurement readings.



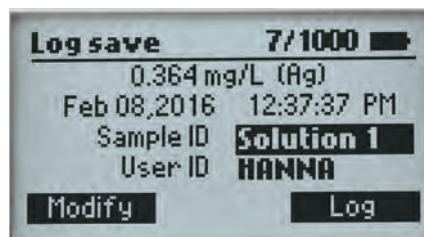
### Absorbance Measurement Mode

Users can select to calibrate and measure samples in absorbance mode for each wavelength used by the meter. This mode is a convenient way for users to develop their own calibration curves and measure samples with customized chemistries.

## Data Management Capabilities

### User ID and Sample ID

An alphanumeric keypad can be used to enter sample ID and user ID to be stored with the measurement reading. The recall key allows the user to review the data along with the date and time that the reading was taken.



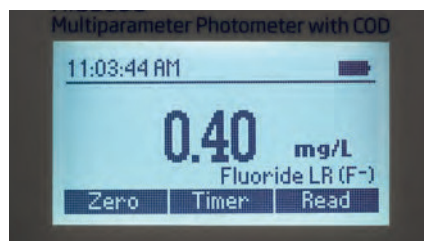
### Data Management

The HI83399 can store up to 1000 photometer and pH electrode readings, which can be logged by pressing the LOG key on the face of the meter. pH readings are logged along with comprehensive GLP (Good Laboratory Practice) information such as date, time, calibration buffers, and electrode offset and slope.

### USB for Data Transfer

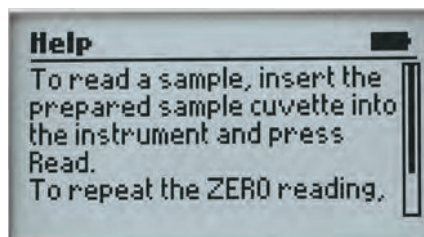
Two USB ports are provided for transferring data. One port allows the data to be transferred to a flash drive while the other USB is used for direct connection to a computer. All data is transferred as a .csv file that can be used with many spreadsheet programs for documentation.

## Display Features



### Backlit Graphic LCD Display

A backlit, graphic LCD display provides an easy to read, user-friendly interface.



### Intuitive Display

With virtual keys, a battery status indicator, and practical error messages, users will find the meter interface intuitive. On-screen guides provide information relating to the current meter operation, and can be used at any stage in the setup or measurement process to show contextual help.

## Specifications

Measurement Channels	5 x optical channels; 1 x digital electrode channel (pH measurement)	
Absorbance	Range	0.000 to 4.000 Abs
	Resolution	0.001 Abs
	Accuracy	±0.003 Abs (at 1.000 Abs)
	Light Source	light-emitting diode
	Bandpass Filter Bandwidth	8 nm
	Bandpass Filter Wavelength Accuracy	± 1.0 nm
	Light Detector	silicon photocell
	Cuvette Type	round, 24.6 mm diameter and 16 mm diameter
pH	Number of Methods	128 max
	Range	-2.00 to 16.00 pH (±1000 mV)*
	Resolution	0.01 pH (0.1 mV)
Temperature	Temperature Compensation	Automatic (-5.0 to 100.0°C; 23.0 to 212.0°F)*
	Range	-20 to 120°C (-4.0 to 248.0 °F)
Additional Specifications	Resolution	0.1 °C (0.1 °F)
	pH electrode	digital pH electrode (not included)
	Logging	1000 readings (mixed photometer and electrode); log on demand with user name and sample ID optional input
	Display	128 x 64 pixel LCD with backlight
	Connectivity	USB-A host for flash drive; micro-USB-B for power and computer connectivity
	Battery Life	3.7VDC Li-polymer rechargeable battery / >500 photometric measurements or 50 hours of continuous pH measurement
	Power Supply	5 VDC USB 2.0 power adapter with USB-A to micro-USB-B cable (included)
	Environment	0 to 50°C (32 to 122°F); 0 to 95% RH, non-condensing
	Dimensions	206 x 177 x 97 mm (8.1 x 7.0 x 3.8 in.)
	Weight	1.0 kg (2.2 lbs.)

