

AMMONIA/CHLORIDE

HI 96700 & HI 96715

Ammonia Portable Photometers

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features

The HI 96700 and HI 96715 meters measure the ammonia-nitrogen ($\text{NH}_3\text{-N}$) content in water samples. These meters use an exclusive positive-locking system to ensure that the cuvette is in the same place every time it is placed into the measurement cell.



Specifications	HI 96700 Ammonia LR	HI 96715 Ammonia MR																		
Range	0.00 to 3.00 mg/L (ppm) (as $\text{NH}_3\text{-N}$)	0.00 to 9.99 mg/L (ppm) (as $\text{NH}_3\text{-N}$)																		
Resolution	0.01 mg/L (ppm)																			
Accuracy @ 25°C (77°F)	±0.04 mg/L ±4% of reading	±0.05 mg/L ±5% of reading																		
Ordering	HI 96700 and HI 96715 are supplied with sample cuvettes (2) with caps, 9V battery, instrument quality certificate and instruction manual. CAL Check™ standards and testing reagents sold separately.																			
Reagents and Standards	<table border="1"> <tr> <td>HI 96700</td> <td>HI 96700-11</td> <td>CAL Check™ standard cuvettes</td> </tr> <tr> <td></td> <td>HI 93700-01</td> <td>Reagents for 100 tests (N-NH₃ LR)</td> </tr> <tr> <td></td> <td>HI 93700-03</td> <td>Reagents for 300 tests (N-NH₃ LR)</td> </tr> <tr> <td>HI 96715</td> <td>HI 96715-11</td> <td>CAL Check™ standard cuvettes</td> </tr> <tr> <td></td> <td>HI 93715-01</td> <td>Reagents for 100 tests (N-NH₃ MR)</td> </tr> <tr> <td></td> <td>HI 93715-03</td> <td>Reagents for 300 tests (N-NH₃ MR)</td> </tr> </table>	HI 96700	HI 96700-11	CAL Check™ standard cuvettes		HI 93700-01	Reagents for 100 tests (N-NH ₃ LR)		HI 93700-03	Reagents for 300 tests (N-NH ₃ LR)	HI 96715	HI 96715-11	CAL Check™ standard cuvettes		HI 93715-01	Reagents for 100 tests (N-NH ₃ MR)		HI 93715-03	Reagents for 300 tests (N-NH ₃ MR)	
HI 96700	HI 96700-11	CAL Check™ standard cuvettes																		
	HI 93700-01	Reagents for 100 tests (N-NH ₃ LR)																		
	HI 93700-03	Reagents for 300 tests (N-NH ₃ LR)																		
HI 96715	HI 96715-11	CAL Check™ standard cuvettes																		
	HI 93715-01	Reagents for 100 tests (N-NH ₃ MR)																		
	HI 93715-03	Reagents for 300 tests (N-NH ₃ MR)																		

The reagents are in liquid form and are supplied in bottles. The amount of reagents is precisely dosed to ensure maximum repeatability.

HI 4101 Ammonia Ion Selective Electrode

For use with compatible ISE meters

ISE Solutions
See our compatible ISE Solutions p. 40



Specifications	
Measurement Range	1M to 1X 10 ⁻⁶ M 17000 to 0.02 mg/L (ppm) 14000 to 0.016 mg/L as N
Optimum pH Range	>11
Temperature Range	0 to 40°C
Approximate Slope	-56
Body O.D.	12 mm
Insertion Length	120 mm
Body Material	Delrin
Ordering	HI 4101 gas-sensing; combination ISE with 1m coaxial cable and BNC connection

HI 4107 Chloride Ion Selective Electrode

for use with compatible ISE meters

ISE Solutions
See our compatible ISE Solutions p. 40



Specifications	
Measurement Range	1M to 5X 10 ⁻⁶ M 35000 to 1.8 mg/L (ppm)
Optimum pH Range	2 to 11
Temperature Range	0 to 80°C
Approximate Slope	-57
Body O.D.	12 mm
Insertion Length	120 mm
Body Material	PEI
Ordering	HI 4107 solid-state; combination ISE with 1m coaxial cable and BNC connection

Chloride

Chloride ions are one of the major inorganic anions in water and wastewater.

Effects on humans

A normal adult human body contains approximately 81.7 g chloride. On the basis of a total obligatory loss of chloride of approximately 530 mg/day, a dietary intake of 9 mg of chloride per kg of body weight for adults has been recommended (equivalent to slightly more than 1 g of table salt per person per day).

Chloride toxicity has not been observed in humans except in the special case of impaired sodium chloride metabolism, e.g. in congestive heart failure. Healthy individuals can tolerate the intake of large quantities of chloride provided that there is an accompanying intake of fresh water. Little is known about the effect of prolonged intake of large amounts of chloride in the diet. As shown with experimental animals, hypertension associated with sodium chloride intake appears to be related to the sodium rather than the chloride ion.

Other considerations

Chloride increases the electrical conductivity of water and thus increases its corrosivity. In metal pipes, chloride reacts with metal ions to form soluble salts, thus increasing levels of metals in drinking-water. In lead pipes, a protective oxide layer is built up, but chloride enhances galvanic corrosion. It can also increase the rate of pitting corrosion of metal pipes.

Chloride concentrations in excess of about 250 mg/L can be detected by taste in water, but the threshold depends upon the associated cations. Consumers can, however, become accustomed to concentrations in excess of 250 mg/L.



HI 3815 Chloride Test Kit

Specifications

Method	Range	Smallest Increment	# Tests
titration	0-100 mg/L (ppm) 0-1000 mg/L (ppm)	1 mg/L (ppm) 10 mg/L (ppm)	110 avg.
Ordering	HI 3815 test kit comes with 15 mL diphenyl-carbazone indicator, 30 mL nitric acid solution, 120 mL mercuric nitrate solution, 50 mL calibrated vessel, 10 mL calibrated vessel, calibrated syringe with tip.		

