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### Laboratory Accuracy in the Field

In the past, measuring and monitoring important parameters was limited to the laboratory. Now, these parameters are being tested right in the field for applications such as environmental study, agriculture, the food industry, horticulture, wastewater management, fish farming, water quality maintenance and anywhere quality and accuracy is important. Hanna has developed a large variety of testers and monitors designed to fulfill the requirements of virtually any application.

Hanna offers a vast selection of single and multiparameter testers which cover a multitude of the most important parameters: pH, ORP, conductivity (EC), total dissolved solids (TDS), temperature, sodium, salt and relative humidity.

Testers can perform on the spot measurements quickly, accurately and inexpensively. They allow users with different backgrounds and technical training to make readings without the need of a laboratory or having to purchase expensive and complex analytical equipment.

Hanna provides high accuracy in a single parameter tester for pH, EC, TDS, temperature and more. Multiparameter testers are also available, eliminating the hassle of carrying multiple testers.

Hanna testers have easy to read LCDs and durable outer casings. They are able to measure in places with a high percentage of humidity, and low power demand allows a long battery life, eliminating the need for frequent battery replacement.

### pH Testers

All Hanna pH testers come with a replaceable pH probe, which is a unique advantage over most pH testers found on the market today. Clogged electrode junctions are a problem of the past with extendable cloth junctions. When the cloth is dirty from routine testing, readings can become slow and unstable. This can be fixed by simply pulling out 3 mm of cloth, and cutting off the dirty junction.

Testers feature Automatic Temperature Compensation (ATC) and calibration at one or two points. Designed to be pocket sized with a narrow tip, they are ideal for measurements in smaller samples.

### Conductivity Testers

Conductivity (EC) testers are widely used for monitoring EC/TDS in water conditioning, reverse osmosis, cooling towers, drinking water, wastewater, laboratories, agriculture, aquaculture and aquariums, hydroponics and the printing industry.

With selectable or fixed conversion factors to relate to EC and TDS, readings can be more accurate. Hanna conductivity testers feature an amperometric graphite probe that provides greater accuracy and repeatability in measurements because it cannot be contaminated by salt deposits in solutions. Calibration of conductivity testers is simple and can be done manually or automatically with a single point.

Measurements are automatically temperature compensated to ensure correct readings.

### Salt and Water Purity Testers

The SALINTEST can help you monitor the concentration of sodium chloride in live fish storage tanks, tropical fish aquariums and oceanographic investigations. Measurements are performed with a sodium ion selective electrode, with one point check in a standard salt solution.

Water purity testers enable users to check the purity of distilled or demineralized water in environments such as printed circuit board washing, laundry, steam cleaning, and all areas where pure water is used. The measurement for salt and water purity is conductometric.

### Thermometers

Hanna's thermometers feature a unique CAL Check™ function to ensure accurate measurements every time. Hanna temperature sensors allow users to take measurements with extremely high accuracy in a short amount of time. The sharp tip of the probes can easily penetrate semi-solid products, making routine controls simple and quick. These testers are ideal meters for measuring temperature according to HACCP requirements.

## Hanna Monitors

Hanna monitors are an ideal economical solution in applications where constant monitoring of a stationary sample is required. Hanna offers a large selection of wall-mountable monitors that cover a multitude of parameters, allowing the user to choose the meter and probe that best fits their application. Multiparameter models allow the user to monitor up to three different parameters with one indicator.

Each monitor is designed for specific application requirements such as in hydroponics, greenhouses, horticulture, water treatment and food preparation and processing.

At startup, monitors perform a self-check diagnostic to assure proper working condition. Stability indicators let the user know when to take readings while the HOLD function freezes readings on the display for easy and accurate recording. Selected instruments in this line provide a visual alarm so the user can easily recognize if the monitored solution is out of specification for the application.

Hanna offers monitors that feature large backlit LCDs for easy visual reading of multiple parameters as well as automatic calibration, automatic buffer selection and automatic temperature compensation (ATC).

Hanna's wall-mounted monitors are very easy to install and work with a 12V power supply. Many models feature interchangeable probes so an application specific probe can easily be plugged in to the meter. All monitors have durable outer casings protecting them from high humidity environments and rain.

### pH Monitors

Ideal for growers, pH monitors are supplied with advanced, non-clogging double junction pH electrodes that will withstand the most aggressive environments. Measurements are highly accurate and can be verified with one or two-point manual or automatic calibration.

Should the pH exceed a user-selected limit, an incorporated LED will alert the user with a flashing light. This feature allows even inexperienced users to successfully monitor parameters. The LED alarm and pH value can be set through trimmers on the instrument.

### Conductivity Monitors

Conductivity monitors with different measurement ranges are available with a host of features suited for aggressive environments.

Calibration and temperature compensation can be automatic or manual, while the EC/TDS conversion factor and temperature coefficient factor ( $\beta$ ) are user-adjustable. If desired, the most common TDS conversion factor of 0.5 can be used for agriculture measurements on application specific measurements. Both the direct two pin probes and graphite probes assure great accuracy and minimal maintenance.

### ORP Monitors

Hanna has developed oxidation-reduction (ORP) monitors specially for swimming pool and spa facilities where monitoring is crucial. Casings incorporate a large, bright LED indicator that will flash if measurements fall below the user-selected value.

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## Temperature Monitors

Few manufacturers have given any thought to providing users with a convenient way of monitoring temperature conditions in catering, refrigerators, and other places that need quick monitoring. Hanna's precision thermometers can be mounted right over the samples to be measured or placed in refrigerators for continuous readings of cold storage products.

Temperature monitors come with Hanna's exclusive CAL Check™ feature. With CAL Check™, users can ensure the accuracy of the meter without the need for external calibration equipment.

Food grade stainless steel probes and quick response times assure the safety and preservation of the goods monitored.



## Product Spotlights

HI98131

### GroLine pH/EC/TDS Combo Tester

The HI98131 GroLine Combo offers high accuracy pH, EC (conductivity), TDS (total dissolved solids), and temperature measurements in a rugged, waterproof casing that floats.

See page 1.10

HI98107 pHep® · HI98108 pHep®+

### pHep pH Testers

The pHep® is used by millions of people around the world to monitor pH in laboratories and industrial applications as well as in agriculture, fish farming, food manufacturing and quality control, swimming pools and the printing industry.

See page 1.14

HI98118

### GroLine pH Tester

The GroLine waterproof EC/TDS tester is ideal for hydroponics, greenhouses, or anywhere you need quick and accurate conductivity measurements.

See page 1.15

HI98115

### GroLine pH Tester

The HI98115 GroLine pH tester has been designed with many advanced features for growers of all types. This pH tester offers automatic calibration to one or two points, automatic buffer recognition, calibrated buffer tags, stability indicator, low battery indicator, and selectable automatic shut-off. With its compact size, one-button operation, and ease of calibration, the HI98115 is the optimal tool for pH measurement in nutrient solutions and soil slurries.