Parameter	Range	Resolution	Accuracy (@ 25°C)	LED (▲ nm) with Narrow Band Interference Filter	Method	Reagent Code
Alkalinity	0 to 500 mg/L (as CaCO <sub>3</sub> )	1 mg/L	±5 mg/L ±5% of reading	@ 610 nm	Bromocresol green	<b>HI775-26</b> 25 tests
Alkalinity, Marine	0 to 300 mg/L (as CaCO <sub>3</sub> )	1 mg/L	±5 mg/L ±5% of reading	@ 610 nm	Bromocresol green	<b>HI755-26</b> 25 tests
Aluminum	0.00 to 1.00 mg/L (as Al <sup>3+</sup> )	0.01 mg/L	±0.04 mg/L ±4% of reading	@ 525 nm	aluminon	<b>HI93712-01</b> 100 tests
Ammonia LR	0.00 to 3.00 mg/L (as NH <sub>3</sub> -N)	0.01 mg/L	±0.04 mg/L ±4% of reading	@ 420 nm	Nessler	<b>HI93700-01</b> 100 tests
Ammonia LR (16 mm vial)	0.00 to 3.00 mg/L (as NH <sub>3</sub> -N)	0.01 mg/L	± 0.10 mg/L or ± 5% of reading, whichever is greater	@ 420 nm	Nessler	<b>HI93764A-25</b> 25 tests
Ammonia MR	0.00 to 10.00 mg/L (as NH <sub>3</sub> -N)	0.01 mg/L	±0.05 mg/L ±5% of reading	@ 420 nm	Nessler	<b>HI93715-01</b> 100 tests
Ammonia HR	0.0 to 100.0 mg/L (as NH <sub>3</sub> -N)	0.1 mg/L	±0.5 mg/L ±5% of reading	@ 420 nm	Nessler	<b>HI93733-01</b> 100 tests
Ammonia HR (16 mm vial)	0.0 to 100.0 mg/L (as NH <sub>3</sub> -N)	0.1 mg/L	± 1 mg/L or ± 5% of reading, whichever is greater	@ 420 nm	Nessler	<b>HI93764B-25</b> 25 tests
Bromine	0.00 to 8.00 mg/L (as Br <sub>2</sub> )	0.01 mg/L	±0.08 mg/L ±3% of reading	@ 525 nm	DPD	<b>HI93716-01</b> 100 tests
Calcium	0 to 400 mg/L (as Ca <sup>2+</sup> )	1 mg/L	±10 mg/L ±5% of reading	@ 466 nm	oxalate	<b>HI93751-01</b> 50 tests
Calcium, Marine	200 to 600 mg/L (as Ca <sup>2+</sup> )	1 mg/L	±6% of reading	@ 610 nm	zincon	<b>HI758-26</b> 25 tests
Chloride	0.0 to 20.0 mg/L (as Cl <sup>-</sup> )	0.1 mg/L	±0.5 mg/L ±6% of reading	@ 466 nm	mercury (II) thiocyanate	<b>HI93753-01</b> 100 tests
Chlorine Dioxide	0.00 to 2.00 mg/L (as ClO <sub>2</sub> )	0.01 mg/L	±0.10 mg/L ±5% of reading	@ 575 nm	chlorophenol red	<b>HI93738-01</b> 100 tests
Chlorine Dioxide, Rapid	0.00 to 2.00 mg/L (as ClO <sub>2</sub> )	0.01 mg/L	±0.10 mg/L ±5% of reading	@ 525 nm	DPD	<b>HI96779-01</b> 100 tests
Chlorine, Free	0.00 to 5.00 mg/L (as Cl <sub>2</sub> )	0.01 mg/L	±0.03 mg/L ±3% of reading	@ 525 nm	DPD	<b>HI93701-01</b> 100 tests
Chlorine, Free ULR	0.000 to 0.500 mg/L (as Cl <sub>2</sub> )	0.001 mg/L	±0.020 mg/L ±3% of reading	@ 525 nm	DPD	<b>HI95762-01</b> 100 tests
Chlorine, Total	0.00 to 5.00 mg/L (as Cl <sup>-</sup> )	0.01 mg/L	±0.03 mg/L ±3% of reading	@ 525 nm	DPD	<b>HI93711-01</b> 100 tests