Ion Selective Electrode Types

Hanna's ion selective electrodes for water and wastewater analysis can be grouped into two general categories based upon construction.

Solid State

Solid state electrodes are available as both single half cells or as combination electrodes complete with reference electrode. These electrodes incorporate a solid sensing surface made of compressed silver halides, or solid crystalline material. Hanna's offering includes sensors for the determination of chloride, cyanide, fluoride, nitrate and silver ions. Rugged, solid body construction ensures a long life.

Theory: A solid state electrode develops a voltage due to ion-exchange occurring between the sample and the inorganic membrane. An equilibrium mechanism occurs due to the very limited solubility of the membrane material in the sample.

Gas

Gas sensors are combination electrodes that detect dissolved gases in a solution. No external reference is required for these electrodes. The sensing element is separated from the sample solution by a gas permeable membrane. Hanna's offering includes the HI 4101 Ammonia electrode.

Theory: A gas sensor works due to the partial pressure of the measured gas in solution. The dissolved gas in the sample diffuses into the membrane and changes the pH in a thin film of unbuffered electrolyte on the surface of the internal pH sensor. Diffusion continues until the partial pressure of the sample and the thin film are the same. The pH change is proportional to the dissolved gas in the sample.

Chlorine

Free Chlorine

Free chlorine reacts with ammonium ions and organic compounds to form chlorine compounds resulting in diminished disinfecting capabilities compared with free chlorine. These chlorine compounds together with chloramines form combined chlorine. Combined chlorine and excess free chlorine together result in total chlorine. While free chlorine has a much higher disinfectant potential, combined chlorine has a much higher stability and has a lesser volatility. There should be sufficient levels of unreacted free chlorine for adequate disinfection, but not so much as to become harmful.

Total Chlorine

Total Chlorine The chlorination of water supplies and polluted waters is used mainly to destroy or deactivate disease-producing micro-organisms. It also serves to improve the quality of drinking waters, as chlorine reacts with ammonia, iron, manganese, sulfide and some organic substances.

Nevertheless, high amounts of chlorine will produce adverse effects, like formation of compounds which are potentially carcinogenic (e.g. chloroform) or harmful to aquatic life (e.g. chloramines). Thus it is essential to control that the proper amount of chlorine has been added in order to fulfill the primary purpose of disinfecting and to minimize any adverse effects.

Chlorine Dioxide

Chlorine dioxide is used primarily as a disinfectant in drinking water and also in various industrial processes. In drinking water applications, it is gaining popularity over chlorine, considering that it does not generate trihalomethanes when reacting with organic compounds. In industrial applications, it is used as a bleaching agent in such applications as pulp and paper.

Chlorine Dioxide is considered a highly-effective, eco-friendly microbicide that carries

HI 38017 Free & Total Chlorine Test Kits

Low and Medium Range with Checker Disc.



Specifications

Method	Range	Smallest Increment	# Tests
checker disc	0.00-0.70 mg/L (ppm) 0.0-3.5 mg/L (ppm)	0.02 mg/L (ppm) 0.1 mg/L (ppm)	200

Ordering

HI 38017 test kit comes with HI 93701-0 free chlorine reagent (100 packets), HI 93711-0 total chlorine reagent (100 packets), demineralizer bottle with filter cap for 12 L, checker disc, glass vials with caps (2) and 3 mL plastic pipettes.

HI 3829F Free Chlorine Test Kit

With color cube.



Specifications

Method	Range	Smallest Increment	# Tests
colorimetric	0.0-2.0 mg/L (ppm)	0.5 mg/L (ppm)	50 avg.

Ordering

HI 3829F test kit comes with color comparison cube, 20 mL reagent 1 and 15 mL reagent 2

HI 3831T Total Chlorine Test Kit



Specifications

Method	Range	Smallest Increment	# Tests
colorimetric	0.0-2.5 mg/L (ppm)	0.5 mg/L (ppm)	50 avg.

Ordering

HI 3831T test kits comes with color comparison cube, 20 mL chlorine reagent 1, 15 mL chlorine reagent 2 and 15 mL chlorine reagent 3

HI 96711C Chlorine, Free and Total Portable Photometer

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features



The HI 96711C meter measures the free and total chlorine (Cl₂) portable parameters content in water and wastewater. This meter uses an exclusive positive-locking system to ensure that the cuvette is in the same place every time it is placed into the measurement cell.

Specifications

Range	0.00 to 5.00 mg/L (ppm)
Resolution	0.01 mg/L from 0.00 to 3.50 mg/L (ppm); 0.10 mg/L above 3.50 mg/L (ppm)
Accuracy @ 25°C (77°F)	±0.03 mg/L ±3% of reading

Ordering

HI 96711C includes photometer, CAL Check™ standards, sample cuvettes (2) with caps, 9V battery, scissors, cuvette cleaning cloth, instrument quality certificate, instruction manual and rigid carrying case. Reagents sold separately.

Reagents and Standards

HI 96701-11	CAL Check™ standard cuvettes
HI 93701-01	Reagents for 100 tests
HI 93701-03	Reagents for 300 tests
HI 96711-11	CAL Check™ standard cuvettes
HI 93711-01	Reagents for 100 tests
HI 93711-03	Reagents for 300 tests

HI 96701C Free Chlorine Portable Photometer

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features



The HI 96701C meter measures the free chlorine (Cl₂) content in water samples in the 0.00 to 5.00 mg/L (ppm) range.