See page 1.18



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HI98331 Soil Test™

## Soil Test

*Direct Soil EC and Temperature Meter with Built-in Stainless Steel EC Probe*

The GroLine Soil Test EC (conductivity) and temperature tester offers many advanced features for growers of all types. The Soil Test offers automatic one-point calibration, stability indicator, hold functions to freeze readings on screen, low battery indicator, and selectable automatic shut-off.

With its compact size, single-button operation, and ease of calibration, Soil Test is the optimal tool for EC measurements made directly in soil.

See page 1.23

DiST®: HI98301 · HI98302 · HI98303 HI98304

## EC and TDS Testers

The DiST® family of testers is widely used for monitoring EC/TDS in drinking water, water conditioning, reverse osmosis, cooling towers, wastewater, laboratories, agriculture, aquaculture and aquariums, hydroponics and the printing industry.

See page 1.24

HI98318

## GroLine EC/TDS Tester

The GroLine waterproof EC/TDS tester is ideal for hydroponics, greenhouses, or anywhere you need quick and accurate conductivity measurements.

See page 1.25



Code	pH Range	EC Range	TDS Range	ORP Range	Salinity Range	Temperature Range(s)	0.01 pH Resolution	Automatic Calibration	Automatic EC Calibration	pH Calibration Points	EC/TDS Calibration Points	Quick Cal Calibration Solution Compatible	pH Buffer Sets	ATC	Waterproof	Replaceable Electrode/Probe	Cloth Extendable Junction	HOLD Function	BEPS	Auto-off	Page
<b>Multiparameter</b>																					
HI98129	•	•	•			°C/°F	•	•	•	2	1		2	•	•	•	•	•	•	•	1.8
HI98130	•	•	•			°C/°F	•	•	•	2	1		2	•	•	•	•	•	•	•	1.8
HI98131	•	•	•			°C/°F	•	•	•	2	1	•	2	•	•	•	•	•	•	•	1.10
<b>pH/ORP</b>																					
HI98127	•					°C/°F		•		2			2	•	•	•	•	•	•	•	1.12
HI98128	•					°C/°F	•	•		2			2	•	•	•	•	•	•	•	1.12
HI98111	•									2				•		•					1.13
HI98112	•									2				•		•					1.13
HI98113	•					°C	•			2				•		•					1.13
HI98107	•					°C/°F		•		2					•		•			•	1.14
HI98108	•					°C/°F	•	•		2				•	•		•			•	1.14
HI98118	•					°C/°F	•	•		2		•		•	•		•			•	1.15
HI98100	•									2						•				•	1.16
HI98103	•									2							•			•	1.16
HI98115	•									2							•			•	1.18
HI98120			•			°C/°F									•	•		•	•	•	1.20
HI98121	•		•			°C/°F	•			2			2	•	•	•	•	•	•	•	1.20
HI98201			•																		1.21
<b>EC/TDS</b>																					
HI98203					•						1										1.21
HI98311	•	•				°C/°F		•		1				•	•	•		•	•	•	1.22
HI98312	•	•				°C/°F		•		1				•	•	•		•	•	•	1.22
HI98331	•					°C/°F		•		1				•		•				•	1.23
HI98301			•			°C/°F		•		1				•	•					•	1.24
HI98302			•			°C/°F		•		1				•	•					•	1.24
HI98303	•					°C/°F		•		1				•	•					•	1.24
HI98304	•					°C/°F		•		1				•	•					•	1.24
HI98318	•	•				°C/°F		•		1	•			•	•					•	1.25
Primo			•						•	1				•						•	1.26
Primo 5	•							•		1				•						•	1.26
Primo 4	•							•		1				•						•	1.26
HI98308	•									1						•					1.27
HI98309	•																				1.27

Code	pH Range	EC Range	TDS Range	ORP Range	Temperature Range(s)	pH Calibration Points	pH Buffer Sets	Automatic Calibration	pH Temperature Compensation	EC Temperature Compensation	TDS Temperature Compensation	CAL Check™	Waterproof	HOLD Function	Backlit LCD	12 VDC Power Supply	Battery Power	Visual Alarm	Auto-off	Page
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## Temperature

HI98501					°C/°F							•							•	1.28
HI98509					°C/°F							•							•	1.30
HI98539					°C/°F							•							•	1.31
HI151-00					°C							•							•	1.32
HI151-01					°F							•							•	1.32
HI145-00					°C							•							•	1.33
HI145-01					°F							•							•	1.33
HI145-20					°C							•							•	1.33
HI145-30					°F							•							•	1.33
HI98517					°C															1.34

## Monitors

HI991404	•	•	•		°C/°F	2	2	•	•	•	•	•	•	•	•	•				1.35
HI991405	•	•	•		°C/°F	2	2	•	•	•	•	•	•	•	•	•				1.35
HI981504/5	•		•		°C/°F	2					•				•	•				1.36
HI981504/7	•		•		°C/°F	2					•				•	•				1.36
HI981404N	•		•			2					•					•				1.37
HI981405N	•	•				2				•						•				1.37
HI991401	•				°C/°F	2	2	•	•				•	•	•	•				1.38
HI981401N	•					2										•				1.39
HI981402	•					2										•		•		1.40
HI993301		•	•		°C/°F			•		•	•		•	•	•	•				1.41
HI993302		•	•		°C/°F			•		•	•		•	•	•	•				1.42
HI983302N		•								•						•				1.40
HI983307		•								•						•		•		1.43
HI983304		•								•						•		•		1.44
HI146-00					°C												•			1.45
HI147-00					°C												•			1.45
HI147-01					°F												•			1.46

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HI98129 (Combo) · HI98130 (Combo)

## pH/EC/TDS Testers

- **Waterproof**
  - Designed to float if accidentally dropped in a tank
- **Automatic Temperature Compensation**
  - All readings are compensated for variations in temperature
  - Temperature displayed in °C or °F along with pH reading
- **Stability indicator**
  - Meter displays a clock tag that will disappear when the reading has achieved stability
- **HOLD button**
  - Freezes reading on the display to allow recording of measurement
- **BEPS (Battery Error Prevention System)**
  - Meter will automatically shut off if there is not enough power to get an accurate measurement
- **Battery % level at startup**
- **Low Battery Indicator**
- **Auto-off**
  - Automatically shuts off after 8 minutes of non-use to maximize battery life



The HI98129 and HI98130 are waterproof testers that offer high accuracy pH, EC/TDS and temperature measurements in a single tester; no more switching between meters for your routine measurements. These floating, waterproof combination testers have an easy-to-read LCD and an automatic shut-off. pH and EC/TDS readings are automatically temperature-compensated.

These testers feature a replaceable pH electrode cartridge with an extendable cloth junction, as well as an EC/TDS graphite electrode. The renewable cloth junction provides an extended electrode life and the replaceable pH cartridge means that this tester does not need to be thrown away when the pH sensor is exhausted.

The EC/TDS conversion factor is user-selectable, as well as the temperature compensation coefficient ( $\beta$ ).

