Multiparameter Photometers

with Advanced Optics and Digital pH Electrode Input

HANNA instruments®

HI83300 Family

Multiparameter Photometers

with Digital pH Electrode Input

The HI83300 family of multiparameter photometers features seven models to cover a wide variety of applications. These meters are compact and versatile making them ideal for both benchtop or portable operation.

- 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.
- Up to 73 different programmed methods measuring 40 key water and wastewater quality parameters.
- Absorbance mode
  - Absorbance measurement mode for performance verification and can also be used to plot a custom concentration versus absorbance curve useful for user-supplied chemistry and for teaching students about photometry.
- High performance pH meter that uses advanced digital pH/temperature electrodes.

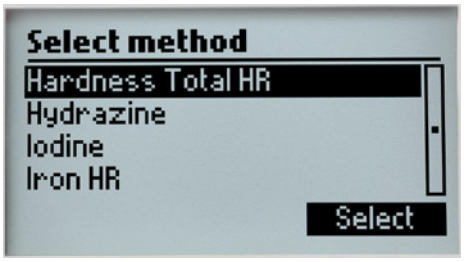
Nine Models Available

HI83300	Multiparameter Photometer
HI83399	Multiparameter Photometer with COD
HI83303	Aquaculture Photometer
HI83305	Boiler and Cooling Tower Photometer
HI83306	Environmental Analysis Photometer
HI83308	Water Conditioning Photometer
HI83314	Wastewater Treatment Photometer
HI83325	Nutrient Analysis Photometer
HI83326	Pool and Spa Photometer

Feature Overview

- 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
- 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
- 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 include no cap, high zero, and standard too low
  - pH calibration messages include clean electrode, check buffer and check probe

Photometer Capabilities

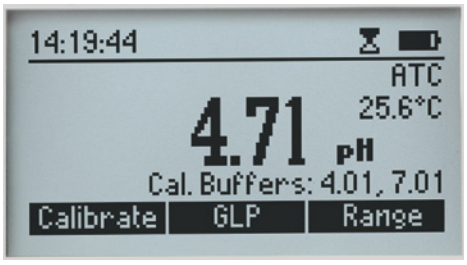


Concentration Measurement Function

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.

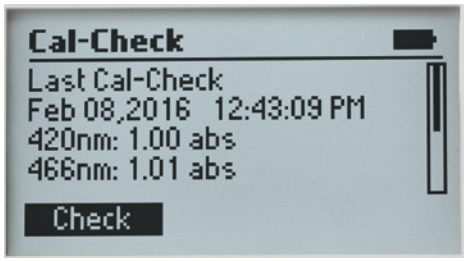
Built-in Reaction Timer

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.



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.

Large Cuvettes

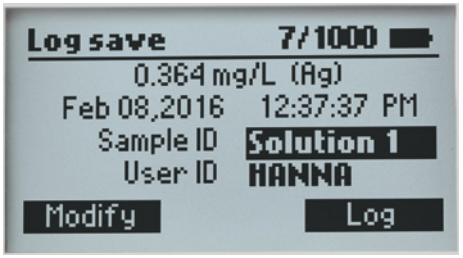
The sample cell of these meters fits a round, glass cuvette with a 25 mm path length. The relatively long path length of the sample cuvette allows the light to pass through more of the sample solution, ensuring accurate measurements even in low absorbance samples. This cuvette size also provides a larger 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.

Digestion Vial Adapter

A digestion vial adapter is supplied with photometers programmed with digestion parameters. The adapter is used with reagents packaged in 16mm digestion vials, including COD and various forms of Nitrogen and Phosphorous.