Specifications

Range	0.00 to 5.00 mg/L (ppm)
Resolution	0.01 mg/L from 0.00 to 3.50 mg/L (ppm); 0.10 mg/L above 3.50 mg/L (ppm)
Accuracy @ 25°C (77°F)	±0.03 mg/L ±3% of reading

Ordering

HI 96701C includes photometer, CAL Check™ standards, sample cuvettes (2) with caps, 9V battery, cuvette cleaning cloth, instrument quality certificate, instruction manual and rigid carrying case. Reagents sold separately.

Reagents and Standards

HI 96701-11	CAL Check™ Standard Cuvettes
HI 93701-01	Reagents for 100 tests
HI 93701-03	Reagents for 300 tests

CHLORINE DIOXIDE/CHROMIUM (HEXAVALENT)



Kit versions end in a "C"

Our 96 series photometers that end with a "C" in the part number include CALCheck™ standard cuvettes, cuvette cleaning cloth and scissors (when applicable) bundled in a deluxe hardshell carrying case

HI 96 Series Portable Photometers

Hanna's line of portable photometers include features such as an advanced optical system and Hanna's exclusive CAL Check™ validation function. The advanced optical system is based on a special tungsten lamp and a narrow band interference filter to assure accurate readings.

With the exclusive CAL Check™ validation function, users are able to verify the performance of the instrument at any time. With just a few short steps, the validation procedure is extremely user friendly and ensures that the meter is properly calibrated.

CAL Check™ Validation*

2-step validation procedure for proper calibration.

Zero the meter prior to validation...

Place the CAL Check™ Standard A into the cuvette holder and press CAL button. The lamp, cuvette and detector icons will appear on the display followed by "-0.0-". The meter is now zeroed and ready for validation.

... and compare accuracy against a known standard.

Place the CAL Check™ standard B into the cuvette holder and press CAL Check™. The lamp, cuvette and detector icons together with "CAL Check" will appear on the display. At the end of the measurement the display will show the validation standard value.

CAL Check™ Calibration*

Calibrate your instrument quickly and easily.

Zero the meter prior to calibration...

Press and hold CAL Check™ for three seconds to enter calibration mode. Place the CAL Check™ Standard A into the cuvette holder and press ZERO/CFM. The lamp, cuvette and detector icons will appear on the display followed by "-0.0-". The meter is now zeroed and ready for calibration.

... and calibrate to a known standard.

Place the CAL Check™ Standard B into the cuvette holder. Press READ and the lamp, cuvette and detector icons will appear on the display. After measurement the instrument will show the CAL Check™ Standard value.

HI 96738 Chlorine Dioxide Portable Photometer

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features

The HI 96738C meter measures the chlorine dioxide content in water samples in the 0.00 to 2.00 mg/L range. This meter uses an exclusive positive-locking system to ensure that the cuvette is in the same place every time it is placed into the measurement cell.



Specifications

Range	0.00 to 2.00 mg/L (ppm)
Resolution	0.01 mg/L (ppm)
Accuracy @ 25°C (77°F)	±0.10 mg/L ±5% of reading
Ordering	HI 96738 is supplied with sample cuvettes (2) with caps, 9V battery, instrument quality certificate and instruction manual. CAL Check™ standards and testing reagents sold separately.
Reagents and Accessories	HI 96738-11 CAL Check™ standard cuvettes HI 93738-01 Reagents for 100 tests HI 93738-03 Reagents for 300 tests

The reagents are in powder form and are supplied in packets. The amount of reagent is precisely dosed to ensure the maximum repeatability.

HI 96723 Chromium VI High Range Portable Photometer

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features

The HI 96723 measures the hexavalent chromium (Cr VI) content in water and wastewater samples.



Specifications

Range	0 to 1000 µg/L (ppb)
Resolution	1 µg/L (ppb)
Accuracy @ 25°C (77°F)	±5 mg/L ±4% of reading
Ordering	HI 96723 is supplied with sample cuvettes (2) with caps, 9V battery, instrument quality certificate and instruction manual. CAL Check™ standards and testing reagents sold separately.
Reagents and Standards	HI 96723-11 CAL Check™ standard cuvettes HI 93723-01 Reagents for 100 tests HI 93723-03 Reagents for 300 tests

The reagent is in powder form and is supplied in packets. The amount of reagent is precisely dosed to ensure maximum repeatability.

a number of important regulatory approvals from several international organizations, including the US EPA, FDA and UK Government, for many of its uses.

Chlorine and bromine react rapidly with microbiological species and chemicals in water. This reactivity is both their strength and weakness. Since chemical reactions are usually the first to take place, only the small residual of the product remaining after the chemical reaction is completed is available for microbiological control.

Chlorine dioxide is a very safe and potent biocide. It is effective over a wide pH range in both hard and soft water and does not react with most other water treatment chemicals.

Chromium

All compounds of chromium are colored; the most important are the chromates of sodium and potassium and the dichromates of potassium and ammonium. The dichromates are used as oxidizing agents in quantitative analysis, they are also used in tanning leather.

Another compound of industrial value is lead chromate, which is chrome yellow, a valuable pigment.

Chromium compounds are used in the textile industry as mordants, and by the aircraft and other industries for anodizing aluminum.

At normal temperatures, chromium is corrosion-resistant. For this reason, it plays an important role in the plating industry as well as cooling towers. In addition, it has certain qualities that make it useful in the production processes of the textile industry.

Chromium is very useful in industry, but the by-product hexavalent chromium is produced, which is a known carcinogen, and must be removed from wastewater.

HI 96702C Copper, High Range Portable Photometer

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features

The HI 96702C meter measures the copper content in water and wastewater.