Fast, efficient, accurate and portable, the Combo pH, EC/TDS and temperature testers combine all the features users have requested and more!



### Replaceable pH electrode cartridge

The Combo features an easy-to-replace pH electrode. The sturdy, snap-in connector means there are no pins to bend or break.

### High accuracy EC/TDS graphite probe

The graphite conductivity probe provides greater accuracy because it cannot be contaminated by salt deposits in the solution. The exposed temperature sensor provides fast response times and guarantees highly accurate temperature compensated readings.



### Extendable cloth junction

Simply pull out 3 mm (1/8") and cut when the cloth junction becomes dirty to improve response time and stability.



## LCD Display Features



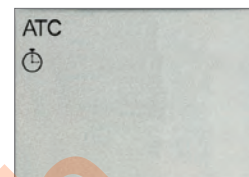
### On-screen battery life

LCD indicates the percentage of battery power remaining upon startup.



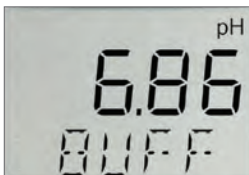
### HOLD function

The HOLD function “freezes” the LCD display temporarily.



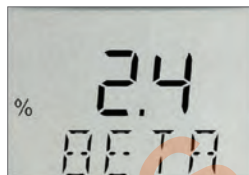
### Instability & ATC indicators

Ensures reliable EC and TDS measurements. ATC symbol is shown when active.



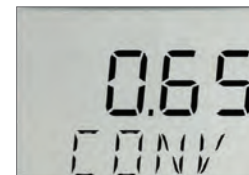
### Standard or N.I.S.T buffer calibration

Automatic calibration is performed with two sets of memorized buffers for greater accuracy.



### Adjustable temperature coefficient factor

Users can choose between different factors ( $\beta$ ) for precise temperature compensated measurements.



### Adjustable TDS conversion factor

For measurement accuracy, users can choose between a range of conductivity to TDS conversion factors.

Specifications		HI98129	HI98130
pH	Range	0.00 to 14.00 pH	0.00 to 14.00 pH
	Resolution	0.01 pH	0.01 pH
	Accuracy	±0.05 pH	±0.05 pH
Conductivity	Range	0 to 3999 $\mu$ S/cm	0.00 to 20.00 mS/cm
	Resolution	1 $\mu$ S/cm	0.01 mS/cm
	Accuracy	±2% F.S.	±2% F.S.
TDS	Range	0 to 2000 mg/L (ppm)	0.00 to 10.00 g/L (ppt)
	Resolution	1 mg/L (ppm)	0.01 g/L (ppt)
	Accuracy	±2% F.S.	±2% F.S.
Temperature	Range	0.0 to 60.0°C / 32.0 to 140.0°F	0.0 to 60.0°C / 32.0 to 140.0°F
	Resolution	0.1°C / 0.1°F	0.1°C / 0.1°F
	Accuracy	±0.5°C / ±1°F	±0.5°C / ±1°F
Additional Specifications	EC/TDS Calibration	automatic, one point at 1413 $\mu$ S/cm or 1382 mg/L (ppm)	automatic, one point at 12.88 mS/cm or 6.44 g/L (ppt)
	pH Calibration	automatic, one or two-point with two sets of standard buffers (pH 4.01 / 7.01 / 10.01 or 4.01 / 6.86 / 9.18)	
	Temperature Compensation	pH: automatic; EC/TDS: automatic with $\beta$ adjustable from 0.0 to 2.4% / °C	
	TDS Conversion Factor	0.45 to 1.00	
	pH Electrode	HI73127 (replaceable; included)	
	Environment	0 to 50°C (32 to 122°F); RH max 100%	
	Battery Type / Life	1.5V (4) / approx. 100 hours of continuous use; auto-off after 8 minutes of non-use	
Ordering Information	Dimensions / Weight	163 x 40 x 26 mm (6.4 x 1.6 x 1.0") / 100 g (3.5 oz.)	
		<b>HI98129</b> (Combo) and <b>HI98130</b> (Combo) are supplied with HI73127 pH electrode and HI73128 electrode removal tool, batteries and instructions.	



### Calibrate directly in buffer solution sachets

An easy calibration can be performed right in our buffer solution sachets for the most accurate readings.

HI98131

# GroLine pH/EC/TDS Combo Tester

- **Waterproof**
  - Designed to withstand the humidity of a growing environment
- **Automatic one-point calibration** using our Quick Cal solution
- **Automatic Temperature Compensation**
  - All readings are compensated for variations in temperature
  - Temperature displayed in °C or °F along with pH reading
- **Measurement instability indicator**
  - Meter displays a clock tag that will disappear when the reading has achieved stability
- **HOLD button**
  - Freezes reading on the display to allow recording of measurement
- **BEPS (Battery Error Prevention System)**
  - Meter will automatically shut off if there is not enough power to get an accurate measurement
- **Battery % level at startup**
- **Low Battery Indicator**
- **Auto-off**
  - Automatically shuts off after 8 or 60 minutes of non-use to maximize battery life

The HI98131 GroLine Combo offers high accuracy pH, EC (conductivity), TDS (total dissolved solids), and temperature measurements in a rugged, waterproof casing that floats.

The GroLine Combo features a replaceable pH electrode with extendable cloth junction as well as an EC/TDS graphite electrode. The renewable cloth junction provides an extended electrode life and the replaceable pH cartridge means that this tester does not need to be thrown away when the pH sensor is exhausted.

The EC/TDS conversion factor is user-selectable, as well as the temperature compensation coefficient ( $\beta$ ).



*GroLine*



## Pocket Clip

A pocket clip is featured on the back of the the GroLine Combo



## Supplied complete

Supplied with all the tools necessary to start performing tests

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### High accuracy EC/TDS graphite probe

The graphite conductivity probe provides greater accuracy because it cannot be contaminated by salt deposits in the solution. The exposed temperature sensor provides fast response times and guarantees highly accurate temperature compensated readings.



### Replaceable pH electrode cartridge

The Combo features an easy-to-replace pH electrode. The sturdy, snap-in connector means there are no pins to bend or break.



### Extendable cloth junction

Simply pull out 3 mm (1/8") and cut when the cloth junction becomes dirty to improve response time and stability.