Chlorine, Total ULR	0.000 to 0.500 mg/L (as Cl <sub>2</sub> )	0.001 mg/L	±0.020 mg/L ±3% of reading	@ 525 nm	DPD	<b>HI95761-01</b> 100 tests
Chlorine, Total UHR	0 to 500 mg/L (as Cl <sub>2</sub> )	1 mg/L	±3 mg/L ±3% of reading	@ 525 nm	iodometric	<b>HI95771-01</b> 100 tests
Chromium(VI) LR	0 to 300 µg/L (as Cr <sup>6+</sup> )	1 µg/L	±10 µg/L ±4% of reading	@ 525 nm	diphenylcarbohydrazide	<b>HI93749-01</b> 100 tests
Chromium(VI) HR	0 to 1000 µg/L (as Cr <sup>6+</sup> )	1 µg/L	±5 µg/L ±4% of reading	@ 525 nm	diphenylcarbohydrazide	<b>HI93723-01</b> 100 tests
Chromium, Total and VI (16 mm vial)	0 - 1000 µg/L (as Cr)	1 µg/L	±10 µg/L ±3% of reading	@ 525 nm	diphenylcarbohydrazide	<b>HI96781-25</b> 25 tests
COD LR (16 mm vial)*	0 to 150 mg/L (as O <sub>2</sub> )	1 mg/L	±5 mg/L or ±4% of reading @ 25°C, whichever is greater	@ 420 nm	dichromate ISO dichromate EPA mercury-free dichromate	<b>HI93754A-25</b> 24 tests <b>HI93754D-25</b> 24 tests <b>HI93754F-25</b> 24 tests
			±15 mg/L or ±4% of reading @ 25°C, whichever is greater	@ 610 nm	dichromate ISO dichromate EPA mercury-free dichromate	<b>HI93754B-25</b> 24 tests <b>HI93754E-25</b> 24 tests <b>HI93754G-25</b> 24 tests
			±150 mg/L or ±2% of reading @ 25°C, whichever is greater	@ 610 nm	dichromate	<b>HI93754C-25</b> 24 tests
COD HR (16 mm vial)*	0 to 15000 mg/L (as O <sub>2</sub> )	1 mg/L	±0.5 mg/L ±3% of reading	@ 610 nm	dichromate	<b>HI93754J-25</b> 24 tests
COD UHR (16 mm vial)	0.0 to 60.0 g/L (as O <sub>2</sub> )	0.1 g/L	±10 PCU ±5% of reading	@ 420 nm	colorimetric platinum cobalt	
Color of Water	0 to 500 PCU (Platinum Cobalt Units)	1 PCU	±10 PCU ±5% of reading	@ 420 nm	colorimetric platinum cobalt	
Copper LR	0.000 to 1.500 mg/L (as Cu <sup>2+</sup> )	0.001 mg/L	±0.010 mg/L ±5% of reading	@ 575 nm	bicinchoninate	<b>HI95747-01</b> 100 tests
Copper HR	0.00 to 5.00 mg/L (as Cu <sup>2+</sup> )	0.01 mg/L	±0.02 mg/L ±4% of reading	@ 575 nm	bicinchoninate	<b>HI93702-01</b> 100 tests
Cyanuric Acid	0 to 80 mg/L (as CYA)	1 mg/L	±1 mg/L ±15% of reading	@ 525 nm	turbidimetric	<b>HI93722-01</b> 100 tests
Fluoride LR	0.00 to 2.00 mg/L (as F <sup>-</sup> )	0.01 mg/L	±0.03 mg/L ±3% of reading	@ 575 nm	SPADNS	<b>HI93729-01</b> 100 tests
Fluoride HR	0.0 to 20.0 mg/L (as F <sup>-</sup> )	0.1 mg/L	±0.5 mg/L ±3% of reading	@ 575 nm	SPADNS	<b>HI93739-01</b> 100 tests
Hardness, Calcium	0.00 to 2.70 mg/L (as CaCO <sub>3</sub> )	0.01 mg/L	±0.11 mg/L ±5% of reading	@ 525 nm	calmagite	<b>HI93720-01</b> 100 tests