Specifications

Range	0.00 to 5.00 mg/L (ppm)						
Resolution	0.01 mg/L (ppm)						
Accuracy @ 25°C (77°F)	±0.02 mg/L ±4% of reading @ 25°C						
Ordering	HI 96702C includes photometer, CAL Check™ standards, sample cuvettes (2) with caps, 9V battery, scissors, cuvette cleaning cloth, instrument quality certificate, instruction manual and rigid carrying case. Reagents sold separately.						
Reagents and Standards	<table border="1"> <tr> <td>HI 96702-11</td> <td>CAL Check™ Standard Cuvettes</td> </tr> <tr> <td>HI 93702-01</td> <td>Reagents for 100 tests</td> </tr> <tr> <td>HI 93702-03</td> <td>Reagents for 300 tests</td> </tr> </table>	HI 96702-11	CAL Check™ Standard Cuvettes	HI 93702-01	Reagents for 100 tests	HI 93702-03	Reagents for 300 tests
HI 96702-11	CAL Check™ Standard Cuvettes						
HI 93702-01	Reagents for 100 tests						
HI 93702-03	Reagents for 300 tests						

HI 96729C Fluoride Portable Photometer

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features

The HI 96729C meter measures the fluoride (F⁻) content in the 0.00 to 2.00 mg/L (ppm) range, in drinking, surface and waste waters.



Specifications

Range	0.00 to 2.00 mg/L (ppm)								
Resolution	0.01 mg/L (ppm)								
Accuracy @ 25°C (77°F)	±0.03 mg/L ±3% of reading								
Ordering	HI 96729C includes photometer, CAL Check™ standards, sample cuvettes (2) with caps, 2000 µL automatic pipette with instruction sheet, 9V battery, cuvette cleaning cloth, instrument quality certificate, instruction manual and rigid carrying case. Reagents sold separately.								
Reagents and Standards	<table border="1"> <tr> <td>HI 93703-53</td> <td>Reagent for reducing chlorine concentration</td> </tr> <tr> <td>HI 96729-11</td> <td>CAL Check™ standard cuvettes</td> </tr> <tr> <td>HI 93729-01</td> <td>Reagents for 100 tests</td> </tr> <tr> <td>HI 93729-03</td> <td>Reagents for 300 tests</td> </tr> </table>	HI 93703-53	Reagent for reducing chlorine concentration	HI 96729-11	CAL Check™ standard cuvettes	HI 93729-01	Reagents for 100 tests	HI 93729-03	Reagents for 300 tests
HI 93703-53	Reagent for reducing chlorine concentration								
HI 96729-11	CAL Check™ standard cuvettes								
HI 93729-01	Reagents for 100 tests								
HI 93729-03	Reagents for 300 tests								

The reagents are in liquid form and are supplied in bottles. The amount of reagent is precisely dosed by use of the supplied automatic pipette to ensure the maximum repeatability.

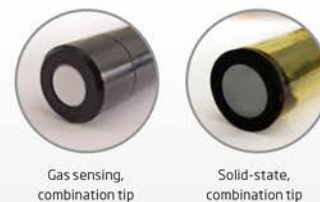
HI 3847 Copper Test Kit

Copper salts react with bicinchoninate reagent to form a purple product in a neutral buffered condition. The amount of color developed is directly proportional to the concentration of copper present in the aqueous sample.



Method	Range	Smallest Increment	# Tests
colorimetric	0.0-2.5 mg/L (ppm)	0.5 mg/L (ppm)	100
Ordering	HI 3847 test kit comes with HI 3847-0 reagent (100 packets) and color comparison cube.		

About Our Combination Ion Specific Electrodes



Combination electrodes include a sensor and reference electrode in a single electrode body. Our combination ion selective electrodes provide the same selectivity and response as our ISE half cells, but include our superior double junction reference into the same electrode body. Combination solid state electrodes have a built-in solid state sensor and quick refillable reference electrode.

HI 4109 Cyanide Ion Selective Electrode

for use with compatible ISE meters



ISE Solutions
See our compatible ISE Solutions p.40

Specifications

Measurement Range	10 ⁻⁴ M to 1X 10 ⁻⁴ M 260 to 0.02 mg/L (ppm)
Optimum pH Range	>11
Temperature Range	0 to 80°C
Approximate Slope	-57
Body O.D.	12 mm
Insertion Length	120 mm
Body Material	PEI
Ordering	HI 4109 solid-state; combination ISE with 1m coaxial cable and BNC connection

HI 4110 Fluoride Ion Selective Electrode

for use with compatible ISE meters



ISE Solutions
See our compatible ISE Solutions p.40

Specifications

Measurement Range	1M to 1X 10 ⁻⁴ M Sat. to 0.02 mg/L (ppm)
Optimum pH Range	5 to 8
Temperature Range	0 to 80°C
Approximate Slope	-56
Body O.D.	12 mm
Insertion Length	120 mm
Body Material	PEI/epoxy
Ordering	HI 4110 solid-state; combination ISE with 1m coaxial cable and BNC connection

HARDNESS/IRON

HI 96735C

Hardness, EPA Portable Photometer

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features

The HI 93735C measures the total hardness in drinking, surface and wastewater.



Specifications

	Hardness LR (P1)	Hardness MR (P2)	Hardness HR (P3)
Range	0 to 250 mg/L (ppm)	200 to 500 mg/L (ppm)	400 to 750 mg/L (ppm)
Resolution	1 mg/L from 0 to 100 mg/L, 5 mg/L from 100 to 250 mg/L	1 mg/L from 0-100 5 mg/L from 100-750	5 mg/L
Accuracy @ 25°C (77°F)	±5 mg/L ±4% of reading	±7 mg/L ±3% of reading	±10 mg/L ±2% of reading

Ordering

HI 96735C is supplied with CAL Check™ standards, sample cuvettes (2) with caps, 9V battery, cuvette cleaning cloth, instrument quality certificate, instruction manual and rigid carrying case. Reagents sold separately.

