



HI802
Visible Spectrophotometer
with Method Identification via Barcode Reader



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HI802 iris visible spectrophotometer quickly identifies Hanna Instruments vial methods by reading the barcode on reagent vials across multiple methods that support the use of a single-zero measurement.

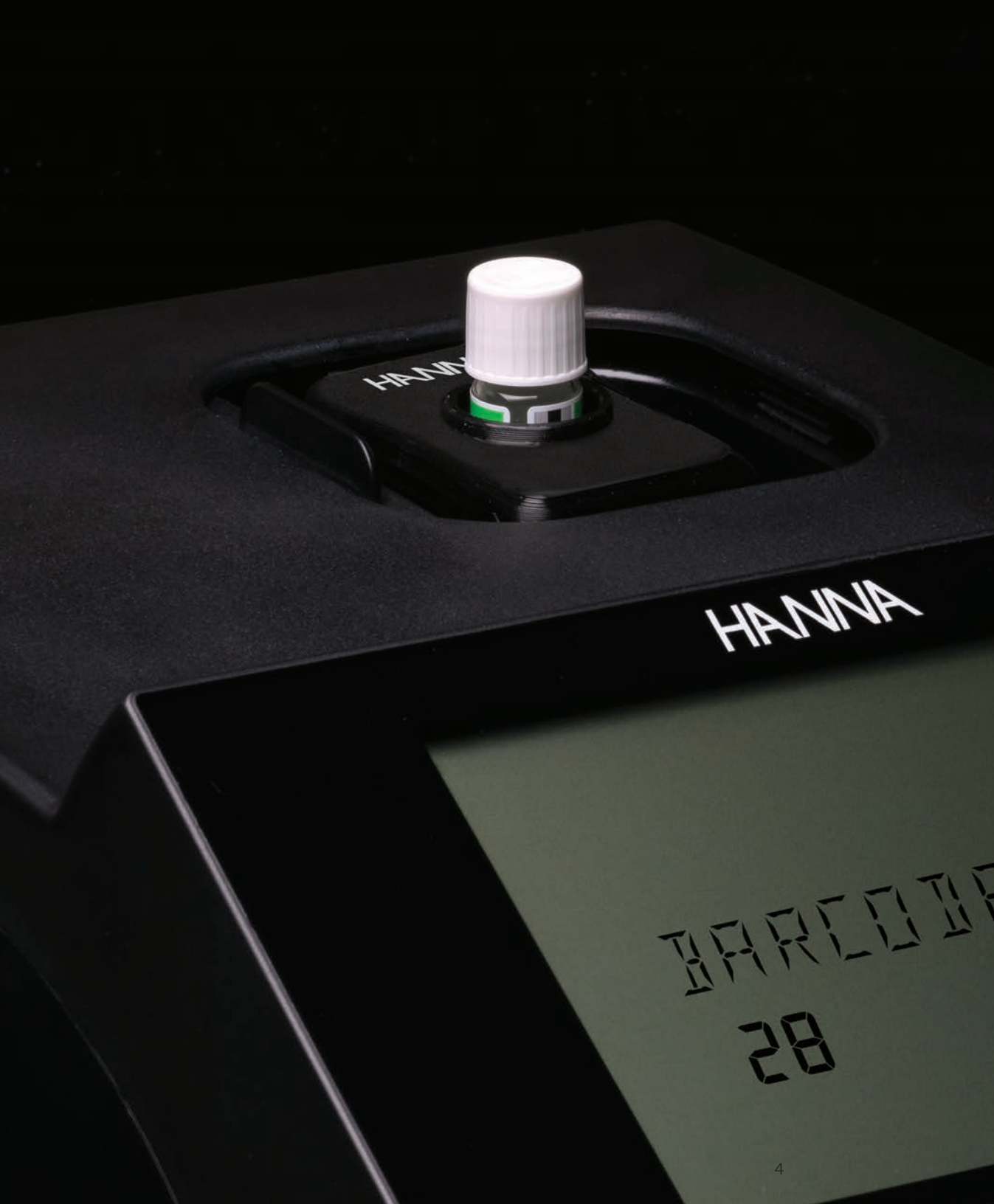
The barcode reader for method identification is removable to allow other methods and cuvette adapters (included) to be used for maximum versatility.

HI802 iris® visible spectrophotometer is portable and allows for measurement in the spectrum of all wavelengths of visible light and not just pre-specified wavelengths.

Spectrophotometers work by isolating light at specific wavelengths from white light. This compact meter incorporates a number of features that facilitate both fantastic performance and exceptional usability.

- Supplied with 103 factory methods
- Create up to 100 user methods
- Automatic method identification of vial samples
- Vial barcode reader
- Shared single-zero measurement across multiple vial methods
- 5 cuvette types (16 mm round, 22 mm round, 13 mm vial, 10 mm square, 50 mm rectangular) with automatic detection
- Data storage for 9999 measurements with ability to auto log results
- Simplified data transfer to a PC or Mac
- Field upgradeable firmware
- Rechargeable battery





Method identification

Vial barcode reader

Automatic method identification of barcoded sample vials is an exciting feature of HI802.

The HI802 visible spectrophotometer scans an inserted barcoded vial and automatically detects both method type and method range, significantly reducing the risk of errors and aiding measurement procedure.

Vial rotation

Vial rotation during measurement allows for method identification and for a number of absorbance readings. The instrument then converts the readings to concentration units and the result is shown on the LCD display. This rotational averaging of signals during measurement (with the lamp on) ensures improved method accuracy.

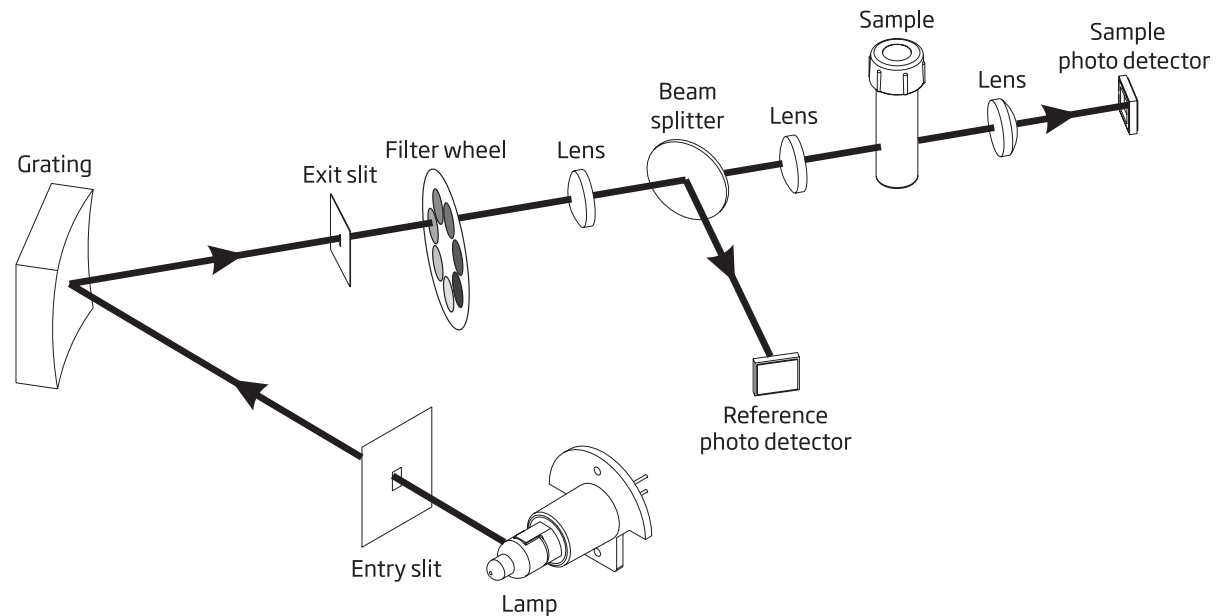
Shared single-zero measurement

Use of a single-zero measurement across multiple vial methods where blank correction is done with DI water. This ensures that sample features, rather than instrument changes, are reflected in the instrument's measurements and contributes to ease of use and stable readings.