Data Management Capabilities



Data Management

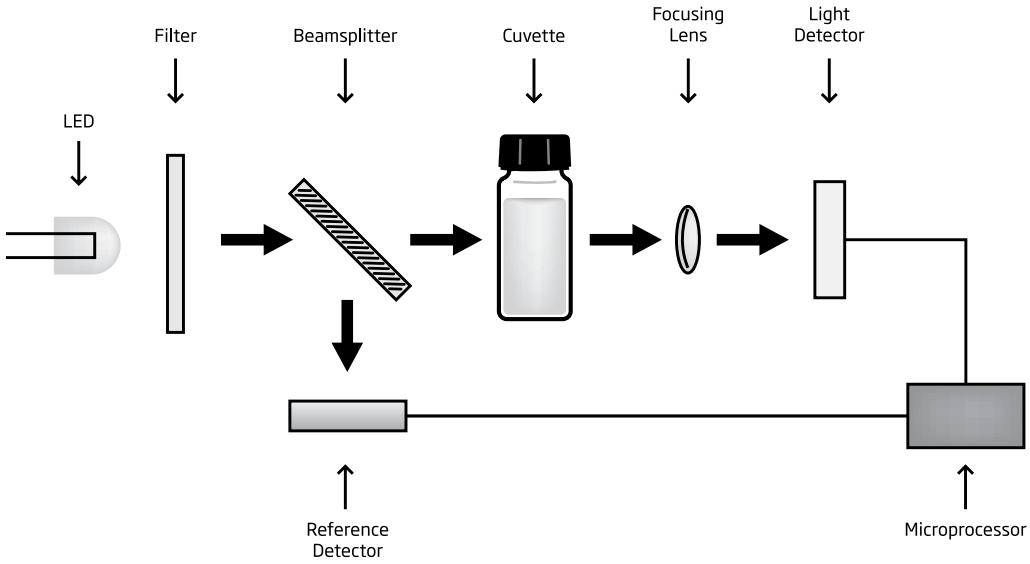
The HI83300 family can store up to 1000 photometer and pH electrode readings, which can be logged by pressing the LOG key on the face of the meter. pH readings are logged along with comprehensive GLP (Good Laboratory Practice) information such as date, time, calibration buffers, and electrode offset and slope.

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.

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.



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 an electronic stability.

Quality Narrow Band Interference Filters

The narrow band interference filter not only ensures greater wavelength accuracy (±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.

Reference Detector for a Stable Light Source

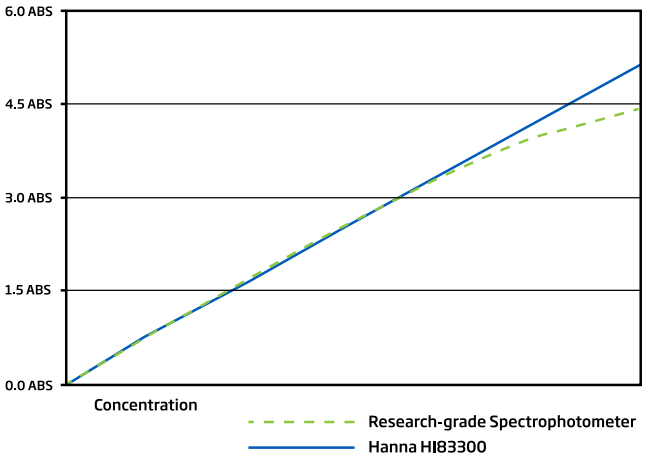
A beam splitter is used as part of the internal reference system of the HI83300 photometer. The reference detector compensates for any drift due to power fluctuations or ambient temperature changes. Now you can rely on a stable source of light.

Large Cuvette Size

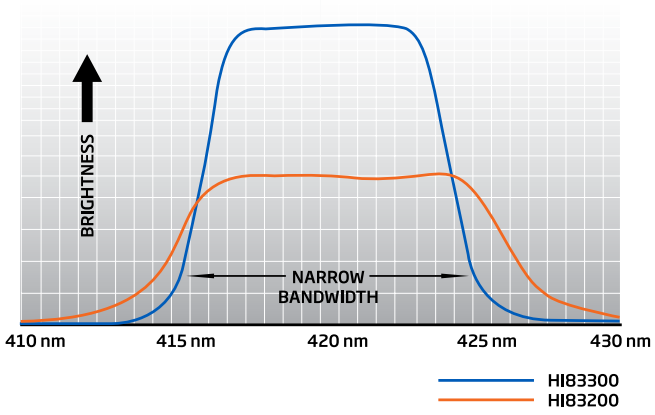
The sample cell of the HI83300 fits a round, glass cuvette with a 25 mm path length. Along with the advanced optical components, the larger size of the cuvette greatly reduces errors in rotation from the indexing mark of the cuvettes. The relatively long path length of the sample cuvette allows the light 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.