Reagents and Standards

HI 96735-11	CAL Check™ standard cuvettes
HI 93735-00	Reagents for 100 tests (0-250 mg/L)
HI 93735-01	Reagents for 100 tests (200-500 mg/L)
HI 93735-02	Reagents for 100 tests (400-750 mg/L)
HI 93735-0	Reagents for 100 tests (0-750 mg/L)

The reagents are in liquid and powder form and are supplied in bottles and in packets. The amount of reagent is precisely dosed to ensure maximum repeatability.

HI 96746 • HI 96721C

Iron Portable Photometers

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features

The HI 96746 meter measures the iron content in water, wastewater and seawater in the 0.00 to 1.60 mg/L (ppm) range.

The HI 96721 meter measures total iron (Fe) content in water samples in the 0.00 to 5.00 mg/L (ppm) range.



Specifications

	HI 96746 Iron LR	HI 96721 Iron HR
Range	0.00 to 1.60 mg/L (ppm)	0.00 to 5.00 mg/L (ppm)
Resolution	0.01 mg/L (ppm)	
Accuracy @ 25°C (77°F)	±0.01 mg/L ±8% of reading	±0.04 mg/L ±2% of reading

Ordering

HI 96746 and HI 96721C includes photometer, sample cuvettes (2) with caps, 9V battery, instrument quality certificate and instruction manual. HI 96721C also includes CAL Check™ standards, scissors, cuvette cleaning cloth and rigid carrying case. Reagents sold separately.

Reagents and Standards

HI 96746	HI 96746-11	CAL Check™ standard cuvettes
	HI 93746-01	Powder reagents for 100 tests
	HI 93746-03	Powder reagents for 300 tests
HI 96721	HI 96721-11	CAL Check™ standard cuvettes
	HI 93721-01	Reagents for 100 tests
	HI 93721-03	Reagents for 300 tests

The reagents are in powder form and are supplied in packets. The amount of reagent is precisely dosed to ensure the maximum repeatability.

HI 38033

Hardness, Total (as CaCO₃) Test Kit

0-30 gpg range



Method	Range*	Smallest Increment	# Tests
titration	0-30 gpg	1 gpg	100
Ordering	HI 38033 test kit comes with 30 mL buffer solution, 10 mL calmagite indicator, 75 mL EDTA solution (2), 20 mL plastic beaker with cap and 1 mL plastic pipette.		

HI 3841

Hardness (as CaCO₃) Test Kit

Medium Range

Method	Range*	Smallest Increment	# Tests
titration	40-500 mg/L (ppm)	20 mg/L (ppm)	50 avg.
Ordering	HI 3841 test kit comes with 30 mL hardness MR reagent and 50 mL calibrated vessel.		

HI 38040

Iron (Fe²⁺ & Fe³⁺) Test Kit

Medium Range with Checker Disc



Method	Range*	Smallest Increment	# Tests
checker disc	0.0-5.0 mg/L (ppm)	0.1 mg/L (ppm)	100
Ordering	HI 38040 test kit comes with 100 packets iron reagent, checker disc, glass vials with caps (2) and 3 mL plastic pipette		

HI 38041

Iron (Fe²⁺ & Fe³⁺) Test Kit

High Range with Checker Disc



Method	Range*	Smallest Increment	# Tests
checker disc	0.0-10.0 mg/L (ppm)	0.2 mg/L (ppm)	100
Ordering	HI 38041 test kit comes with 100 packets iron reagent, 500 mL deionized water, checker disc, glass vials with caps (2), 3 mL plastic pipettes and long plastic pipette.		

Copper

Copper is an essential trace element in the human diet (the daily requirement is around 2.0 mg) and a factor in plant metabolism. On the other hand, corrosion of copper alloys in pipe fittings may introduce considerable quantities of copper into water supplies.

Fluoride

Fluoride is best known for preventing tooth decay. Water authorities often add fluoride to drinking water to maintain approximately a 1.0 mg/L (ppm) concentration. Fluoride can be found naturally in ground water, particularly if a reservoir is in the proximity of sea water. While fluoride does help prevent tooth decay, too little can be ineffective and too much can cause staining.

Hardness

Total hardness, that is the presence of magnesium and calcium, is due mainly to the runoff water dissolving these salts as it flows or filters through different strata. Hardness can also cause scaling of pipes in cooling and heating systems.

Iron

Iron is naturally present in water in low concentrations, but it reaches high concentrations in wastewater effluents. The iron concentration in water needs to be monitored because it becomes harmful above certain levels.

In domestic water, for instance, iron can cause an unpleasant taste, stain laundry, damage kitchenware and favor the growth of certain bacteria. Iron is also an indicator of ongoing corrosion in water cooling and heating systems. Moreover, iron is normally monitored in mining wastewater to avoid contamination.

HI 96748 • HI 96709C Manganese Portable Photometers

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features

The HI 96748 measures the low range manganese content in water and wastewater in the 0 to 300 µg/L (ppb) range.

The HI 96709C measures the high range manganese content in water and wastewater in the 0.0 to 20.0 mg/L (ppm) range.