Spectral range

The meter features a spectral range of 340nm to 900nm allowing for a wide selection of analytical methods. The flexibility of this range permits compliance with many methods from regulatory organizations and associations for a variety of applications.



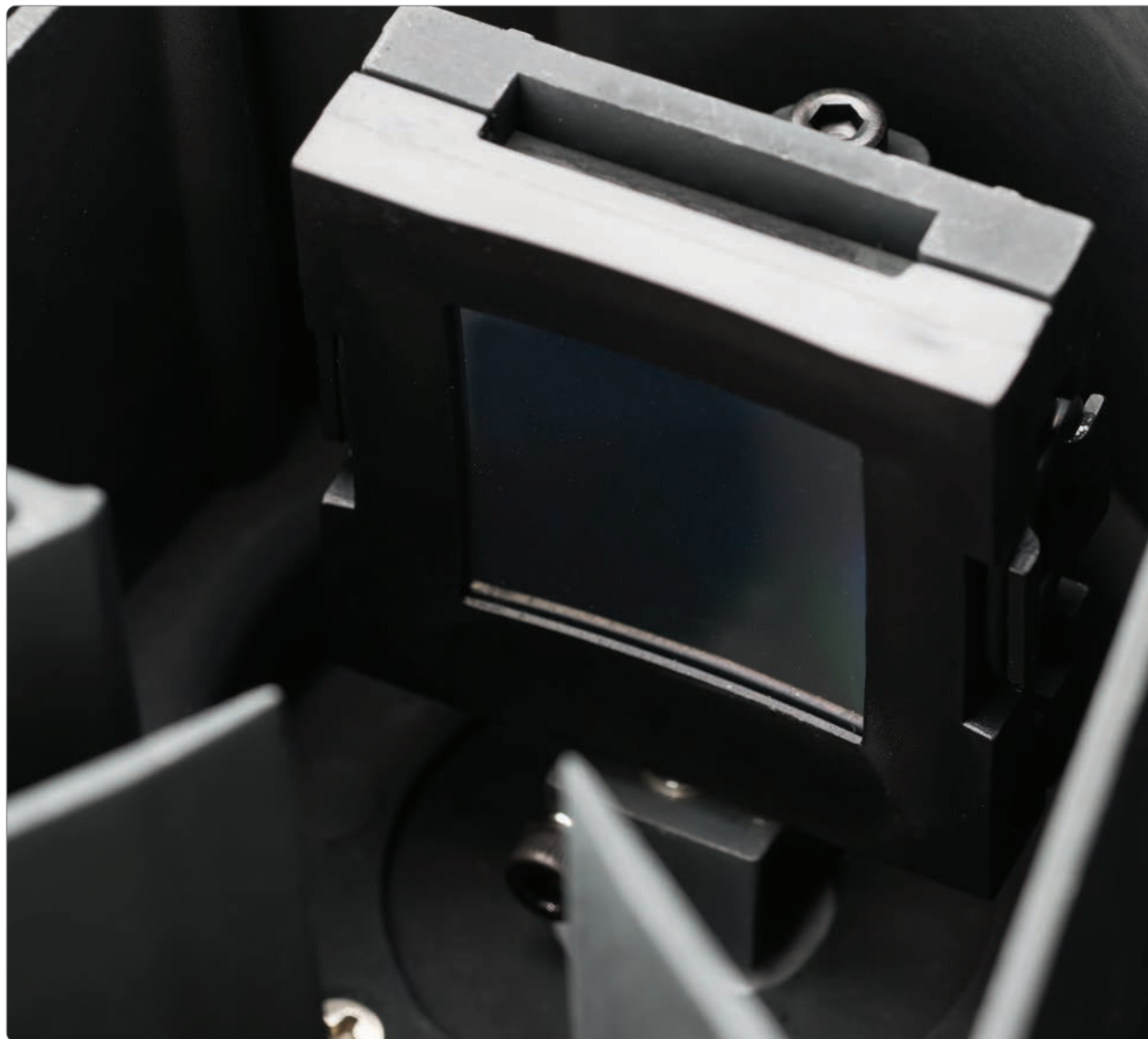
Advanced split-beam optical system

In a spectrophotometer the optical system is the heart of the instrument. Ensuring that the optical system is built with the best design and highest quality materials will guarantee accurate readings and a long life for the meter. When developing this meter our research and development team paid special attention to details and combined many small improvements to a typical spectrophotometer design to create a portable meter with unprecedented performance.



Replaceable tungsten-halogen lamp

To be able to measure in a wide variety of wavelengths a broadband light source is necessary. In the iris® visible spectrophotometer, this is accomplished by a tungsten-halogen lamp. As these lamps do not last indefinitely, it is necessary to change them throughout the life of the meter. The pre-alignment of the lighting fixture guarantees that the bulb is in the same position every time it is changed. This generates peace of mind as there is no need to worry about realigning the light source.



Concave grating

This element of the optical system is what generates the spectrum of light. When the light from the tungsten lamp hits the grating it is met with interference coatings that turn the polychromatic white light into a rainbow. This rainbow contains dispersed light at all wavelengths in the visible spectrum. The rotation of this grating is what allows for a specific wavelength to be selected. This ability is one of the biggest differences between a spectrophotometer and a photometer. The concave grating which accomplishes this is superior to other types of diffraction, such as prisms, as it minimizes stray light generated and has constant bandwidth. It also combines elements of the optical system that would typically be separate, for example if a flat grating was used a concave mirror would need to be added in order to refocus the light. The combination of these two pieces creates greater efficiency and a smaller optical system to yield a more compact portable meter.

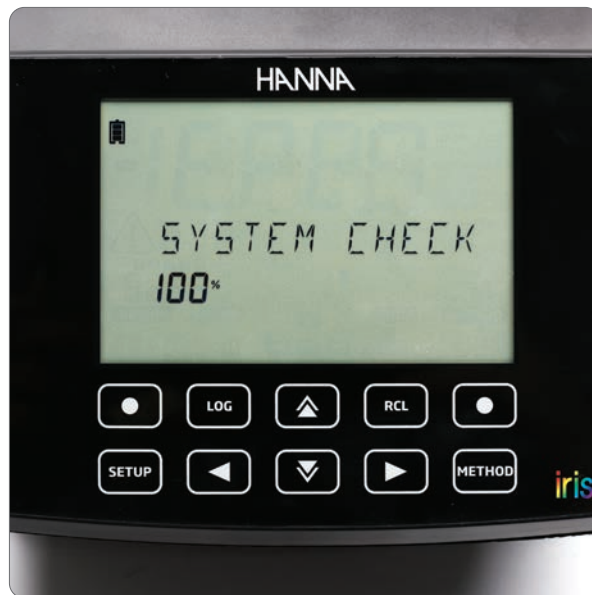


Beam splitter

The beam splitter is added to the optical system for use with a reference detector to ensure that the measurement compensates for any drift in the light source. It works by splitting the light emitted by the tungsten lamp into two beams and sending one beam of light to the reference detector that measures intensity. If there are any fluctuations in the light source the meter detects this and compensates through a mathematical calculation. The reference detector also saves battery life and leads to improved speed of the meter as the lamp doesn't have to warm up prior to use.