\*COD Rapid Method available.

Parameter	Range	Resolution	Accuracy (@ 25°C)	LED (▲ nm) with Narrow Band Interference Filter	Method	Reagent Code
Hardness, Magnesium	0.00 to 2.00 mg/L (ppm) (as CaCO <sub>3</sub> )	0.01 mg/L	±0.11 mg/L ±5% of reading	@ 525 nm	EDTA	<b>HI93719-01</b> 100 tests
Hardness, Total LR	0 to 250 mg/L (as CaCO <sub>3</sub> )	1 mg/L	±5 mg/L ±4% of reading	@ 466 nm	EPA 130.1	<b>HI93735-00</b> 100 tests
Hardness, Total MR	200 to 500 mg/L (as CaCO <sub>3</sub> )	1 mg/L	±7 mg/L ±3% of reading	@ 466 nm	EPA 130.1	<b>HI93735-01</b> 100 tests
Hardness, Total HR	400 to 750 mg/L (as CaCO <sub>3</sub> )	1 mg/L	±10 mg/L ±2% of reading	@ 466 nm	EPA 130.1	<b>HI93735-02</b> 100 tests
Hydrazine	0 to 400 µg/L (as N <sub>2</sub> H <sub>4</sub> )	1 µg/L	±4% of full scale reading	@ 466 nm	p-Dimethylaminobenzaldehyde	<b>HI93704-01</b> 100 tests
Iodine	0.0 to 12.5 mg/L (as I <sub>2</sub> )	0.1 mg/L	±0.1 mg/L ±5% of reading	@ 525 nm	DPD	<b>HI93718-01</b> 100 tests
Iron (II) (ferrous)	0.00 to 6.00 mg/L Fe <sup>2+</sup>	0.01 mg/L	±0.10 mg/L ±2% of reading	@ 525 nm	phenanthroline	<b>HI96776-01</b> 100 tests
Iron (II)/(III) (ferrous and ferric)	0.00 to 6.00 mg/L Fe	0.01 mg/L	±0.10 mg/L ±2% of reading	@ 525 nm	phenanthroline	<b>HI96777-01</b> 100 tests
Iron LR	0.000 to 1.600 mg/L (as Fe)	0.001 mg/L	±0.010 mg/L ±8% of reading	@ 575 nm	TPTZ	<b>HI93746-01</b> 50 tests
Iron HR	0.00 to 5.00 mg/L (as Fe)	0.01 mg/L	±0.04 mg/L ±2% of reading	@ 525 nm	phenanthroline	<b>HI93721-01</b> 100 tests
Iron, Total (16 mm vial)	0.00 to 7.00 mg/L (as Fe)	0.01 mg/L	±0.20 mg/L or ± 3%, whichever is greater	@525 nm	phenanthroline	<b>HI96778-25</b> 25 tests
Magnesium	0 to 150 mg/L (as Mg <sup>2+</sup> )	1 mg/L	±5 mg/L ±3% of reading	@ 466 nm	calmagite	<b>HI937520-01</b> 50 tests
Manganese LR	0 to 300 µg/L (as Mn)	1 µg/L	±10 µg/L ±3% of reading	@ 575 nm	PAN	<b>HI93748-01</b> 50 tests
Manganese HR	0.0 to 20.0 mg/L (as Mn)	0.1 mg/L	±0.2 mg/L ±3% of reading	@ 525 nm	periodate	<b>HI93709-01</b> 100 tests
Molybdenum	0.0 to 40.0 µg/L (as Mo <sup>6+</sup> )	0.1 µg/L	±0.3 mg/L ±5% of reading	@ 420 nm	mercaptopoacetic acid	<b>HI93730-01</b> 100 tests
Nickel LR	0.000 to 1.000 mg/L (as Ni)	0.001 mg/L	±0.010 mg/L ±7% of reading	@ 575 nm	PAN	<b>HI93740-01</b> 50 tests
Nickel HR	0.00 to 7.00 g/L (as Ni)	0.01 g/L	±0.07g/L ±4% of reading	@ 575 nm	photometric	<b>HI93726-01</b> 100 tests
Nitrate	0.0 to 30.0 mg/L (as NO <sub>3</sub> <sup>-</sup> N)	0.1 mg/L	±0.5 mg/L ±10% of reading	@ 525 nm	cadmium reduction	<b>HI93728-01</b> 100 tests