Specifications	HI 96748 Manganese, Low Range	HI 96709C Manganese, High Range																		
Range	0 to 300 µg/L (ppb)	0.0 to 20.0 mg/L (ppm)																		
Resolution	1 µg/L (ppb)	0.1 mg/L (ppm)																		
Accuracy @ 25°C (77°F)	±10 µg/L ±3% of reading	±0.2 mg/L ±3% of reading																		
Ordering	HI 96748 and HI 96709C includes photometer, sample cuvettes (2) with caps, 9V battery, instrument quality certificate and instruction manual. HI 96709C also includes CAL Check™ standards, scissors, cuvette cleaning cloth and rigid carrying case. Reagents sold separately.																			
Reagents and Standards	<table border="1"> <tr> <td>HI 96748</td> <td>HI 96748-11</td> <td>CAL Check™ standard cuvettes</td> </tr> <tr> <td></td> <td>HI 93748-01</td> <td>Reagents for 50 tests</td> </tr> <tr> <td></td> <td>HI 93748-03</td> <td>Reagents for 150 tests</td> </tr> <tr> <td>HI 98709</td> <td>HI 96709-11</td> <td>CAL Check™ standard cuvettes</td> </tr> <tr> <td></td> <td>HI 93709-01</td> <td>Reagents for 100 tests</td> </tr> <tr> <td></td> <td>HI 93709-03</td> <td>Reagents for 300 tests</td> </tr> </table>	HI 96748	HI 96748-11	CAL Check™ standard cuvettes		HI 93748-01	Reagents for 50 tests		HI 93748-03	Reagents for 150 tests	HI 98709	HI 96709-11	CAL Check™ standard cuvettes		HI 93709-01	Reagents for 100 tests		HI 93709-03	Reagents for 300 tests	
HI 96748	HI 96748-11	CAL Check™ standard cuvettes																		
	HI 93748-01	Reagents for 50 tests																		
	HI 93748-03	Reagents for 150 tests																		
HI 98709	HI 96709-11	CAL Check™ standard cuvettes																		
	HI 93709-01	Reagents for 100 tests																		
	HI 93709-03	Reagents for 300 tests																		

The reagents are in powder form and are supplied in packets. The amount of reagent is precisely dosed to ensure the maximum repeatability.

HI 96728C Nitrate-Nitrogen Portable Photometer

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features

HI 96728C measures the nitrate content in water and wastewater..



Specifications								
Range	0.0 to 30.0 mg/L (ppm)							
Resolution	0.1 mg/L (ppm)							
Accuracy @ 25°C (77°F)	±0.5 mg/L ±10% of reading							
Ordering	HI 96728C includes photometer, CAL Check™ standards, sample cuvettes (2) with caps, 9V battery, scissors, cuvette cleaning cloth, instrument quality certificate, instruction manual and rigid carrying case. Reagents sold separately.							
Reagents and Standards	<table border="1"> <tr> <td>HI 96728-11</td> <td>CAL Check™ standard cuvettes</td> </tr> <tr> <td>HI 93728-01</td> <td>Reagents for 100 tests</td> </tr> <tr> <td>HI 93728-03</td> <td>Reagents for 300 tests</td> </tr> </table>	HI 96728-11	CAL Check™ standard cuvettes	HI 93728-01	Reagents for 100 tests	HI 93728-03	Reagents for 300 tests	
HI 96728-11	CAL Check™ standard cuvettes							
HI 93728-01	Reagents for 100 tests							
HI 93728-03	Reagents for 300 tests							

The reagents are in powder form and are supplied in packets. The amount of reagent is precisely dosed to ensure maximum repeatability.



HI 3874 Nitrate (as NO₃-N) Test Kit

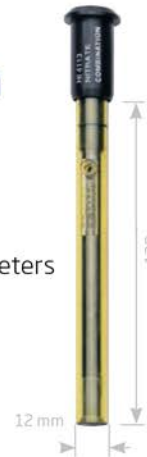
The Hanna HI 3874 determines Nitrate concentration via colorimetric method.

Method	Range*	Smallest Increment	# Tests
colorimetric	0-50 mg/L (ppm)	10 mg/L (ppm)	100
Ordering	HI 3874 test kit comes with 100 packets nitrate reagent, glass cuvette and color comparison cube.		

HI 4113 Nitrate Ion Selective Electrode

for use with
compatible ISE meters

ISE Solutions
See our compatible
ISE Solutions p. 40



Specifications	
Measurement Range	1.0M to 1X 10 ⁻⁴ M 6200 to 0.62 mg/L (ppm) 1400 to 0.4 mg/L (ppm) as N
Optimum pH Range	3.0 to 8
Temperature Range	0 to 40°C
Approximate Slope	-56
Body O.D.	12 mm
Insertion Length	120 mm
Body Material	PEI/PVC
Ordering	HI 4113 combination ISE with polymer membrane, 1m coaxial cable and BNC connection

Ion Selective Electrode Compatibility

Our Ion Selective Electrodes can be used with the following pH and Multiparameter benchtop meters:



HI 4222 p.20

Research grade pH/mV/ISE/Temp. benchtop meter with Calibration Check™ and 2 input channels.



HI 3222 p.21

pH/mV/ISE/Temp. benchtop meter with Calibration Check™ and 2 input channels.



HI 4522 p.30

Research grade multiparameter benchtop meter with Calibration Check™ and 2 input channels.



HI 3512 p.31

Multiparameter benchtop meter with Calibration Check™ and 2 input channels.



HI 98186 Dissolved Oxygen and BOD Meter

- Log On Demand up to 400 samples
- PC compatible via USB
- Meets Good Laboratory Practices
- Backlit, graphic LCD display
- On-screen context sensitive help
- Automatic barometric pressure compensation

and temperature compensations enhance the precision of your readings.

With its internal barometer, the instrument is able to automatically compensate for changes in barometric pressure so there is no need for charts, altitude information or external barometric pressure information.

Salinity compensation in water allows direct determination of dissolved oxygen in saline waters.

Other features include measurement and methods for BOD (biochemical oxygen demand), OUR (oxygen uptake rate), and SOUR (specific oxygen uptake rate).