## Specifications

### HI98131

pH	Range	0.00 to 14.00 pH
	Resolution	0.01 pH
	Accuracy	±0.01 pH
	Calibration	automatic, one or two-point calibration (using pH 4.01, 7.01, 10.01 buffers); one-point calibration using HI5036 or HI50036 Quick Cal calibration solution
	Temperature Compensation	automatic
EC	Range	0.00 to 6.00 mS/cm
	Resolution	0.01 mS/cm
	Accuracy	±2% F.S.
	Calibration	automatic, one-point at 1.41 mS/cm or 5.00 mS/cm; one-point calibration using Quick Cal calibration solution
	Temperature Compensation	automatic, with $\beta = 1.9\%/^{\circ}\text{C}$
TDS	Range	0 to 3000 ppm (500 CF); 0 to 3999 ppm (700 CF)
	Resolution	10 ppm (mg/L)
	Accuracy	±2% F.S.
	Conversion Factor**	0.5 (500 ppm) or 0.7 (700 ppm)
Temperature	Range*	0.0 to 60.0°C / 32.0 to 140.0°F
	Resolution	0.1°C / 0.1°F
	Accuracy	±0.5°C / ±1°F
Additional Specifications	pH Electrode	HI73127 (replaceable; included)
	Environment	0 to 50°C (32 to 122°F); RH max 100%
	Battery Type / Life	1.5V (4) / approx. 100 hours of continuous use; auto-off after 8 min or 60 min of non-use; can be disabled
	Dimensions / Weight	163 x 40 x 26 mm (6.4 x 1.6 x 1.0") / 100 g (3.5 oz.)

### Ordering Information

**HI98131** (GroLine Combo) is supplied with HI73127 pH electrode, electrode removal tool, Quick Cal calibration solution sachets (4), electrode cleaning solution sachet, batteries, storage cap, quality certificate and instruction manual.



### Calibrate pH and EC with one solution

Calibration of both pH and EC can be performed using our Quick Cal calibration solution

HI98127 (pHep®4) · HI98128 (pHep®5)

# pH and Temperature Testers

- **Waterproof**
  - Designed to float if accidentally dropped in a tank
- **Automatic Temperature Compensation**
  - All readings are compensated for variations in temperature
  - Temperature displayed in °C or °F along with pH reading
- **Stability indicator**
  - Meter displays a clock tag that will disappear when the reading has achieved stability
- **HOLD button**
  - Freezes reading on the display to allow recording of measurement
- **BEPS (Battery Error Prevention System)**
  - Meter will automatically shut off if there is not enough power to get an accurate measurement
- **Battery % level at startup**
- **Low Battery Indicator**
- **Automatic Shut-Off**
  - The meter can be set to automatically turn off after 8 minutes or 60 minutes to conserve battery life in the event that the meter is left on. The auto off feature can be disabled.



The pHep®4 and pHep®5 are waterproof pH testers that have many advanced features found in more expensive portable instrumentation. These ergonomic meters feature automatic one or two point calibration to a known buffer, automatic temperature compensation, battery percent level indicator at start up, and a stability indicator to alert the user when a stable reading has been obtained. The large multi level LCD display shows both pH and temperature simultaneously.



These meters also feature the HI73127 replaceable electrode with a stainless steel round connector and extendable cloth junction. This cartridge design has no pins to line up or that can break.

Specifications		HI98127 (pHep®4)	HI98128 (pHep®5)
pH	Range	-2.0 to 16.0 pH	-2.00 to 16.00 pH
	Resolution	0.1 pH	0.01 pH
	Accuracy	±0.1 pH	±0.05 pH
Temperature	Range	-5.0 to 60.0°C / 23.0 to 140.0°F	-5.0 to 60.0°C / 23.0 to 140.0°F
	Resolution	0.1°C / 0.1°F	0.1°C / 0.1°F
	Accuracy	±0.5°C / ±1°F	±0.5°C / ±1°F
Additional Specifications	pH Calibration	automatic, one or two-point with two sets of standard buffers (pH 4.01 / 7.01 / 10.01 or pH 4.01 / 6.86 / 9.18)	
	Temperature Compensation	automatic	
	Battery Type / Life	1.5V (4) / approx. 300 hours of continuous use; auto-off after 8 minutes of non-use	
	Environment	-5 to 50°C (23 to 122°F); RH max 100%	
	Dimensions	163 x 40 x 26 mm (6.4 x 1.6 x 1.0")	
	Weight	100 g (3.5 oz.)	
Ordering Information		HI98127 (pHep®4) and HI98128 (pHep®5) are supplied with HI73127 pH electrode, HI73128 electrode removal tool, batteries and instructions.	

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## Stick pH Tester

- Pre-amplified electrode
- Narrow, replaceable probe
- Easy to hold and operate

PICCOLO® is a revolutionary pH meter with a 4-in-1 amplified electrode.

Conventional pH meters are susceptible to the weak, high impedance signal which makes the electrode, connector, cable and meter vulnerable to noise, humidity and dirty environments. PICCOLO® has overcome these problems with a pre-amplified electrode that delivers a strong signal to the meter. The interchangeable electrode is inexpensive, rugged and houses the pH sensor, reference system, temperature sensor and the amplifier module.

**PICCOLO®** with a 9 cm (3.5") electrode (HI1280).

**PICCOLO® 2** with a 16 cm (6.3") electrode (HI1290).

**PICCOLO® plus** with a 16 cm (6.3") electrode (HI1295) and temperature readout on LCD.

Specifications	HI98111 (PICCOLO®)	HI98112 (PICCOLO®2)	HI98113 (PICCOLO® plus)	
pH	Range	1.00 to 13.00 pH	1.00 to 13.00 pH; 0.0 to 70.0°C	
	Resolution	0.01 pH	0.01 pH	0.01 pH; 0.1°C
	Accuracy (@25°C/77°F)	±0.01 pH	±0.01 pH	±0.01 pH; ±1°C
Additional Specifications	Electrode	HI1280	HI1290	HI1295
	Calibration	manual, two-point	manual, two-point	manual, two-point
	Temperature Compensation	automatic, 0 to 70°C (32 to 158°F)		
	Battery Type / Life	1.5V (3) / approximately 100 hours of continuous use		
	Environment	0 to 50°C (32 to 122°F); RH max 95%		
	Dimensions (with electrode)	194 x 29 x 15 mm (7.6 x 1.1 x 0.6")	265 x 29 x 15 mm (10.4 x 1.1 x 0.6")	265 x 29 x 15 mm (10.4 x 1.1 x 0.6")
	Weight	70 g (2.5 oz.)		
Ordering Information	All PICCOLO® models are supplied complete with pH electrode, pH 4.01 and pH 7.01 buffer solution sachets, calibration screwdriver, batteries, rugged carrying case and instructions.			
	HI98111 (PICCOLO®) is supplied with 90 mm (3.5") HI1280 amplified pH electrode.			
	HI98112 (PICCOLO®2) is supplied with 160 mm (6.3") HI1290 amplified pH electrode.			
	HI98113 (PICCOLO® plus) is supplied with HI1295 amplified electrode with temperature sensor.			

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HI98107 pHep® · HI98108 pHep+

## pHep pH Testers

- Waterproof
- Extractable cloth junction to extend pH electrode life
- Built in temperature sensor for Automatic Temperature Compensated measurements.
- Automatic one or two-point calibration
- Stability indicator
- Low battery indicator
- Two-Button operation

The pHep is used by millions of people around the world to monitor pH in laboratories and industrial applications as well as in agriculture, fish farming, food manufacturing and quality control, swimming pools and the printing industry.