Narrow bandwidth and high resolution

Having a small bandwidth is necessary to accurately measure narrow peaks. The iris® visible spectrophotometer maintains a narrow bandwidth of 5 nm resulting in good spectral resolution. This leads to accurate measurement of sharp, narrow absorbance peaks. Additionally, the high resolution of 1 nm generates greater sensitivity as the wavelength is closer to where the sample absorbs the most light.



System check

Upon turning on the meter a performance check occurs to confirm that the light source is working properly and to calibrate the position of the grating. The grating calibration works by scanning for the "zero order" light reflecting off the grating. If any mechanical problems are present, the meter will display an alert. This feature establishes confidence in measurements knowing that the meter is always working properly without needing to run any additional tests.

Low stray light

A common problem in spectrophotometers is stray light. Stray light can be light which is outside the wavelength the meter is measuring or also light at the proper wavelength but from outside the meter. This leads to inaccurate readings as this light would not be absorbed by the sample but would still be detected by the meter. This is a problem that is typically hard to control. Due to the design of the optical system we are able to keep this potential issue to a minimum to improve the linearity and accuracy of readings.



Universal cuvette holder and auto-recognition

The built-in cuvette holder holds both 22 mm round cuvettes and rectangular cuvettes with a 5 cm path length. Adapters for the cuvette holder are available to hold other 13 and 16 mm round cuvettes, and 10 mm square cuvettes including the 13 mm vial adapter with barcode reader. Rectangular cuvettes have longer path lengths which result in higher sensitivity in readings of low absorbance samples. Additionally, the meter permits the selection of the size of the cuvette used in custom user methods from the available sizes. For all methods, the programmed cuvette size is displayed on the screen to assure that the proper path length is being used by the meter when calculating measurements.

User interface

No one likes to work with difficult equipment, which is why we have worked hard to create an interface that makes the meter's operation seamless. The intuitive menu design and large LCD screen all make working with the meter a breeze. Get ready for your new favorite piece of lab equipment.

Favorite methods

Always have your most frequently used methods readily available with the favorite methods feature. Directly from the home screen is access to user-programmed favorite methods, saving time.

Large high-contrast custom LCD display

With a 6" display, the screen is large and easy to read. The high contrast makes every character on the display stand out even during outdoor use. The wide viewing angle allows for measurements to be seen from far away, so while working around the lab it is not necessary to hover over the meter to see the measurements.

Capacitive touchpad (for glove use)

Navigating the menus and using the meter is effortless with the capacitive touchpad. Featuring dedicated buttons specifically for setup, logging data, recalling data, and methods allows for quick and easy access to these functions. There is a key beep feature that can be enabled or disabled, for audible feedback that the key was pressed.

Customized methods

The HI802 intuitive user interface guides users step-by-step through the process of creating custom methods i.e.: naming your method, setting the measurement wavelengths, creating reaction timers, and calibrating the method. Up to 10 points can be used to calibrate methods.

- Step-by-step method creation
- Up to 10 calibration points
- Flexible calculations for multi wavelength methods



Pre-programmed methods

Programmed in the meter are more than 100 commonly used methods for chemical analysis. Methods can easily be updated by transferring the file from a computer to the meter or by a flash drive. Up to 150 factory methods can be saved in the meter and some chemical parameters have the option to switch between different chemical forms. Finding the product codes to order additional reagents is easy as the meter provides the appropriate reagent codes for each programmed method.



User methods

The ability to program up to 100 personal methods into the meter creates both versatility and customization. Methods can include up to 10 calibration points, 5 different wavelengths (which can be used simultaneously), and permits the use of 5 reaction timers. These features allow for many variations to be implemented into methods. Compared to a photometer there is no longer a limitation by factory methods. If a certain parameter is not offered or a modification to a pre-programmed method is required, the meter can be customized to suit your needs.

General features

When choosing a piece of equipment making sure the product has all required features for the intended purposes is critical. When building the iris® we included as many features as we could to aid in making this meter versatile and convenient. From power features such as long battery life and easy data logging and transfer, we have pushed the limits on seemingly basic features to make laboratory work as easy as possible.



Data logging and transfer

The HI802 can store up to 9999 measurements in memory. Transferring data from a meter should always be simple and straightforward. At any time data can be transferred to a PC or Mac as either a CSV or PDF file. No software is required, simply plug in a flash drive or plug it into a computer and export the data. Additionally, a meter ID and a sample ID can be programmed to be saved along with logged measurements. With technical equipment, wide-spread connection compatibility can often be an issue, which is why the iris visible spectrophotometer features USB ports for both flash drive and a direct computer connection. Connectivity with a USB-A port to a flash drive can be used to transfer logged measurements from the meter and also to transfer method updates onto the meter. The USB-B port is used for a direct connection to a computer specifically for transferring logged data.



Battery operated

The meter features a rechargeable lithium ion battery that lasts for approximately 3,000 measurements (excl. vial rotation). Lasting well over a day of use in the field there is no need to worry about the battery life while out working without a power supply. The meter can be quickly recharged with a dedicated fast charging adapter.