HI 98186 portable Dissolved Oxygen Meter has extended ranges of up to 50 ppm or 600% saturation. This instrument includes barometric pressure measurement and calibration with a user-selectable unit (mmHg, atm, mbar, psi, kPa) as well as a 1 or 2-point temperature calibration. Salinity, pressure

Specifications

Dissolved Oxygen	Range	0.00 to 50.00 mg/L (ppm); 0.0 to 600.0 % saturation
	Resolution	0.01 mg/L (ppm); 0.1% saturation
	Accuracy (@20°C/68°F)	±1.5% of reading ±1 digit
	Calibration	automatic one or two point at 100% (8.26 mg/L) and 0% (0 mg/L); manual one point using a value entered by the user in % saturation or mg/L
Barometric Pressure	Range	450 to 850 mmHg
	Resolution	1 mm Hg
	Accuracy (@20°C/68°F)	± 3 mmHg within ±15% from the calibration point
	Calibration	one point at any in range pressure value
Temperature	Range	-20.0 to 120.0°C (-4.0 to 248.0°F)
	Resolution	0.1°C/°F
	Accuracy (@20°C/68°F)	±0.2°C/±0.4°F (excluding probe error)
	Calibration	one or two point at any in range temperature value
Ordering	HI 98186-01 (115V) is supplied with HI 76407/4F DO probe, spare membranes (2), HI 7041S electrolyte solution (30 mL), rechargeable batteries, HI 710042 inductive battery charger with power adapter, 12 VDC adapter, instructions and rugged carrying case.	

HI 96732 Dissolved Oxygen Portable Photometer

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features



The HI 96732 measures the content of dissolved oxygen (O₂) in surface, feed, natural and waste waters in the 0.0 to 10.0 mg/L (ppm) range.

Specifications

Range	0.0 to 10.0 mg/L (ppm)	
Resolution	0.1 mg/L (ppm)	
Accuracy @ 25°C (77°F)	±0.4 mg/L ±3% of reading	
Ordering	HI 96732 is supplied with sample cuvettes (2) with caps, 9V battery, instrument quality certificate and instruction manual CAL Check™ standards and testing reagents sold separately	
Reagents and Standards	HI 96732-11	CAL Check™ standard cuvettes
	HI 93732-01	Reagents for 100 tests
	HI 93732-03	Reagents for 300 tests

The reagents are in liquid form and are supplied in bottles. The amount of reagent is precisely dosed to ensure maximum repeatability.



HI 3810 Dissolved Oxygen Test Kit

The Hanna dissolved oxygen portable test kit can determine the oxygen concentration in water quickly and easily.

Specifications

Method	Range*	Smallest Increment	# Tests
titration	0.0-10.0 mg/L (ppm)	0.1 mg/L (ppm)	110 avg.
Ordering	HI 3810 test kit comes with 30 mL manganous sulfate solution, 30 mL alkali-azide reagent, 60 mL sulfuric acid solution (2), 10 mL starch indicator, 120 mL titrant solution, glass bottle with stopper, 10 mL calibrated vessel and calibrated syringe with tip.		

Phenols

Phenols are widely used in pharmaceuticals, dyes and indicators and as general disinfectants. They may occur in household and industrial wastewaters and in natural waters; they can also enter potable water supplies and chlorination of such waters results in malodorous chlorophenol products that are detectable from 0.001 mg/L (1 ppb).

Phosphate

Phosphates are present in a number of products that are used everyday. Some examples of the effects of phosphates are enhancing the flavor and tartness of cola drinks, as a buffering agent in controlling pH in antifreeze and delaying darkening of cut potatoes used in making French fries.

Phosphates are also extensively used in detergents and cleaning fluids because of their ability to soften water and remove soil deposits.

The largest use of phosphates is in the conversion of the mineral apatite, which is a mixture of calcium phosphate and other calcium compounds that are used in fertilizers.

Phosphates are particularly important for the growth and development of plant roots, and hence are one of the most common fertilizers used in agriculture.

However, high concentrations of phosphates in agricultural runoff can cause environmental pollution, as they are a primary cause of eutrophication. Local laws govern the use of phosphates and the discharge levels into streams.

Phosphates are also utilized in detergents and are needed, in small quantities, for heating systems.

For these reasons, it is necessary to closely monitor the phosphate levels present in both municipal and industrial waste water.

Sulfate

Sulfate is widely present within natural waters in different concentrations. Sulfate concentration is to be kept within a strict range for drinking water, especially since this value can be high near mine drainage points.

Zinc

Zinc is widely used in alloys (brass, bronze, and dye-casting alloys), in galvanizing iron and other metals, and also as a fungicide. It is also an essential growth element in human diet. But with concentrations higher than 5 mg/L, it gives a bitter taste to water and opalescence to alkaline water.

Zinc can enter the domestic water supply from the deterioration of galvanized iron and dezincification of brass.

HI 96713C Phosphate Portable Photometer

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features

The HI 96713 measures phosphate (PO₄³⁻) content in water, wastewater and seawater in the 0.00 to 2.50 mg/L (ppm) range.

Specifications

Range	0.00 to 2.50 mg/L (ppm)		
Resolution	0.01 mg/L (ppm)		
Accuracy @ 25°C (77°F)	±0.04 mg/L ±4% of reading		
Ordering	HI 96713C includes photometer, CAL Check™ standards, sample cuvettes (2) with caps, 9V battery, scissors, cuvette cleaning cloth, instrument quality certificate, instruction manual and rigid carrying case. Reagents sold separately.		
Reagents and Standards	HI 96713-11	CAL Check™ standard cuvettes	
	HI 93713-01	Reagents for 100 tests	
	HI 93713-03	Reagents for 300 tests	

The reagents are in powder and liquid form and are supplied in packets and bottles. The amount of reagent is precisely dosed to ensure the maximum repeatability.



HI 96 Series Photometers

See more about our HI 96 series photometers p. 6

HI 96751C Sulfate Portable Photometer

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features

The HI 96751 measures the sulfate content in water samples in the 0 to 150 mg/L (ppm) range.