Nitrate (16 mm vial)	0.0 to 30.0 mg/L Nitrate (as NO <sub>3</sub> <sup>-</sup> N)	0.1 mg/L	±1.0 mg/L or ±3% of reading, whichever is greater	@ 420 nm	chromotropic acid	<b>HI93766-50</b> 50 tests
Nitrite ULR, Marine	0 to 200 µg/L (as NO <sub>2</sub> <sup>-</sup> N)	1 µg/L	±10 µg/L ±4% of reading	@ 466 nm	diazotization	<b>HI764-25</b> 25 tests
Nitrite LR	0 to 600 µg/L (as NO <sub>2</sub> <sup>-</sup> N)	1 µg/L	±20 µg/L ±4% of reading	@ 466 nm	diazotization	<b>HI93707-01</b> 100 tests
Nitrite LR (16 mm vial)	0 to 600 µg/L (as NO <sub>2</sub> <sup>-</sup> N)	1 µg/L	±10 µg/L ±3% of reading	@ 525 nm	diazotization	<b>HI96783-25</b> 49 tests
Nitrite MR (16 mm vial)	0.00 to 6.00 mg/L (as NO <sub>2</sub> <sup>-</sup> N)	0.01 mg/L	±0.10 mg/L ±3% of reading	@ 525 nm	diazotization	<b>HI96784-25</b> 49 tests
Nitrite HR	0 to 150 mg/L (as NO <sub>2</sub> <sup>-</sup> N)	1 mg/L	±4 mg/L ±4% of reading	@ 575 nm	ferrous sulfate	<b>HI93708-01</b> 100 tests
Nitrogen, Total LR (16 mm vial)	0.0 to 25.0 mg/L (as NO <sub>3</sub> <sup>-</sup> N)	0.1 mg/L	±1.0 mg/L or ±5% of reading, whichever is greater	@ 420 nm	chromotropic acid	<b>HI93767A-50</b> 50 tests
Nitrogen, Total HR (16 mm vial)	0 to 150 mg/L (as N)	1 mg/L	±3 mg/L or ±4% of reading, whichever is greater	@ 420 nm	chromotropic acid	<b>HI93767B-50</b> 50 tests
Oxygen, Dissolved	0.0 to 10.0 mg/L (as O <sub>2</sub> )	0.1 mg/L	±0.4 mg/L ±3% of reading	@ 420 nm	Winkler	<b>HI93732-01</b> 100 tests
Oxygen Scavengers	0.00 to 1.50 mg/L (as Carbohydrazide)	0.01 mg/L	±0.02 µg/L ±3% of reading	@ 575 nm	iron reduction	<b>HI96773-01</b> 100 tests
Oxygen Scavengers	0 to 1000 µg/L (as DEHA)	1 µg/L	±5 µg/L ±5% of reading	@ 575 nm	iron reduction	<b>HI96773-01</b> 100 tests
Oxygen Scavengers	0.00 to 2.50 mg/L (as Hydroquinone)	0.01 mg/L	±0.04 µg/L ±3% of reading	@ 575 nm	iron reduction	<b>HI96773-01</b> 100 tests
Oxygen Scavengers	0.00 to 4.50 mg/L (as Iso-ascorbic acid)	0.01 mg/L	±0.03 µg/L ±3% of reading	@ 575 nm	iron reduction	<b>HI96773-01</b> 100 tests
Ozone	0.00 to 2.00 mg/L (as O <sub>3</sub> )	0.01 mg/L	±0.02 mg/L ±3% of reading	@ 525 nm	DPD	<b>HI93757-01</b> 100 tests
pH	6.5 to 8.5 pH	0.1 pH	±0.1 pH	@ 525 nm	phenol red	<b>HI93710-01</b> 100 tests
Phosphate ULR, Marine	0 to 200 µg/L (as P)	1 µg/L	±5 µg/L ±5% of reading	@ 610 nm	ascorbic acid	<b>HI774-25</b> 25 tests
Phosphate LR	0.00 to 2.50 mg/L (ppm)	0.01 mg/L	±0.04 mg/L ±4% of reading	@ 610 nm	ascorbic acid	<b>HI93713-01</b> 100 tests
Phosphate HR	0.0 to 30.0 mg/L (as PO <sub>4</sub> <sup>3-</sup> )	0.1 mg/L	±1 mg/L ±4% of reading	@ 525 nm	amino acid	<b>HI93717-01</b> 100 tests