Parameter	Range	Resolution	Accuracy	Wavelength	Cuvette Type	Method	Method ID	Reagent Code
Alkalinity	0 to 500 mg/L (as CaCO ₃)	1 mg/L	±5 mg/L ±5% of reading at 25 °C	610 nm	22 mm diameter	Bromocresol Green	#001	HI775-26 Reagents for 25 tests
Alkalinity, Marine	0 to 300 mg/L (as CaCO ₃)	1 mg/L	±5 mg/L ±5% of reading at 25 °C	610 nm	22 mm diameter	Bromocresol Green	#002	HI755-26 Reagents for 25 tests
Aluminum	0.00 to 1.00 mg/L (as Al ³⁺)	0.01 mg/L	±0.04 mg/L ±4% of reading at 25 °C	530 nm	22 mm diameter	Adaptation of the Aluminon Method	#003	HI93712-01 Reagents for 100 tests HI93712-03 Reagents for 300 tests
Ammonia Low Range	0.00 to 3.00 mg/L (as NH ₃ -N)	0.01 mg/L	±0.04 mg/L ±4% of reading at 25 °C	425 nm	16 mm diameter	Adaptation of the ASTM Manual of Water and Environmental Technology, D1426 Nessler Method	#004	HI93700-01 Reagents for 100 tests HI93700-03 Reagents for 300 tests
Ammonia Low Range (13 mm Vial)	0.00 to 3.00 mg/L (as NH ₃ -N)	0.01 mg/L	±0.10 mg/L or ± 5% of reading at 25 °C, whichever is greater	425 nm	13 mm diameter	Adaptation of the ASTM Manual of Water and Environmental Technology, D1426 Nessler Method	#005	HI93764A-25 Reagents for 25 tests
Ammonia Low Range ISO (13 mm Vial)	0.000 to 2.500 mg/L (as NH ₄ ⁺)	0.001 mg/L	±0.015 mg/L ± 3% of reading at 25 °C	690 nm	13 mm diameter	ISO 23695	#101	HI96791-25 Reagents for 25 tests
Ammonia Medium Range	0.00 to 10.00 mg/L (as NH ₃ -N)	0.01 mg/L	±0.05 mg/L ± 5% of reading at 25 °C, whichever is greater	425 nm	16 mm diameter	Adaptation of the ASTM Manual of Water and Environmental Technology, D1426, Nessler Method	#006	HI93715-01 Reagents for 100 tests HI93715-03 Reagents for 300 tests
Ammonia High Range	0.0 to 100.0 mg/L (as NH ₄ ⁺)	0.1 mg/L	±0.5 mg/L ± 5% of reading at 25 °C	425 nm	16 mm diameter	Adaptation of the ASTM Manual of Water and Environmental Technology, D1426, Nessler Method	#007	HI93733-01 Reagents for 100 tests HI93733-03 Reagents for 300 tests
Ammonia High Range (13 mm Vial)	0.0 to 100.0 mg/L (as NH ₃ -N)	0.1 mg/L	±1.0 mg/L or ± 5% of reading at 25 °C, whichever is greater	430 nm	13 mm diameter	Adaptation of the ASTM Manual of Water and Environmental Technology, D1426 Nessler Method	#008	HI93764B-25 Reagents for 25 tests
Bromine	0.00 to 10.00 mg/L (as Br ₂)	0.01 mg/L	±0.08 mg/L ±3% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the Standard Methods for the Examination of Water and Wastewater, 18th Edition, DPD Method	#009	HI93716-01 Reagents for 100 tests HI93716-03 Reagents for 300 tests
Calcium	0 to 400 mg/L (as Ca ²⁺)	1 mg/L	±10 mg/L ±5% of reading at 25 °C	466 nm	22 mm diameter	Adaptation of the Oxalate Method	#010	HI937521-01 Reagents for 50 tests HI937521-03 Reagents for 150 tests
Calcium, Marine	200 to 600 mg/L (as Ca ²⁺)	1 mg/L	± 5% of reading at 25 °C	610 nm	16 mm diameter	Adaptation of the Zincon Method	#011	HI758-26 Reagents for 25 tests
Chloride	0.0 to 20.0 mg/L (as Cl ⁻)	0.1 mg/L	±0.5 mg/L ±5% of reading at 25 °C	455 nm	22 mm diameter	Adaptation of the Mercury (II) Thiocyanate Method	#012	HI93753-01 Reagents for 100 tests HI93753-03 Reagents for 300 tests
Chlorine Dioxide	0.00 to 2.00 mg/L (as ClO ₂)	0.01 mg/L	±0.10 mg/L ±5% of reading at 25 °C	575 nm	22 mm diameter	Adaptation of the Chlorophenol Red Method	#013	HI93738-01 Reagents for 100 tests HI93738-03 Reagents for 300 tests
Chlorine Dioxide (Rapid)	0.00 to 2.00 mg/L (as ClO ₂)	0.01 mg/L	±0.10 mg/L ±5% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of Standard Methods for the Examination of Water and Wastewater, 18th Edition, 4500 ClO ₂ D	#086	HI96779-01 Reagents for 100 tests HI96779-03 Reagents for 300 tests
Chlorine, Free Ultra Low Range	0.000 to 0.500 mg/L (as Cl ₂)	0.001 mg/L	±0.020 mg/L ±3% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the EPA DPD Method 330.5	#014	HI95762-01 Reagents for 100 tests HI95762-03 Reagents for 300 tests
Chlorine, Free Low Range (Powder Reagent)	0.00 to 5.00 mg/L (as Cl ₂)	0.01 mg/L	±0.03 mg/L ±3% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the EPA DPD Method 330.5	#015	HI93701-01 Reagents for 100 tests HI93701-03 Reagents for 300 tests
Chlorine, Free Low Range (Liquid Reagent)	0.00 to 5.00 mg/L (as Cl ₂)	0.01 mg/L	±0.03 mg/L ±3% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the EPA DPD Method 330.5	#016	HI93701-F Reagents for 300 tests (liquid)
Chlorine, Free High Range	0.00 to 10.00 mg/L (as Cl ₂)	0.01 mg/L	±0.03 mg/L ±3% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the EPA DPD Method 330.5	#017	HI93734-01 Reagents for 100 tests HI93734-03 Reagents for 300 tests
Chlorine, Total Ultra Low Range	0.000 to 0.500 mg/L (as Cl ₂)	0.001 mg/L	±0.020 mg/L ±3% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the EPA DPD Method 330.5	#018	HI95761-01 Reagents for 100 tests HI95761-03 Reagents for 300 tests
Chlorine, Total Low Range (Powder Reagent)	0.00 to 5.00 mg/L (as Cl ₂)	0.01 mg/L	±0.03 mg/L ±3% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the EPA DPD Method 330.5	#019	HI93711-01 Reagents for 100 tests (powder) HI93711-03 Reagents for 300 tests (powder)
Chlorine, Total Low Range (Liquid Reagent)	0.00 to 5.00 mg/L (as Cl ₂)	0.01 mg/L	±0.03 mg/L ±3% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the EPA DPD Method 330.5	#020	HI93701-T Reagents for 300 tests (liquid)
Chlorine, Total High Range	0.00 to 10.00 mg/L (as Cl ₂)	0.01 mg/L	±0.03 mg/L ±3% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the EPA DPD Method 330.5	#021	HI93734-01 Reagents for 100 tests HI93734-03 Reagents for 300 tests
Chlorine, Total Ultra High Range	0 to 500 mg/L (as Cl ₂)	1 mg/L	±3 mg/L ±3% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the Standard Methods for Examination of Water and Wastewater, 20th Edition, 4500-Cl	#022	HI95771-01 Reagents for 100 tests HI95771-03 Reagents for 300 tests