Specifications

Range	0 to 150 mg/L (ppm)		
Resolution	1 mg/L (ppm)		
Accuracy @ 25°C (77°F)	±1 mg/L ±5% of reading		
Ordering	HI 96751C includes photometer, CAL Check™ standards, sample cuvettes (2) with caps, 9V battery, scissors, cuvette cleaning cloth, instrument quality certificate, instruction manual and rigid carrying case. Reagents sold separately.		
Reagents and Standards	HI 96751-11	CAL Check™ standard cuvettes	
	HI 93751-01	Reagents for 100 tests	
	HI 93751-03	Reagents for 300 tests	



HI 3864 Phenols Test Kit

The Hanna test kit for phenols determines the phenol concentration in water via checker disc.

Specifications

Method	Range	Smallest Increment	# Tests
Checker Disc	0.00-1.00 mg/L (ppm)	0.02 mg/L	100
	0.5-5.0 mg/L (ppm)	0.1 mg/L	
Ordering	HI 3864 test kit comes with 100 packets reagent A, 100 packets reagent B, checker discs (2), glass vials with caps (2) and mirror.		

HI 4115 Silver/Sulfide Ion Selective Electrode

for use with compatible ISE meters

ISE Solutions
See our compatible ISE Solutions



Specifications

Measurement Range	Ag+ 1.0M to 1X 10 ⁻⁶ M 107900 to 0.11ppm S ²⁻ 1.0M to 1X 10 ⁻⁶ M 32100 to 0.003 ppm
Optimum pH Range	Ag+ 2 to 8 S ²⁻ 12 to 14
Temperature Range	0 to 80°C
Approximate Slope	+56 Ag+ / -28 S ²⁻
Body O.D.	12 mm
Insertion Length	120 mm
Body Material	PEI
Ordering	HI 4115 solid-state; combination ISE with 1m coaxial cable and BNC connection

HI 96731 Zinc Portable Photometer

- CAL Check™
- BEPS (Battery Error Prevention System)
- GLP Features

The HI 96731 measures the zinc content in water and wastewater in the 0.00 to 3.00 mg/L (ppm) range.



Specifications

Range	0.00 to 3.00 mg/L (ppm)						
Resolution	0.01 mg/L (ppm)						
Accuracy @ 25°C (77°F)	±0.03 mg/L ±3% of reading						
Ordering	HI 96731 includes photometer, sample cuvettes (2) with caps, 9V battery, cuvette cleaning cloth, instrument quality certificate, instruction manual and rigid carrying case. CAL Check™ standards and testing reagents sold separately						
Reagents and Standards	<table border="1"> <tr> <td>HI 96731-11</td> <td>CAL Check™ standard cuvettes</td> </tr> <tr> <td>HI 93731-01</td> <td>Reagents for 100 tests</td> </tr> <tr> <td>HI 93731-03</td> <td>Reagents for 300 tests</td> </tr> </table>	HI 96731-11	CAL Check™ standard cuvettes	HI 93731-01	Reagents for 100 tests	HI 93731-03	Reagents for 300 tests
HI 96731-11	CAL Check™ standard cuvettes						
HI 93731-01	Reagents for 100 tests						
HI 93731-03	Reagents for 300 tests						

The reagents are in liquid and powder form and are supplied in bottles and in packets. The amount of reagent is precisely dosed to ensure maximum repeatability.

HI 93510N Thermistor Thermometer

- HOLD Key to Freeze Readings on Display
- Battery Error Prevention System (BEPS)
- Battery Level Indicator at Startup
- Backlit Display
- Waterproof
- User calibration

HI 93510N is a waterproof thermometer tailored for the lab and field. The LCD displays the highest and lowest readings in the cycle along with the current temperature.

The HI 93510N also offers a CAL button to allow the operator to calibrate the meter and probe in an ice bath at 0°C.



Specifications

Range	-50.0 to 150.0°C; -58.0 to 302.0°F
Resolution	0.1°C; 0.1°F (-58.0 to 230.0°F) and 0.2°F (outside)
Accuracy	±0.4°C; ±0.8°F (for 1 year, excluding probe error)
Ordering	HI 93510N is supplied with HI 762BL air/liquid stainless steel thermistor temperature probe, batteries and instructions.

HI 147 Checkridge™ Remote Sensor Thermometer

- CAL Check™ verification at 0°C
- BEPS (Battery Error Prevention System)
- Magnetic backing
- Stainless steel thermistor probe on 1m (3.3') cable

The Hanna HI 147 Checkridge™ is the ideal thermometer for accurate, reliable internal temperature readings.

Specifications HI 147-00 Checkridge™ C

Range	-50.0 to 150.0°C
Resolution	0.1°C
Accuracy	±0.3°C (-20 to 90°C); ±0.5°C (outside)
Ordering	HI 147-00 (Checkridge™ C) is supplied with battery and instructions.

HI 98501 Checktemp® Digital Thermometer

- Large display
 - The large display features a wide environmental temperature range and viewing angle.
- CAL Check™
 - Automatically verifies calibration at startup and alerts the user of the calibration status.
- IP 65 water resistant protection
- AISI 316 stainless steel penetration probe
- °C and °F measurement in one tester

The Checktemp® delivers high accuracy temperature measurements over a wide temperature range without worrying about breakage or condensation.

Specifications	°C	°F
Range	-50.0 to 150.0°C	-58.0 to 302.0°F
Resolution	0.1°C	0.1°F (58.0 to 199.9°F); 1°F (200 to 302°F)
Accuracy	±0.3°C (-20 to 90°C) ±0.5°C (outside)	±0.5°F (-4 to 194°F) ±1°F (outside)
Ordering	HI 98501 (Checktemp®) is supplied with penetration probe, protective cap, battery and instructions.	