With a renewable cloth junction, the pHep has an extended life over typical pH testers. A normal junction clogs with use over time and a typical tester would normally have to be thrown away once the junction becomes contaminated. The junction is 2 cm long and when dirty, can be pulled out to expose a fresh section to effectively renew the pHep's life.



### Exposed temperature sensor

HI98108 features an exposed temperature sensor for faster response times.



### Watertight seal

An easily removable cover provides access to the battery compartment.



### Specifications

		HI98107 (pHep®)	HI98108 (pHep®+)
pH	Range	0.0 to 14.0 pH	0.00 to 14.00 pH
	Resolution	0.1 pH	0.01 pH
	Accuracy (@25°C/77°F)	±0.1 pH	±0.05 pH
	Calibration	automatic, two-points	
Temperature	Range	0.0 to 50.0 °C	0.0 to 50.0 °C
	Resolution	0.1 °C	0.1 °C
	Accuracy (@25°C/77°F)	±0.5 °C	±0.5 °C
	Temperature Compensation	automatic, 0 to 50 °C	
		Battery Type / Life	CR2032 3V Li-ion / approximately 1000 hours of continuous use
		Auto-off	8 minutes, 60 minutes, or can be disabled
		Environment	0 to 50°C (32 to 122°F); RH 100% max
		Dimensions	160 x 40 x 17 mm (6.3 x 1.6 x 0.7")
		Weight	75 g (2.6 oz.)

### Ordering Information

**HI98107** (pHep) is supplied with CR2032 battery, electrode cleaning solution sachet, pH 4.01 buffer solution sachet, pH 7.01 buffer solution sachet (2), storage/protection sleeve, instruction manual and quality certificate.

**HI98108** (pHep+) is supplied with CR2032 battery, electrode cleaning solution sachet, pH 4.01 buffer solution sachet, pH 7.01 buffer solution sachet (2), storage/protection sleeve, instruction manual and quality certificate.

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pH solutions begin on page 2.136



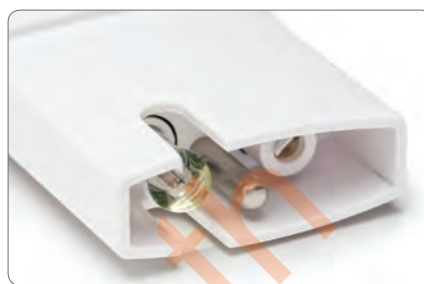
*GroLine*

HI98118

## GroLine pH Tester

- Waterproof
- Extractable clothjunction to extend pH electrode life
- Quick calibration mode using Hanna Quick Cal pH/EC calibration solution
- Two-button operation

The GroLine HI98118 pH/temperature tester is our latest pocket meter for measuring the pH of a hydroponic nutrient solution. The HI98118 has a very large easy to read LCD display that shows both pH and temperature along with calibration, stability, and low battery indicators. All operations are simplified to two buttons.



### Exposed temperature sensor

HI98118 features an exposed temperature sensor for faster response times.



### Watertight seal

An easily removable cover provides access to the battery compartment.



Supplied in a carrying case with buffer and cleaning solutions.

Specifications	HI98118
pH	Range 0.00 to 14.00 pH
	Resolution 0.01 pH
	Accuracy (@25°C/77°F) ±0.1 pH
	Calibration automatic, one or two-points (pH 4.01, 7.01, 10.01)
	Quick Calibration one-point calibration using HI5036 or HI50036P Quick Cal calibration solution
Temperature	Range 0.0 to 50.0°C/32.0 to 122.0°F
	Resolution 0.1°C/0.1°F
	Accuracy (@25°C/77°F) ±0.5°C/±1°F
Additional Specifications	Temperature Compensation automatic, 0 to 50°C (32 to 122°F)
	Battery Type / Life CR2032 3V Li-ion / approximately 1000 hours of continuous use
	Auto-off 8 minutes, 60 minutes, or can be disabled
	Environment 0 to 50°C (32 to 122°F); RH 100% max
	Dimensions 160 x 40 x 17 mm (6.3 x 1.6 x 0.7")
	Weight 75 g (2.6 oz.)
Ordering Information	<b>HI98118</b> GroLine pH tester, Quick Cal calibration sachets (3), electrode cleaning solution sachet, battery, instruction manual and quality certificate.



HI98100 · HI98103

## Checker® pH Testers

The latest Checker and Checker Plus are the next generation of the original Hanna Checker pH tester. The Checker is by far one of the most popular pH meters in the world with over 1 million meters used since its introduction in 1991. From students to researchers, the Checker has been helping people with their pH measurements as a meter that is simple to use and operate.

These Checker pH testers have been designed with many advanced features while maintaining the look and feel of the original Checker. The HI98100 Checker Plus and HI98103 Checker now offer automatic calibration to one or two points, automatic buffer recognition, calibrated buffer tags, stability indicator, low battery indicator, and selectable automatic shut off. Both the Checker and Checker Plus maintain the iconic pentagon design with a probe measuring 103 mm in length that is tapered to an 8 mm diameter, making it ideal for measurements in test tubes and vials.

Over 1 million users  
since its introduction



### Replaceable pH Electrode

The supplied HI1271 pH electrode is 103 mm long and tapers to an 8 mm diameter at the sensing end to easily fit into test tubes, vials, and other containers with small a opening.

### Economical

The Checker and Checker Plus are full-featured pH testers at an affordable price.

### High accuracy

The HI98100 Checker Plus features  $\pm 0.2$  pH accuracy with 0.01 resolution while the HI98103 features 0.1 resolution.

### Large LCD

Enhanced LCD that displays reading, stability indicator, low battery indicator, and calibration tags.

### Automatic Calibration

These meters are calibrated automatically to one or two points. The calibration buffers are automatically recognized and after calibration the buffer values used are shown on the display as a tag.

### Stability Indicator

An hourglass indicator is displayed on the LCD until a stable reading is obtained. Once a reading stabilizes, the indicator disappears and a reading can be recorded.

### Automatic Shut-off

These meters can be set to automatically turn off after 8 minutes or 60 minutes to conserve battery life in the event that the meter is left on. The auto-off feature can also be disabled.

### Long Battery Life

These Checkers have a long battery life of approximately 1000 hours. When the battery power is running low a battery indicator is displayed.

### Plastic Carrying Case

The HI98100 and HI98103 is supplied complete with meter, probe, calibration solutions, and cleaning solutions packaged in a durable plastic carrying case.



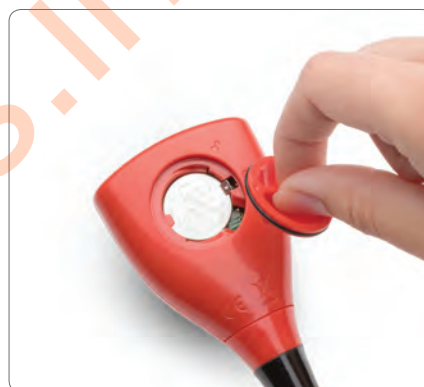




The HI1271 pH electrode can be easily replaced. Just unscrew the electrode from the meter body and screw on a new one.