- Better linearity than research-grade spectrophotometers



- Improved optical filters – higher wavelength accuracy and light throughput

Parameter	Range	Method	HI83300	HI83399	HI83303	HI83305	HI83306	HI83308	HI83314	HI83325	HI83326
Alkalinity	0 to 500 mg/L (as $CaCO_3$)	Colorimetric method	•	•	•						•
Alkalinity, Marine	0 to 300 mg/L (as $CaCO_3$)	Colorimetric method	•	•	•						
Aluminum	0.00 to 1.00 mg/L (as Al^{3+})	aluminon	•	•		•					
Ammonia Low Range	0.00 to 3.00 mg/L (as NH_3-N)	Nessler	•	•	•	•	•	•	•	•	
Ammonia Low Range (16 mm vial)	0.00 to 3.00 mg/L (as NH_3-N)	Nessler		•					•		
Ammonia Medium Range	0.00 to 10.00 mg/L (as NH_3-N)	Nessler	•	•	•	•	•	•	•	•	
Ammonia High Range	0.0 to 100.0 mg/L (as NH_3-N)	Nessler	•	•	•	•	•	•	•	•	
Ammonia High Range (16 mm vial)	0.0 to 100.0 mg/L (as NH_3-N)	Nessler		•					•		
Bromine	0.00 to 8.00 mg/L (as Br_2)	DPD	•	•		•					•
Calcium	0 to 400 mg/L (as Ca^{2+})	oxalate	•	•	•					•	
Calcium, Marine	200 to 600 mg/L (as Ca^{2+})	zincon	•	•	•						
Chloride	0.0 to 20.0 mg/L (as Cl^-)	mercury (II) thiocyanate	•	•							
Chlorine Dioxide	0.00 to 2.00 mg/L (as ClO_2)	chlorophenol red	•	•		•					
Chlorine, Free	0.00 to 5.00 mg/L (as Cl_2)	DPD	•	•	•	•	•	•	•		•
Chlorine, Free Ultra Low Range	0.000 to 0.500 mg/L (as Cl_2)	DPD	•	•							
Chlorine, Total	0.00 to 5.00 mg/L (as Cl^-)	DPD	•	•	•	•	•	•	•		•
Chlorine, Total Ultra Low Range	0.000 to 0.500 mg/L (as Cl_2)	DPD	•	•							
Chlorine, Total Ultra High Range	0 to 500 mg/L (as Cl_2)	iodometric	•	•							
Chromium(VI) Low Range	0 to 300 µg/L (as Cr^{6+})	diphenylcarbohydrazide	•	•		•	•				
Chromium(VI) High Range	0 to 1000 µg/L (as Cr^{6+})	diphenylcarbohydrazide	•	•		•	•				
COD Low Range (16 mm vial)	0 to 150 mg/L (as O_2)	dichromate mercury-free		•					•		
COD Medium Range (16 mm vial)	0 to 1500 mg/L (as O_2)	dichromate mercury-free		•					•		
COD HR (16 mm vial)	0 to 15000 mg/L (as O_2)	dichromate		•					•		
Color of Water	0 to 500 PCU (Platinum Cobalt Units)	colorimetric platinum cobalt	•	•			•				
Copper Low Range	0.000 to 1.500 mg/L (as Cu^{2+})	bicinchoninate	•	•	•	•	•	•			
Copper High Range	0.00 to 5.00 mg/L (as Cu^{2+})	bicinchoninate	•	•	•	•	•	•			•
Cyanuric Acid	0 to 80 mg/L (as CYA)	turbidimetric	•	•			•				•
Fluoride Low Range	0.00 to 2.00 mg/L (as F^-)	SPADNS	•	•				•			
Fluoride High Range	0.0 to 20.0 mg/L (as F^-)	SPADNS	•	•							
Hardness, Calcium	0.00 to 2.70 mg/L (as $CaCO_3$)	calmagite	•	•							•
Hardness, Magnesium	0.00 to 2.00 mg/L (ppm) (as $CaCO_3$)	EDTA colorimetric	•	•							
Hardness, Total Low Range	0 to 250 mg/L (as $CaCO_3$)	calmagite	•	•							
Hardness, Total Medium Range	200 to 500 mg/L (as $CaCO_3$)	calmagite	•	•							
Hardness, Total High Range	400 to 750 mg/L (as $CaCO_3$)	calmagite	•	•							
Hydrazine	0 to 400 µg/L (as N_2H_4)	p-Dimethylaminobenzaldehyde	•	•		•					
Iodine	0.0 to 12.5 mg/L (as I_2)	DPD	•	•							
Iron Low Range	0.000 to 1.600 mg/L (as Fe)	TPTZ	•	•		•		•			
Iron High Range	0.00 to 5.00 mg/L (as Fe)	phenanthroline	•	•		•		•			•
Magnesium	0 to 150 mg/L (as Mg^{2+})	calmagite	•	•						•	