Phosphorus Reactive LR (16 mm vial)	0.00 to 1.60 mg/L (as P)	0.01 mg/L	±0.05 mg/L or ±4% of reading, whichever is greater	@ 610 nm	ascorbic acid	<b>HI93758A-50</b> 50 tests
Phosphorus Reactive HR (16 mm vial)	0.0 to 32.6 mg/L (as P)	0.1 mg/L	±0.5 mg/L or ±4% of reading, whichever is greater	@ 420 nm	vanadomolybdophosphoric acid	<b>HI93763A-50</b> 49 tests
Phosphorus Acid Hydrolyzable (16 mm vial)	0 to 1.6 mg/L (ppm) (as P)	0.1 mg/L	±0.05 mg/L or ±5% of reading, whichever is greater	@ 610 nm	ascorbic acid	<b>HI93758B-50</b> 50 tests
Phosphorus, Total LR (16 mm vial)	0.00 to 1.15 mg/L (as P)	0.01 mg/L	±0.05 mg/L or ±6% of reading, whichever is greater	@ 610 nm	ascorbic acid	<b>HI93758C-50</b> 50 tests
Phosphorus, Total HR (16 mm vial)	0.0 to 32.6 mg/L (as P)	0.1 mg/L	±0.5 mg/L or ±5% of reading, whichever is greater	@ 420 nm	vanadomolybdophosphoric acid	<b>HI93763B-50</b> 49 tests
Potassium	0.0 to 20.0 mg/L (as K)	0.1 mg/L	±3.0 mg/L ±7% of reading	@ 466 nm	turbidimetric tetraphenylborate	<b>HI93750-01</b> 100 tests
Silica LR	0.00 to 2.00 mg/L (as SiO <sub>2</sub> )	0.01 mg/L	±0.03 mg/L ±3% of reading	@ 610 nm	heteropoly blue	<b>HI93705-01</b> 100 tests
Silica HR	0 to 200 mg/L (as SiO <sub>2</sub> )	1 mg/L	±1 mg/L ±5% of reading	@ 466 nm	molybdosilicate	<b>HI96770-01</b> 100 tests
Silver	0.000 to 1.000 mg/L (as Ag)	0.001 mg/L	±0.020 mg/L ±5% of reading	@ 575 nm	PAN	<b>HI93737-01</b> 50 tests
Sulfate	0 to 150 mg/L (as SO <sub>4</sub> <sup>2-</sup> )	1 mg/L	±5 mg/L ±3% of reading	@ 466 nm	turbidimetric	<b>HI93751-01</b> 100 tests
Surfactants, Anionic (16 mm vial)	0.00 to 3.50 mg/L (as SDBS)	0.01 mg/L	±0.04 mg/L ±3% of reading	@ 610 nm	methylene blue	<b>HI95769-01</b> 100 tests
Surfactants Nonionic (16 mm vial)	0.00 to 3.50 mg/L (as SDBS)	0.01 mg/L	±0.10 mg/L ±5% of reading	@ 610 nm	methylene blue	<b>HI96782-25</b> 25 tests
Surfactants Nonionic (16 mm vial)	0.00 to 6.00 mg/L (as TRITON X-100)	0.01 mg/L	±0.10 mg/L ±5% of reading	@ 610 nm	TBPE	<b>HI96780-25</b> 24 tests
Zinc	0.00 to 3.00 mg/L (as Zn)	0.01 mg/L	±0.03 mg/L ±3% of reading	@ 575 nm	zincon	<b>HI93731-01</b> 100 tests

## Ordering Information

**HI83399-01** (115V) and **HI83399-02** (230V) is supplied with sample cuvettes and caps (4 ea.), digestion vials (6), vial adapter, cloth for wiping cuvettes, USB to micro USB cable connector, power adapter, instrument quality certificate, and instruction manual.

## Standards

**HI83399-11** CAL Check Cuvette Kit for HI83399