Calibration can be performed directly in our solution sachets.



An easily removable cover provides access to the replaceable battery.

Specifications		HI98100 Checker Plus	HI98103 Checker
pH	Range	0.00 to 14.00 pH	0.0 to 14.0 pH
	Resolution	0.01 pH	0.1 pH
	Accuracy (@25°C/77°F)	±0.2 pH	
	Calibration	automatic, one or two-point	
Additional Specifications	Electrode	HI1271 (included)	
	Battery Type / Life	CR2032 Li-ion / approximately 1000 hours of continuous use	
	Auto-off	8 minutes, 60 minutes, or can be disabled	
	Environment	0 to 50°C (32 to 122°F); RH 95% max	
	Dimensions	50 x 174 x 21 mm (2 x 6.8 x 0.9")	
	Weight	50 g (1.8 oz)	
Ordering Information	<b>HI98100</b> and <b>HI98103</b> are supplied with HI1271 pH electrode, pH 4.01 buffer solution sachet (2), pH 7.01 buffer solution sachet (2), electrode cleaning solution sachet (2), battery, quality certificate, and instruction manual in a carrying case.		



Supplied in a carrying case with buffer and cleaning solutions.

HI98115

## GroLine pH Tester

The HI98115 GroLine pH tester has been designed with many advanced features for growers of all types. This pH tester offers automatic calibration to one or two points, automatic buffer recognition, calibrated buffer tags, stability indicator, low battery indicator, and selectable automatic shut-off. With its compact size, one-button operation, and ease of calibration, the HI98115 is the optimal tool for pH measurement in nutrient solutions and soil slurries.

*GroLine*



### Replaceable pH Electrode

The HI1271 supplied gel filled pH electrode is 103 mm long and tapers to an 8 mm diameter at the sensing end. This narrow electrode easily fits into test tubes, vials, and other containers with small opening.

### Economical

The HI98115 is a full-featured pH tester at a price that anyone that needs to measure pH can afford.

### High accuracy

The HI98115 GroLine pH tester features  $\pm 0.2$  pH accuracy with 0.01 resolution.

### Large LCD

Enhanced LCD that displays reading, stability indicator, low battery indicator and calibration tags.

### Automatic Calibration

HI98115 is calibrated automatically to one or two points. The calibration buffers are automatically recognized and after calibration the buffer values used are shown on the display as a tag.

### Stability Indicator

An hourglass indicator is displayed on the LCD until a stable reading is obtained. Once a reading stabilized the indicator disappears and a reading can be recorded.

### Automatic Shut-Off

The meter can be set to automatically turn off after 8 minutes or 60 minutes to conserve battery life in the event that the meter is left on. The auto off feature can be disabled.

### Long Battery Life

HI98115 has an exceptional long battery life of approximately 1000 hours. When the battery power is running low a low battery indicator is displayed.

### Plastic Carrying Case

HI98115 is supplied complete with meter, probe, calibration solutions and cleaning solutions packaged in a durable plastic carrying case.



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The HI1271 pH electrode can be easily replaced. Just unscrew the electrode from the meter body and screw on a new one.



An easily removable cover provides access to the replaceable battery.



pH calibration can be performed directly in our solution sachets.



### Plastic Carrying Case

HI98115 is supplied complete with meter, probe, calibration solutions and cleaning solutions packaged in a durable plastic carrying case

### Specifications

### HI98115

pH	Range	0.00 to 14.00 pH
	Resolution	0.01 pH
	Accuracy (@25°C/77°F)	±0.2 pH
	Calibration	automatic, one or two-point
	Electrode	HI1271 (included)
	Battery Type / Life	CR2032 Li-ion / approximately 1000 hours of continuous use
	Auto-off	8 minutes, 60 minutes, or can be disabled
	Environment	0 to 50°C (32 to 122°F); RH 95% max
	Dimensions	50 x 174 x 21 mm (2 x 6.8 x 0.9")
	Weight	50 g (1.8 oz)
Ordering Information	<b>HI98115</b> is supplied with HI1271 pH electrode, pH 4.01 buffer solution sachet (2), pH 7.01 buffer solution sachet (2), electrode cleaning solution sachet (2), battery, quality certificate, and instruction manual in a carrying case.	



HI98120 · HI98121

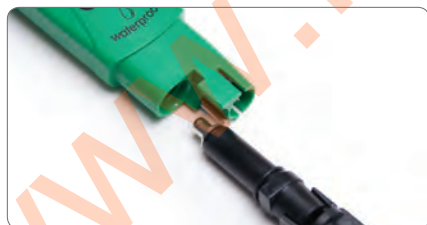
# pH/ORP and ORP Testers

- Automatic one or two-point pH calibration (HI98121)
- Waterproof
  - Waterproof and designed to float
- ATC
  - Automatic Temperature Compensation (HI98121)
- HOLD feature
  - HOLD button to freeze readings on the display
- Battery indicator
  - Battery life indicator at startup

The HI98120 is a waterproof ORP and temperature meter, while the HI98121 measures pH, ORP and temperature. The housing of these testers has been completely sealed against humidity and is designed to float.

Electrode replacement with the stainless steel round connector means there are no pins to bend or break during replacement.

When the cloth junction becomes clogged and response time is sluggish, simply pull out 3 mm (1/8") to clear the clogging which will improve response time and stability.



Replaceable pH (HI98121) or ORP (HI98120) electrode cartridge



Exposed temperature sensor

The exposed stainless steel temperature sensor facilitates faster and more accurate temperature measurement.



HI98121

HI98120

## Specifications

		HI98120	HI98121
pH	Range	–	-2.00 to 16.00 pH
	Resolution	–	0.01 pH
	Accuracy	–	±0.05 pH
ORP	Range	± 1000 mV	± 1000 mV
	Resolution	1 mV	1 mV
	Accuracy	±2 mV	±2 mV
Temperature	Range	-5.0 to 60.0°C / 23.0 to 140.0°F	-5.0 to 60.0°C / 23.0 to 140.0°F
	Resolution	0.1°C / 0.1°F	0.1°C / 0.1°F
	Accuracy	±0.5°C / ±1°F	±0.5°C / ±1°F
Additional Specifications	ORP Calibration	factory calibrated	factory calibrated
	pH Calibration	–	automatic, one or two-point with two sets of standard buffers (pH 4.01 / 7.01 / 10.01 or 4.01 / 6.86 / 9.18)
	Temperature Compensation	–	automatic for pH readings
	Electrodes	HI73120 replaceable ORP electrode (included)	HI73127 replaceable pH electrode (included); fixed ORP sensor
	Battery Type / Life	1.5V (4) / approximately 250 hours of continuous use; auto-off after 8 minutes of non-use	
	Environment	-5 to 50°C (23 to 122°F); RH max 100%	
	Dimensions / Weight	163 x 40 x 26 mm (6.4 x 1.6 x 1.0") / 100 g (3.5 oz.)	
		HI98120 (ORP) is supplied with HI73120 ORP electrode, HI73128 electrode removal tool, batteries and instructions.	