Manganese Low Range	0 to 300 µg/L (as Mn)	PAN	•	•				•			
Manganese High Range	0.0 to 20.0 mg/L (as Mn)	periodate	•	•				•			
Molybdenum	0.0 to 40.0 mg/L (as Mo^{6+})	mercaptoacetic acid	•	•		•	•	•			
Nickel Low Range	0.000 to 1.000 mg/L (as Ni)	PAN	•	•			•	•			
Nickel High Range	0.00 to 7.00 g/L (as Ni)	photometric	•	•			•	•			
Nitrate	0.0 to 30.0 mg/L (as NO_3^-- N)	cadmium reduction	•	•	•	•	•	•		•	•
Nitrate (16 mm vial)	0.0 to 30.0 mg/L (as NO_3^-- N)	chromotropic acid		•					•		
Nitrite Ultra Low Range, Marine	0 to 200 µg/L (as NO_2^-- N)	diazotization	•	•	•						
Nitrite Low Range	0 to 600 µg/L (as NO_2^-- N)	diazotization	•	•	•	•			•		
Nitrite High Range	0 to 150 mg/L (as NO_2^-- N)	ferrous sulfate	•	•	•	•	•		•		
Nitrogen, Total Low Range (16 mm vial)	0.0 to 25.0 mg/L (as NO_3^-- N)	chromotropic acid		•					•		
Nitrogen, Total High Range (16 mm vial)	0 to 150 mg/L (as N)	chromotropic acid		•					•		
Oxygen, Dissolved	0.0 to 10.0 mg/L (as O_2)	Winkler	•	•	•	•	•	•			
Oxygen Scavengers	0.00 to 1.50 mg/L (as Carbohydrazide)	iron reduction	•	•		•					
Oxygen Scavengers	0 to 1000 µg/L (as DEHA)	iron reduction	•	•		•					
Oxygen Scavengers	0.00 to 2.50 mg/L (as Hydroquinone)	iron reduction	•	•		•					
Oxygen Scavengers	0.00 to 4.50 mg/L (as Iso-ascorbic acid)	iron reduction	•	•		•					
Ozone	0.00 to 2.00 mg/L (as O_3)	DPD	•	•							•
pH	6.5 to 8.5 pH	phenol red	•	•	•	•	•	•			•
Phosphate Ultra Low Range, Marine	0 to 200 µg/L (as P)	ascorbic acid	•	•	•						
Phosphate Low Range	0.00 to 2.50 mg/L (ppm)	ascorbic acid	•	•	•	•	•	•			•
Phosphate High Range	0.0 to 30.0 mg/L (as PO_4^{3-})	amino acid	•	•	•	•	•	•		•	
Phosphorus Reactive Low Range (16 mm vial)	0.00 to 1.60 mg/L (as P)	ascorbic acid		•					•		
Phosphorus Reactive High Range (16 mm vial)	0.0 to 32.6 mg/L (as P)	vanadomolybdophosphoric acid		•					•		
Phosphorus Acid Hydrolyzable (16 mm vial)	0 to 1.6 mg/L (ppm) (as P)	ascorbic acid		•					•		
Phosphorus, Total Low Range (16 mm vial)	0.00 to 1.15 mg/L (as P)	ascorbic acid		•					•		
Phosphorus, Total High Range (16 mm vial)	0.0 to 32.6 mg/L (as P)	vanadomolybdophosphoric acid		•					•		
Potassium	0.0 to 20.0 mg/L (as K)	turbidimetric tetraphenylborate	•	•						•	
Silica Low Range	0.00 to 2.00 mg/L (as SiO_2)	heteropoly blue	•	•		•	•	•			
Silica High range	0 to 200 mg/L (as SiO_2)	molybdosilicate	•	•		•					
Silver	0.000 to 1.000 mg/L (as Ag)	PAN	•	•			•	•			
Sulfate	0 to 150 mg/L (as SO_4^{2-})	turbidimetric	•	•						•	
Surfactants, Anionic	0.00 to 3.50 mg/L (as SDBS)	methylene blue	•	•							
Zinc	0.00 to 3.00 mg/L (as Zn)	zincon	•	•		•	•	•			

General Specifications for all Models

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
	Number of Methods	128 max
pH	Range	-2.00 to 16.00 pH (±1000 mV)*
	Resolution	0.01 pH (0.1 mV)
	Temperature Compensation	Automatic (-5.0 to 100.0°C; 23.0 to 212.0°F)*
Temperature	Range	-20 to 120°C (-4.0 to 248.0 °F)
	Resolution	0.1 °C (0.1 °F)
Additional Specifications	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	3.7 VDC 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.)