Parameter	Range	Resolution	Accuracy	Wavelength	Cuvette Type	Method	Method ID	Reagent Code
Chromium (VI) Low Range	0 to 300 µg/L (as Cr(VI))	1 µg/L	±10 µg/L ±4% of reading at 25 °C	535 nm	22 mm diameter	Adaptation of the ASTM Manual of Water and Environmental Technology, D1687 Diphenylcarbohydrazide Method	#023	HI93749-01 Reagents for 100 tests HI93749-03 Reagents for 300 tests
Chromium (VI) High Range	0 to 1000 µg/L (as Cr(VI))	1 µg/L	±5 µg/L ±4% of reading at 25 °C	535 nm	22 mm diameter	Adaptation of the ASTM Manual of Water and Environmental Technology, D1687-92, Diphenylcarbohydrazide Method	#024	HI93723-01 Reagents for 100 tests HI93723-03 Reagents for 300 tests
Chromium (VI)/Total (13 mm Vial)	0 to 1000 µg/L (as Cr)	1 µg/L	±10 µg/L ± 3% of reading	525 nm	13 mm diameter	Adaptation of the Standard Methods of the Examination of Water and Wastewater, 22nd Edition, 3500-Cr, Diphenylcarbazide Method	#087	HI96781-25 Reagents for 25 tests
Chemical Oxygen Demand Low Range EPA (13 mm Vial)	0 to 150 mg/L (as O ₂)	1 mg/L	±5 mg/L or ±4% of reading at 25 °C, whichever is greater	420 nm	13 mm diameter	Adaptation of the EPA 410.4 Approved Method for the COD Determination on Surface Waters and Wastewaters	#025	HI93754A-25 Reagents for 25 tests
Chemical Oxygen Demand Low Range Mercury Free (13 mm Vial)	0 to 150 mg/L (as O ₂)	1 mg/L	±5 mg/L or ±4% of reading at 25 °C, whichever is greater	420 nm	13 mm diameter	Dichromate Mercury Free	#026	HI93754D-25 Reagents for 25 tests
Chemical Oxygen Demand Low Range ISO (13 mm Vial)	0 to 150 mg/L (as O ₂)	1 mg/L	±5 mg/L or ±4% of reading at 25 °C, whichever is greater	420 nm	13 mm diameter	Dichromate ISO	#027	HI93754F-25 Reagents for 25 tests
Chemical Oxygen Demand Medium Range EPA (13 mm Vial)	0 to 1500 mg/L (as O ₂)	1 mg/L	±15 mg/L or ±3% of reading at 25 °C, whichever is greater	610 nm	13 mm diameter	Adaptation of the EPA 410.4 Approved Method for the COD Determination on Surface Waters and Wastewaters	#028	HI93754B-25 Reagents for 25 tests
Chemical Oxygen Demand Medium Range Mercury Free (13 mm Vial)	0 to 1500 mg/L (as O ₂)	1 mg/L	±15 mg/L or ±3% of reading at 25 °C, whichever is greater	610 nm	13 mm diameter	Dichromate Mercury Free	#029	HI93754E-25 Reagents for 25 tests
Chemical Oxygen Demand Medium Range ISO (13 mm Vial)	0 to 1000 mg/L (as O ₂)	1 mg/L	±15 mg/L or ±3% of reading at 25 °C, whichever is greater	610 nm	13 mm diameter	Dichromate ISO	#030	HI93754G-25 Reagents for 25 tests
Chemical Oxygen Demand High Range EPA (13 mm Vial)	0 to 15000 mg/L (as O ₂)	1 mg/L	±150 mg/L or ±2% of reading at 25 °C, whichever is greater	610 nm	13 mm diameter	Adaptation of the EPA 410.4 Approved Method for the COD Determination on Surface Waters and Wastewaters	#031	HI93754C-25 Reagents for 25 tests
Chemical Oxygen Demand Ultra High Range (13 mm Vial)	0.0 to 60.0 ppt (as O ₂)	0.1 ppt	±0.5 ppt ±3% of reading @ 25°C	610 nm	13 mm diameter	Adaptation of the EPA 410.4 Approved Method for the COD Determination on Surface Waters and Wastewaters	#088	HI93754J-25 Reagents for 25 tests
Color ADMI Low Range	0 to 250 ADMI Pt-Co	1 ADMI Pt-Co	±5 ADMI Pt-Co at 25 °C	400-700 nm	50 mm diameter	ADMI weighted ordinate Method, analogous APHA 2120F Method	#099	-
Color ADMI High Range	0 to 600 ADMI Pt-Co	1 ADMI Pt-Co	±20 ADMI Pt-Co at 25 °C	400-700 nm	10 mm diameter	ADMI weighted ordinate Method, analogous APHA 2120F Method	#100	-
Color of Water	0 to 500 PCU (Platinum Cobalt Units)	1 PCU	±10 PCU ±5% of reading at 25 °C	460 nm	22 mm diameter	Adaptation of the Standard Methods for the Examination of Water and Wastewater, 18th Edition, Colorimetric Platinum Cobalt Method	#032	-
Copper Low Range	0 to 1500 µg/L (as Cu)	1 µg/L	±10 µg/L ±5% of reading at 25 °C	575 nm	22 mm diameter	Adaptation of the EPA Method	#033	HI95747-01 Reagents for 100 tests HI95747-03 Reagents for 300 tests
Copper High Range	0.00 to 5.00 mg/L (as Cu)	0.01 mg/L	±0.02 mg/L ±4% of reading at 25 °C	560 nm	22 mm diameter	Adaptation of the EPA Method	#034	HI93702-01 Reagents for 100 tests HI93702-03 Reagents for 300 tests
Cyanide	0.000 to 0.200 mg/L (as CN ⁻)	0.001 mg/L	±0.005 mg/L ±3% of reading at 25 °C	610 nm	22 mm diameter	Pyridine-Pyrazalone	#035	HI93714-01 Reagents for 100 tests HI93714-03 Reagents for 300 tests
Cyanuric Acid	0 to 100 mg/L (as CYA)	1 mg/L	±1 mg/L ±15% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the Turbidimetric Method	#036	HI93722-01 Reagents for 100 tests HI93722-03 Reagents for 300 tests
Fluoride Low Range	0.00 to 2.00 mg/L (as F ⁻)	0.01 mg/L	±0.03 mg/L ±3% of reading at 25 °C	575 nm	22 mm diameter	Adaptation of the Standard Methods for the Examination of Water and Wastewater, 18th Edition, SPADNS Method	#037	HI93729-01 Reagents for 100 tests HI93729-03 Reagents for 300 tests
Fluoride High Range	0.0 to 20.0 mg/L (as F ⁻)	0.1 mg/L	±0.5 mg/L ±3% of reading at 25 °C	575 nm	22 mm diameter	Adaptation of the Standard Methods for the Examination of Water and Wastewater, 18th Edition, SPADNS Method	#038	HI93739-01 Reagents for 100 tests HI93739-03 Reagents for 300 tests