## Ordering Information

HI98121 (ORP/pH) is supplied with HI73127 pH electrode, HI73128 electrode removal tool, batteries and instructions.

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pH and ORP solutions begin on page 2.136; see pH and ORP electrode specifications on page 1.47





HI98201

## ORP Tester

- Extractable junction
- 700-Hour battery life

The HI98201 is an ORP tester ideal for use in swimming pools and spas, as it can provide a valuable indication of water quality. This tester utilizes a platinum electrode and Hanna unique renewable cloth junction, that can be pulled out when clogging occurs, reactivating the reference and restoring the electrode.

Oxidation reduction is a process by which a molecule or ion loses or gains electrons. This occurs most readily in water treatment and in pool and spa maintenance where an oxidizer, such as chlorine, is added to the water to destroy contaminants. The higher the ORP value, the greater the sanitizing power of your water.

### Specifications

HI98201

ORP	Range	±999 mV
	Resolution	1 mV
	Accuracy (@25°C/77°F)	±5 mV
Additional Specifications	Battery Type / Life	1.5V (4) / approximately 700 hours of continuous use
	Environment	0 to 50°C (32 to 122°F); RH max 95%
	Dimensions	175 x 41 x 23 mm (6.9 x 1.6 x 0.9")
	Weight	95 g (3.4 oz.)
<b>Ordering Information</b>		<b>HI98201</b> (ORP) is supplied with protective cap, batteries and instructions

ORP solutions begin on page 2.141

HI98203 SALINTEST

## Salt Content Meter

- Sodium ISE for NaCl readings
- Extractable junction

Worldwide, fish farming has made great strides in the past two decades, with aquaculture becoming the prime source for quality seafood. As the methods and products keep changing, one crucial factor remains the same: the necessity for salinity testing. The main component of salt in seawater is sodium chloride.

The SALINTEST can help you accurately monitor the concentration of sodium chloride in aquaculture systems. Besides applications in aquaculture, SALINTEST is also ideal for checking salt concentrations in live fish storage tanks, tropical fish aquariums, refrigerated storage and oceanographic investigations. The SALINTEST is easy to maintain and to assure accuracy, it has one-point calibration through a trimmer on the side.

### Specifications

HI98203 (SALINTEST)

NaCl	Range	0.00 to 1.00 pNaCl (58.4 to 5.84 g/L (ppt) NaCl)
	Resolution	0.01 pNaCl
	Accuracy (@25°C/77°F)	±0.02 pNaCl
Additional Specifications	Calibration	manual, one-point
	Battery Type / Life	1.5V (4) / approximately 500 hours of continuous use
	Environment	0 to 50°C (32 to 122°F); RH max 95%
	Dimensions	175 x 41 x 23 mm (6.9 x 1.6 x 0.9")
	Weight	95 g (3.4 oz.)
<b>Ordering Information</b>		<b>HI98203</b> (SALINTEST) is supplied with protective cap, calibration screwdriver, batteries and instructions. SALINTEST is also supplied with a handy chart that converts readings into g/L of sodium chloride.



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HI98311 · HI98312

# EC/TDS and Temperature Testers

- **Waterproof**
  - Waterproof and designed to float
- **ATC**
  - Automatic Temperature Compensation
- **HOLD feature**
  - HOLD button to freeze readings on the display
- **BEPS**
  - Alerts the user of low battery power that could adversely affect readings

When the original DiST® (Dissolved Solids Tester) was first introduced, conductivity (EC) and total dissolved solids (TDS) measurements became easy and affordable. The DiST's ease of use, in combination with its affordability, made it the standard in EC and TDS measurement. Hanna continues the standard in EC and TDS testing with the DiST®5 and DiST®6.

These testers include features such as: a replaceable graphite electrode, adjustable TDS ratio, °C or °F measurement, Automatic Temperature Compensation (ATC) with adjustable  $\beta$ , battery level indicator, stability indicator, automatic shut-off and automatic calibration.

The graphite conductivity electrode offers greater accuracy by resisting contamination by salt deposits in the sample.

All of these features are packed in a floating, waterproof casing. These 3-in-1 testers are unmatched in EC/TDS and temperature measurements.



## Replaceable graphite electrode

An easy-to-replace graphite electrode with a sturdy, snap-in connector means there are no pins to bend or break.



### Specifications

		HI98311 (DiST®5)	HI98312 (DiST®6)
EC	Range	0 to 3999 $\mu\text{S}/\text{cm}$	0.00 to 20.00 $\text{mS}/\text{cm}$
	Resolution	1 $\mu\text{S}/\text{cm}$	0.01 $\text{mS}/\text{cm}$
	Accuracy	$\pm 2\%$ F.S.	$\pm 2\%$ F.S.
TDS	Range	0 to 2000 $\text{mg}/\text{L}$ (ppm)	0.00 to 10.00 $\text{g}/\text{L}$ (ppt)
	Resolution	1 $\text{mg}/\text{L}$ (ppm)	0.01 $\text{g}/\text{L}$ (ppt)
	Accuracy	$\pm 2\%$ F.S.	$\pm 2\%$ F.S.
Temperature	Range	0.0 to 60.0°C / 32.0 to 140.0°F	0.0 to 60.0°C / 32.0 to 140.0°F
	Resolution	0.1°C / 0.1°F	0.1°C / 0.1°F
	Accuracy	$\pm 0.5^\circ\text{C}$ / $\pm 1^\circ\text{F}$	$\pm 0.5^\circ\text{C}$ / $\pm 1^\circ\text{F}$
Additional Specifications	Calibration	automatic, one point at 1413 $\mu\text{S}/\text{cm}$ or 1382 $\text{mg}/\text{L}$ (ppm)	automatic, one point at 12.88 $\text{mS}/\text{cm}$ or 6.44 $\text{g}/\text{L}$ (ppt)
	TDS Conversion Factor	adjustable from 0.45 to 1.00	
	Temperature Compensation	automatic, with $\beta$ adjustable from 0.0 to 2.4% / °C	
	Probe	HI73311 replaceable EC/TDS graphite electrode (included)	
	Environment	0 to 50°C (32 to 122°F); RH max 100%	
	Battery Type / Life	1.5V (4) / approx. 100 hours of continuous use; auto-off after 8 minutes of non-use	
	Dimensions	163 x 40 x 26 mm (6.4 x 1.6 x 1.0")	
	Weight	100 g (3.5 oz.)	
Ordering Information		<b>HI98311</b> (DiST®5) and <b>HI98312</b> (DiST®6) are supplied with HI73311 EC/TDS probe, HI73128 probe removal tool, batteries and instructions.	