Ordering Information

HI83300-01 (115V) and **HI83300-02** (230V) is supplied with sample cuvettes and caps (4 ea.), cloth for wiping cuvettes, USB to micro USB cable connector, power adapter and instruction manual.

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

HI83303-01 (115V) and **HI83303-02** (230V) is supplied with sample cuvettes and caps (4 ea.), cloth for wiping cuvettes, USB to micro USB cable connector, power adapter and instruction manual.

HI83305-01 (115V) and **HI83305-02** (230V) is supplied with sample cuvettes and caps (4 ea.), cloth for wiping cuvettes, USB to micro USB cable connector, power adapter and instruction manual.

HI83306-01 (115V) and **HI83306-02** (230V) is supplied with sample cuvettes and caps (4 ea.), cloth for wiping cuvettes, USB to micro USB cable connector, power adapter and instruction manual.

HI83308-01 (115V) and **HI83308-02** (230V) is supplied with sample cuvettes and caps (4 ea.), cloth for wiping cuvettes, USB to micro USB cable connector, power adapter and instruction manual.

HI83314-01 (115V) and **HI83314-02** (230V) is supplied with sample cuvettes and caps (4 ea.), cloth for wiping cuvettes, USB to micro USB cable connector, power adapter and instruction manual.

HI83325-01 (115V) and **HI83325-02** (230V) is supplied with sample cuvettes and caps (4 ea.), activated carbon for 50 testst, 2 L demineralizer bottle, 100 mL graduated beaker with caps (10), 3 mL pipette, 60 mL syringe, 5 mL syringe, graduated cylinder, spoon, funnel, paper filters (100), cloth for wiping cuvettes, USB to micro USB cable connector, power adapter, instruction manual and carrying case.

HI83326-01 (115V) and **HI83326-02** (230V) is supplied with sample cuvettes and caps (4 ea.), cloth for wiping cuvettes, USB to micro USB cable connector, power adapter and instruction manual.

Reagents

HI83300-11 CAL Check Cuvette Kit for HI83300
HI83303-11 CAL Check Cuvette Kit for HI83303
HI83305-11 CAL Check Cuvette Kit for HI83305
HI83306-11 CAL Check Cuvette Kit for HI83306
HI83308-11 CAL Check Cuvette Kit for HI83308
HI83314-11 CAL Check Cuvette Kit for HI83314
HI83325-11 CAL Check Cuvette Kit for HI83325
HI83326-11 CAL Check Cuvette Kit for HI83326
HI83399-11 CAL Check Cuvette Kit for HI83399

Accessories

HI83300-100 sample preparation kit consisting of activated carbon for 50 testst, 2 L demineralizer bottle, 100 mL graduated beaker with caps (10), 3 mL pipette, 60 mL syringe, 5 mL syringe, graduated cylinder, spoon, funnel, paper filters (100)

HI72083300 carrying case for HI83300 family
HI76404A electrode holder for HI83300 family
HI11310 digital combination pH electrode
HI75110/230 USB power supply
HI920015 USB to micro USB cable connector
HI731318 cuvette cleaning cloth (4)
HI731331 cuvette (4)
HI731335N caps for cuvette (4)
HI740034P beaker cap for 100 mL plastic beaker (10)
HI740036P beaker, plastic 100 mL (10)
HI740224 plastic beaker 170 mL (6)
HI740225 60 mL graduated syringe
HI740226 5 mL graduated syringe
HI93703-55 activated carbon for 50 tests


HI83300-11

HANNA® instruments

MULTIPHOTOMETERS 3.1, 10/16 PRINTED IN USA

* Limits will be reduced to actual sensor limits

Hanna Instruments reserves the right to change or modify the design and/or specifications of its products at any time without notice.