Parameter	Range	Resolution	Accuracy	Wavelength	Cuvette Type	Method	Method ID	Reagent Code
Hardness, Calcium	0.00 to 2.70 mg/L (as CaCO ₃)	0.01 mg/L	±0.08 mg/L ±4% of reading at 25 °C	523 nm	22 mm diameter	Adaptation of the Standard Methods for the Examination of Water and Wastewater, 18th Edition, Calmagite Method	#039	HI93720-01 Reagents for 100 tests HI93720-03 Reagents for 300 tests
Hardness, Magnesium	0.00 to 2.00 mg/L (as CaCO ₃)	0.01 mg/L	±0.11 mg/L ±5% of reading at 25 °C	523 nm	22 mm diameter	Adaptation of the Standard Methods for the Examination of Water and Wastewater, 18th Edition, EDTA Colorimetric Method	#040	HI93719-01 Reagents for 100 tests HI93719-03 Reagents for 300 tests
Hardness, Total Low Range	0 to 250 mg/L (as CaCO ₃)	1 mg/L	±5 mg/L ±4% of reading at 25 °C	466 nm	22 mm diameter	Adaptation of the EPA Method 130.1	#041	HI93735-00 Reagents for 100 tests (LR) HI93735-0 Reagents for 300 tests (LR - 100 tests, MR - 100 tests, HR - 100 tests)
Hardness, Total Medium Range	200 to 500 mg/L (as CaCO ₃)	1 mg/L	±7 mg/L ±3% of reading at 25 °C	466 nm	22 mm diameter	Adaptation of the EPA Method 130.1	#042	HI93735-01 Reagents for 100 tests (MR) HI93735-0 Reagents for 300 tests (LR - 100 tests, MR - 100 tests, HR - 100 tests)
Hardness, Total High Range	400 to 750 mg/L (as CaCO ₃)	1 mg/L	±10 mg/L ±2% of reading at 25 °C	466 nm	22 mm diameter	Adaptation of the EPA Method 130.1	#043	HI93735-02 Reagents for 100 tests (HR) HI93735-0 Reagents for 300 tests (LR - 100 tests, MR - 100 tests, HR - 100 tests)
Hydrazine	0 to 400 µg/L (as N ₂ H ₄)	1 µg/L	±3 µg/L ±3 % of reading at 25°C	466 nm	22 mm diameter	Adaptation of the ASTM Manual of Water and Environmental Technology, Method D1385,p-Dimethylaminobenzaldehyde Method	#044	HI93704-01 Reagents for 100 tests HI93704-03 Reagents for 300 tests
Iodine	0.0 to 12.5 mg/L (as I ₂)	0.1 mg/L	±0.1 mg/L ±5% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the Standard Methods for the Examination of Water and Wastewater, 18th Edition, DPD Method	#045	HI93718-01 Reagents for 100 tests HI93718-03 Reagents for 300 tests
Iron Low Range	0.000 to 1.600 mg/L (as Fe)	0.001 mg/L	±0.010 mg/L ±8% of reading at 25 °C	575 nm	22 mm diameter	Adaptation of the TPTZ Method	#046	HI93746-01 Reagents for 50 tests HI93746-03 Reagents for 150 tests
Iron High Range	0.00 to 5.00 mg/L (as Fe)	0.01 mg/L	±0.04 mg/L ±2% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 3500-Fe B, Phenanthroline Method	#047	HI93721-01 Reagents for 100 tests HI93721-03 Reagents for 300 tests
Iron (II) (Ferrous)	0.00 to 6.00 mg/L (as Fe ²⁺)	0.01 mg/L	±0.10 mg/L ±2% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 3500-Fe B, Phenanthroline Method	#089	HI96776-01 Reagents for 100 tests HI96776-03 Reagents for 300 tests
Iron (13 mm Vial)	0.00 to 6.00 mg/L (as Fe)	0.01 mg/L	±0.10 mg/L or ±3% of reading at 25°C	525 nm	13 mm diameter	Adaptation of Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 3500-Fe B, Phenanthroline Method	#096	HI96786-25 Reagents for 25 tests
Iron Total (13 mm Vial)	0.00 to 7.00 mg/L (as Fe)	0.01 mg/L	±0.20 mg/L or ± 3% of reading, whichever is greater	525 nm	13 mm diameter	Adaptation of Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 3500-Fe B, Phenanthroline Method	#090	HI96778-25 Reagents for 25 tests
Magnesium	0 to 150 mg/L (as Mg ²⁺)	1 mg/L	±5 mg/L ±3% of reading at 25 °C	466 nm	22 mm diameter	Adaptation of the Calmagite Method	#048	HI937520-01 Reagents for 50 tests HI937520-03 Reagents for 150 tests
Magnesium, Marine	1000 to 1800 mg/L (as Mg ²⁺)	5 mg/L	±5% of reading	640 nm	22 mm diameter	Adaptation of Colorimetric EDTA Method using calmagite indicator	#103	HI783-25 Reagents for 25 tests
Manganese Low Range	0 to 300 µg/L (as Mn)	1 µg/L	±7 µg/L ±3% of reading at 25 °C	560 nm	22 mm diameter	Adaptation of the PAN Method	#049	HI93748-01 Reagents for 50 tests HI93748-03 Reagents for 150 tests
Manganese High Range	0.0 to 20.0 mg/L (as Mn)	0.1 mg/L	±0.2 mg/L ±3% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the Standard Methods for the Examination of Water and Wastewater, 18th Edition, Periodate Method	#050	HI93709-01 Reagents for 100 tests HI93709-03 Reagents for 300 tests
Maple Syrup	0.00 to 100.00 %T	0.01 %T	±3% of reading at 25 °C	560 nm	10 mm diameter	Direct Measure	#051	HI93703-57 Glycerol (4 pcs.), 30 mL
Molybdenum	0.0 to 40.0 mg/L (as Mo ⁶⁺)	0.1 mg/L	±0.3 mg/L ±5% of reading at 25 °C	420 nm	22 mm diameter	Adaptation of the Mercaptoacetic Acid Method	#052	HI93730-01 Reagents for 100 tests HI93730-03 Reagents for 300 tests
Nickel Low Range	0.000 to 1.000 mg/L (as Ni)	0.001 mg/L	±0.010 mg/L ±7% of reading at 25 °C	565 nm	16 mm diameter	Adaptation of the PAN Method	#053	HI93740-01 Reagents for 50 tests HI93740-03 Reagents for 150 tests
Nickel High Range	0.00 to 7.00 ppt (as Ni)	0.01 ppt	±0.07 ppt±4% of reading at 25 °C	575 nm	22 mm diameter	Adaptation of the Photometric Method	#054	HI93726-01 Reagents for 100 tests HI93726-03 Reagents for 300 tests
Nitrate	0.0 to 30.0 mg/L (as NO ₃ ⁻ -N)	0.1 mg/L	±0.5 mg/L ±10% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the Cadmium Reduction Method	#055	HI93728-01 Reagents for 100 tests HI93728-03 Reagents for 300 tests

Parameter	Range	Resolution	Accuracy	Wavelength	Cuvette Type	Method	Method ID	Reagent Code
Nitrate Chromotropic Acid (13 mm Vial)	0.0 to 30.0 mg/L (as NO ₃ ⁻ -N)	0.1 mg/L	±1.0 mg/L or ±3% of reading at 25 °C, whichever is greater	410 nm	13 mm diameter	Chromotropic Acid Method	#056	HI93766-50 Reagents for 50 tests
Nitrate, Marine High Range	0.0 to 75.0 mg/L (as NO ₃ ⁻)	0.1 mg/L	±2.0 mg/L ± 5 % of reading	505 nm	16 mm diameter	Zinc Reduction Method	#102	HI782-25 Reagents for 25 tests
Nitrite Low Range	0 to 600 µg/L (as NO ₂ ⁻ -N)	1 µg/L	±20 µg/L ±4% of reading at 25 °C	480 nm	22 mm diameter	Adaptation of the EPA Diazotization Method 354.1	#058	HI93707-01 Reagents for 100 tests HI93707-03 Reagents for 300 tests
Nitrite Low Range (13 mm Vial)	0 to 600 µg/L (as NO ₂ ⁻ -N)	1 µg/L	±10 µg/L ± 3% of reading at 25°C, whichever is greater	525 nm	13 mm diameter	Adaptation of the Standard Method for the Examination of Water and Wastewater, 23rd Edition, 4500B Diazotization Method, Nitrogen Nitrite	#091	HI96783-25 Reagents for 25 tests
Nitrite Medium Range (13 mm Vial)	0.00 to 6.00 mg/L (as NO ₂ ⁻ -N)	0.01 mg/L	±0.10 mg/L ± 3% of reading at 25°C	525 nm	13 mm diameter	Adaptation of the Standard Method for the Examination of Water and Wastewater, 23rd Edition, 4500B Diazotization Method, Nitrogen Nitrite	#092	HI96784-25 Reagents for 25 tests
Nitrite High Range	0 to 150 mg/L (as NO ₂ ⁻)	1 mg/L	±4 mg/L ±4% of reading at 25 °C	575 nm	22 mm diameter	Adaptation of the Ferrous Sulfate Method	#059	HI93708-01 Reagents for 100 tests HI93708-03 Reagents for 300 tests
Nitrite, Marine Ultra Low Range	0 to 200 µg/L (as NO ₂ ⁻ -N)	1 µg/L	±8 µg/L ±4% of reading at 25 °C	480 nm	22 mm diameter	Adaptation of the EPA Diazotization Method 354.1	#057	HI764-25 Reagents for 25 tests
Nitrite, Seawater (13 mm Vial)	0 to 600 µg/L (as NO ₂ ⁻ -N)	1 µg/L	±15 µg/L ±5% of reading at 25 °C	525 nm	13 mm diameter	Adaptation of the Standard Method for the Examination of Water and Wastewater, 23rd Edition, 4500B Diazotization Method, Nitrogen Nitrite	#098	HI96789-25 Reagents for 25 tests
Nitrogen, Total Low Range (13 mm Vial)	0.0 to 25.0 mg/L (as N)	0.1 mg/L	±1.0 mg/L or ±5% of reading at 25 °C, whichever is greater	420 nm	13 mm diameter	Chromotropic Acid Method	#060	HI93767A-50 Reagents for up to 50 tests
Nitrogen, Total High Range (13 mm Vial)	10 to 150 mg/L (as N)	1 mg/L	±3 mg/L or ±4% of reading at 25 °C, whichever is greater	420 nm	13 mm diameter	Chromotropic Acid Method	#061	HI93767B-50 Reagents for up to 50 tests
Oxygen, Dissolved	0.0 to 10.0 mg/L (as O ₂)	0.1 mg/L	±0.4 mg/L ±3% of reading at 25 °C	466 nm	22 mm diameter	Adaptation of the Standard Methods for the Examination of Water and Wastewater, 18th Edition, Azide Modified Winkler Method	#062	HI93732-01 Reagents for 100 tests HI93732-03 Reagents for 300 tests
Oxygen Scavengers (Carbohydrazide)	0.00 to 1.50 mg/L (as Carbohydrazide)	0.01 mg/L	±0.02 mg/L ±3% of reading at 25 °C	575 nm	22 mm diameter	Adaptation of the Iron Reduction Method	#063	HI96773-01 Reagents for 50 tests HI96773-03 Reagents for 150 tests
Oxygen Scavengers (Diethylhydroxylamine) (DEHA)	0 to 1000 µg/L (as DEHA)	1 µg/L	±5 µg/L ±5% of reading at 25 °C	575 nm	22 mm diameter	Adaptation of the Iron Reduction Method	#064	HI96773-01 Reagents for 50 tests HI96773-03 Reagents for 150 tests
Oxygen Scavengers (Hydroquinone)	0.00 to 2.50 mg/L (as Hydroquinone)	0.01 mg/L	±0.04 mg/L ±3% of reading at 25 °C	575 nm	22 mm diameter	Adaptation of Iron Reduction Method	#065	HI96773-01 Reagents for 50 tests HI96773-03 Reagents for 150 tests
Oxygen Scavengers (Isoascorbic Acid)	0.00 to 4.50 mg/L (as Iso-Ascorbic Acid)	0.01 mg/L	±0.03 mg/L ±3 % of reading at 25 °C	575 nm	22 mm diameter	Adaptation of the Iron Reduction Method	#066	HI96773-01 Reagents for 50 tests HI96773-03 Reagents for 150 tests
Ozone	0.00 to 2.00 mg/L (as O ₃)	0.01 mg/L	±0.02 mg/L ±3% of reading at 25 °C	525 nm	22 mm diameter	Colorimetric DPD Method	#067	HI93757-01 Reagents for 100 tests HI93757-03 Reagents for 300 tests HI93703-52 Reagents for 100 tests (Optional)
pH	6.5 to 8.5 pH	0.1 pH	±0.1 pH at 25 °C	525 nm	22 mm diameter	Adaptation of the Phenol Red Method	#068	HI93710-01 Reagents for 100 pH tests HI93710-03 Reagents for 300 pH tests
Phenols (13 mm Vial)	0.00 to 5.00 mg/L	0.01 mg/L	±0.05 mg/L ±3 % of reading at 25 °C	510 nm	13 mm diameter	Adaptation of 4-aminoantipyrine Method EPA 420.1	#097	HI96788-25 Reagents for 25 tests
Phosphate Low Range	0.00 to 2.50 mg/L (as PO ₄ ³⁻)	0.01 mg/L	±0.04 mg/L ±4% of reading at 25 °C	610 nm	22 mm diameter	Adaptation of the Ascorbic Acid Method	#070	HI93713-01 Reagents for 100 tests HI93713-03 Reagents for 300 tests
Phosphate High Range	0.0 to 30.0 mg/L (as PO ₄ ³⁻)	0.1 mg/L	±1.0 mg/L ±4% of reading at 25 °C	525 nm	22 mm diameter	Adaptation of the Standard Methods for the Examination of Water and Wastewater, 18th Edition, Amino Acid Method	#071	HI93717-01 Reagents for 100 tests HI93717-03 Reagents for 300 tests
Phosphorus, Acid Hydrolyzable (13 mm Vial)	0.00 to 1.60 mg/L (as P)	0.01 mg/L	±0.05 mg/L or ±5% of reading at 25 °C, whichever is greater	610 nm	13 mm diameter	Adaptation of the EPA method 365.2 and Standard Methods for the Examination of Water and Wastewater, 20th Edition, 4500-P E, Ascorbic Acid Method	#072	HI93758B-50 Reagents for 50 tests

Parameter	Range	Resolution	Accuracy	Wavelength	Cuvette Type	Method	Method ID	Reagent Code
Phosphorus, Reactive Low Range (13 mm Vial)	0.00 to 1.60 mg/L (as P)	0.01 mg/L	±0.05 mg/L or ±4% of reading at 25 °C, whichever is greater	610 nm	13 mm diameter	Adaptation of the EPA method 365.2 and Standard Methods for the Examination of Water and Wastewater, 20th Edition, 4500-P E, Ascorbic Acid Method	#073	HI93758A-50 Reagents for 50 tests
Phosphorus, Reactive High Range (13 mm Vial)	0.0 to 32.6 mg/L (as P)	0.1 mg/L	±0.5 mg/L or ±4% of reading at 25 °C, whichever is greater	420 nm	13 mm diameter	Adaptation of the Standard Methods for the Examination of Water and Wastewater, 20th Edition, 4500-P C, Vanadomolybdophosphoric Acid Method	#074	HI93763A-50 Reagents for up to 50 tests
Phosphorus, Total Low Range (13 mm Vial)	0.00 to 1.60 mg/L (as P)	0.01 mg/L	±0.05 mg/L or ±5% of reading at 25 °C, whichever is greater	610 nm	13 mm diameter	Adaptation of the EPA method 365.2 and Standard Methods for the Examination of Water and Wastewater, 20th Edition, 4500-P E, Ascorbic Acid Method	#075	HI93758C-50 Reagents for 50 tests
Phosphorus, Total High Range (13 mm Vial)	0.0 to 32.6 mg/L (as P)	0.1 mg/L	±0.5 mg/L or ±5% of reading at 25 °C, whichever is greater	420 nm	13 mm diameter	Adaptation of the Standard Methods for the Examination of Water and Wastewater, 20th Edition, 4500-P C, Vanadomolybdophosphoric Acid Method	#076	HI93763B-50 Reagents for up to 50 tests
Phosphorus, Marine Ultra Low Range	0 to 200 µg/L (as P)	1 µg/L	±5 µg/L ±5% of reading at 25 °C	610 nm	22 mm diameter	Adaptation of Standard Methods for the Examination of Water and Wastewater, 20th Edition, Ascorbic Acid Method	#069	HI736-25 Reagents for 25 tests
Potassium Low Range	0.0 to 20.0 mg/L (as K)	0.1 mg/L	±2 mg/L ±7% of reading at 25 °C	466 nm	22 mm diameter	Adaptation of the Turbidimetric Tetraphenylborate Method	#077	HI93750-01 Reagents for 100 tests HI93750-03 Reagents for 300 tests
Potassium Medium Range	10 to 100 mg/L (as K)	1 mg/L	±10 mg/L ±7% of reading at 25 °C	466 nm	22 mm diameter	Adaptation of the Turbidimetric Tetraphenylborate Method	#078	HI93750-01 Reagents for 100 tests HI93750-03 Reagents for 300 tests
Potassium High Range	20 to 200 mg/L (as K)	1 mg/L	±20 mg/L ±7% of reading at 25 °C	466 nm	22 mm diameter	Adaptation of the Turbidimetric Tetraphenylborate Method	#079	HI93750-01 Reagents for 100 tests HI93750-03 Reagents for 300 tests
Silica Low Range	0.00 to 2.00 mg/L (as SiO ₂)	0.01 mg/L	±0.03 mg/L ±5% of reading at 25 °C	610 nm	22 mm diameter	Adaptation of the ASTM Manual of Water and Environmental Technology, D859, Heteropoly Molybdenum Blue Method	#080	HI93705-01 Reagents for 100 tests HI93705-03 Reagents for 300 tests
Silica High Range	0 to 200 mg/L (as SiO ₂)	1 mg/L	±1 mg/L ±5% of reading at 25 °C	466 nm	22 mm diameter	Adaptation of the EPA Method 370.1 for Drinking, Surface and Saline Waters, Domestic and Industrial Wastes and Standard Method 4500-SiO ₂	#081	HI96770-01 Reagents for 100 tests HI96770-03 Reagents for 300 tests
Silver	0.000 to 1.000 mg/L (as Ag)	0.001 mg/L	±0.020 mg/L ±5% of reading at 25 °C	570 nm	22 mm diameter	Adaptation of the PAN Method	#082	HI93737-01 Reagents for 50 tests HI93737-03 Reagents for 150 tests
Sulfate	0 to 150 mg/L (as SO ₄ ²⁻)	1 mg/L	±5 mg/L ±3% of reading at 25 °C	466 nm	22 mm diameter	Sulfate is precipitated with barium chloride crystals	#083	HI93751-01 Reagents for 100 tests HI93751-03 Reagents for 300 tests
Surfactants, Anionic	0.00 to 3.50 mg/L (as SDBS)	0.01 mg/L	±0.04 mg/L ±3% of reading at 25 °C	610 nm	22 mm diameter	Adaptation of the EPA Method 425.1 and Standard Methods for the Examination of Water and Wastewater, 20th Edition, 5540C, Anionic Surfactants as MBAS	#084	HI95769-01 Reagents for 40 tests
Surfactants, Anionic (13 mm Vial)	0.00 to 3.50 mg/L (as SDBS)	0.01 mg/L	±0.10 mg/L ±5% of reading at 25 °C	610 nm	13 mm diameter	Adaptation of the Standard Method for the Examination of Water and Wastewater, 23rd Edition, 5540C, Anionic Surfactants as MBAS	#093	HI96782-25 Reagents for 25 tests
Surfactants, Cationic (13 mm Vial)	0.00 to 2.50 mg/L (as CTAB)	0.01 mg/L	±0.15 ppm ±3% of reading at 25 °C	420 nm	13 mm diameter	Bromophenol Blue Method	#095	HI96785-25 Reagents for 25 tests
Surfactants, Nonionic (13 mm Vial)	0.00 to 6.00 mg/L (TRITON X-100)	0.01 mg/L	±0.10 mg/L ±5% of reading at 25 °C	610 nm	13 mm diameter	TBPE Method	#094	HI96780-25 Reagents for 25 tests
Zinc	0.00 to 3.00 mg/L (as Zn)	0.01 mg/L	±0.03 mg/L ±3% of reading at 25 °C	620 nm	22 mm diameter	Adaptation of the Standard Methods for the Examination of Water and Wastewater, 18th Edition, Zincon Method	#085	HI93731-01 Reagents for 100 tests HI93731-03 Reagents for 300 tests

Cuvette adapters



16 mm



10 mm



13 mm

General specifications

Wavelength range	340 to 900 nm												
Wavelength resolution	1 nm												
Wavelength accuracy	±1.5 nm												
Photometric range	0.000 to 3.000 Abs												
Photometric accuracy	5 mAbs at 0.000 to 0.500 Abs, 1 % at 0.500 to 3.000 Abs												
Measurement mode	Transmittance (%), absorbance and concentration												
Sample cell	10 mm square, 50 mm rectangular, 16 mm round, 22 mm round, 13 mm round (vial)												
Wavelength selection	Automatic, based on the selected method (editable for user methods only)												
Light source	Tungsten halogen lamp												
Optical system	Split beam												
Wavelength calibration	Internal, automatic at power-on (with visual feedback)												
Stray light	<0.1 % T at 340 nm with NaNO ₂												
Spectral bandwidth	5 nm												
Number of methods	Up to 150 factory (103 pre-loaded), up to 100 user												
Data points stored	9999 measured values												
Export capability	csv file format, pdf file format												
Connectivity	1x USB A (mass storage host), 1x USB B (mass storage device)												
Battery life	3000 measurements or 8 hours*												
Power supply	15 Vdc power adapter, 10.8 Vdc Li-ion rechargeable battery												
Environment	0 to 50 °C (32 to 122 °F), 0 to 95% RH												
Dimensions	155 x 205 x 322 mm (6.1 x 8.0 x 12.6")												
Weight	3 kg (6.6 lbs.)												
Ordering information	HI802-01 (115V) and HI802-02 (230V) is supplied with sample cuvette and cap, 22 mm (4 pcs.), cuvette adapter (3 pcs.), vial adapter with barcode reading feature, cloth for wiping cuvettes, scissors, USB cable, 15 VDC power adapter, USB flash drive, instrument quality certificate, and instruction manual.												
Accessories	<table border="1"> <tr> <td>HI7408018</td> <td>Replacement 13 mm vial adapter with barcode reader</td> </tr> <tr> <td>HI7408011</td> <td>Replacement 16 mm vial adapter</td> </tr> <tr> <td>HI7408012</td> <td>Replacement 10 mm vial adapter</td> </tr> <tr> <td>HI7408014</td> <td>Replacement Tungsten-Halogen lamp</td> </tr> <tr> <td>HI7408015</td> <td>Replacement battery</td> </tr> <tr> <td>HI801-11</td> <td>Holmium Oxide Filter for wavelength accuracy verification, with certificate</td> </tr> </table>	HI7408018	Replacement 13 mm vial adapter with barcode reader	HI7408011	Replacement 16 mm vial adapter	HI7408012	Replacement 10 mm vial adapter	HI7408014	Replacement Tungsten-Halogen lamp	HI7408015	Replacement battery	HI801-11	Holmium Oxide Filter for wavelength accuracy verification, with certificate
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*excluding vial rotation





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The specifications listed in this brochure are subject to change by the manufacturer and therefore cannot be guaranteed to be correct. If there are aspects of the specification that must be guaranteed, please provide these to our sales team so that details can be confirmed.

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