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EC and TDS solutions begin on page 5.34; see EC electrode specifications on page 1.47

## GroLine

114 mm (4.5") stainless steel penetration probe



HI98331 Soil Test™

## GroLine Soil Test

Direct Soil EC and Temperature Meter with Built-in Stainless Steel EC Probe

- One-point calibration
- Automatic calibration to 1413  $\mu\text{S}/\text{cm}$  conductivity standard
- Automatic Temperature Compensation (ATC)
- Samples automatically compensated for temperature variations
- Uses a fixed 2%/°C temperature correction coefficient
- Stainless steel penetration electrode
- Allows for direct measurement in soil

The Soil Test™ Direct Soil EC Tester is a rugged and reliable pocket-sized tester that offers quick and accurate readings. The Soil Test™ features a stainless steel penetration probe for direct measurement of conductivity in soils. With a compact size, single button operation, and automatic calibration, Soil Test is an excellent choice for taking direct conductivity measurements in soil.



### Battery compartment

An easily removable cover provides access to the battery compartment.



Supplied in a carrying case with probe sleeve

### Specifications

#### HI98331 Soil Test™

EC	Range	0 to 4000 $\mu\text{S}/\text{cm}$ 0.00 to 4.00 $\text{mS}/\text{cm}$ (dS/m)
	Resolution	1 $\mu\text{S}/\text{cm}$ 0.01 $\text{mS}/\text{cm}$ (dS/m)
	Accuracy (@25°C/77°F)	$\pm 50 \mu\text{S}/\text{cm}$ (0 to 2000 $\mu\text{S}/\text{cm}$ ) $\pm 300 \mu\text{S}/\text{cm}$ (2000 to 4000 $\mu\text{S}/\text{cm}$ ) $\pm 0.05 \text{ mS}/\text{cm}$ (0.00 to 2.00 $\text{mS}/\text{cm}$ ) $\pm 0.30 \text{ mS}/\text{cm}$ (2.00 to 4.00 $\text{mS}/\text{cm}$ )
	Calibration	automatic, one-point (1.41 $\text{mS}/\text{cm}$ )
Temperature	Range	0.0 to 50.0°C (32.0 to 122.0°F)
	Resolution	0.1°C (0.1°F)
	Accuracy (@25°C/77°F)	$\pm 1^\circ\text{C}$ ( $\pm 1.5^\circ\text{F}$ )
Additional Specifications	Temperature Compensation	Automatic, with coefficient ( $\beta$ ) fixed @ 2%/°C
	Probe	114 mm (4.5") stainless steel penetration (fixed)
	Battery Type / Life	CR2032 Li-ion (included) / approx. 100 hours of continuous use
	Auto-off	8 minutes, 60 minutes, or can be disabled
	Environment	0 to 50°C (32 to 122°F); RH 95% max
	Dimensions	50 x 196 x 21 mm (2.0 x 7.7 x 0.9")
	Weight	74 g (2.4 oz.)
Ordering Information	<b>HI98331</b> (Soil Test) is supplied with HI73331 penetration conductivity probe, calibration screwdriver, batteries and instructions.	

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DiST®: HI98301 · HI98302 · HI98303  
HI98304

## EC and TDS Testers

- Waterproof
- Automatic temperature compensation (ATC)
- Automatic one-point calibration
- Measurement stability indicator
- Temperature measurement

The DiST® family of testers is widely used for monitoring EC/TDS in drinking water, water conditioning, reverse osmosis, cooling towers, wastewater, laboratories, agriculture, aquaculture and aquariums, hydroponics and the printing industry.

These testers feature an amperometric graphite electrode that provides improved repeatability in measurements, since they do not oxidize. An amperometric measurement of EC/TDS is based on Ohm's Law,  $I = V/R$ , where R depends on the distance between two pins and their surface. Oxidation changes both the distance and surface, which will directly affect accuracy. DiST® non-oxidizing graphite pins are able to provide an optimal surface for accurate, dependable results.

When calibration is needed, simply submerge the electrode tip into calibration solution and the meter will auto calibrate.



### Exposed temperature sensor

These testers feature exposed temperature sensors for faster response times.



### Watertight seal

An easily removable cover provides access to the battery compartment.



Specifications		HI98301 (DiST®1)	HI98302 (DiST®2)	HI98303 (DiST®3)	HI98304 (DiST®4)
TDS	Range	0 to 2000 mg/L (ppm)	0.00 to 10.00 g/L (ppt)	–	–
	Resolution	1 mg/L (ppm)	0.01 g/L (ppt)	–	–
	Accuracy (@25°C/77°F)	±2% F.S.	–	–	–
	TDS Factor	0.5	0.5	–	–
EC	Range	–	–	0 to 2000 µS/cm	0.00 to 20.00 mS/cm
	Resolution	–	–	1 µS/cm	0.01 mS/cm
	Accuracy (@25°C/77°F)	–	–	±2% F.S.	–
Temperature	Range	0.0 to 50.0°C/32.0 to 122.0°F			
	Resolution	0.1°C / 0.1°F			
	Accuracy (@25°C/77°F)	±0.5°C / ±1.0°F			
Additional Specifications	Calibration Solution	HI70032: 1382 ppm	HI70038: 6.44 ppt	HI70031: 1413 µS/cm	HI70030: 12.88 mS/cm
	Calibration	automatic, one-point			
	Temperature Compensation	automatic from 0 to 50°C (32 to 122°F)			
	Battery Type / Life	CR2032 3V Li-ion / approx. 250 hours of continuous use			
	Environment	0 to 50°C (32 to 122°F); RH 100% max			
	Dimensions	160 x 40 x 17 mm (6.3 x 1.6 x 0.7")			
	Weight	75 g (2.6 oz.)			
	Ordering Information	<p><b>HI98301</b> (DiST 1) is supplied with CR2032 battery, 1382 ppm calibration solution sachet (4), storage/protection sleeve, instruction manual and quality certificate.</p> <p><b>HI98302</b> (DiST 2) is supplied with CR2032 battery, 6.44 ppt calibration solution sachet (4), storage/protection sleeve, instruction manual and quality certificate.</p> <p><b>HI98303</b> (DiST 3) is supplied with CR2032 battery, 1413 µS/cm calibration solution sachet (4), storage/protection sleeve, instruction manual and quality certificate.</p> <p><b>HI98304</b> (DiST 4) is supplied with CR2032 battery, 12.88 mS/cm calibration solution sachet (4), storage/protection sleeve, instruction manual and quality certificate.</p>			

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EC and TDS solutions begin on page 5.34





*GroLine*

HI98318

## GroLine EC/TDS Tester

- Waterproof
- Automatic temperature compensation (ATC)
- Automatic one-point EC calibration
- Measurement stability indicator

The GroLine waterproof EC/TDS tester is ideal for hydroponics, greenhouses, or anywhere you need quick and accurate conductivity measurements.



### Exposed temperature sensor

HI98318 features an exposed temperature sensor for faster response times.



### Watertight seal

An easily removable cover provides access to the battery compartment.



Supplied in a carrying case with calibration solutions.

### Specifications

HI98318

EC/TDS	Range	0.00 to 6.00 mS/cm; 0 to 3000 ppm (0.5); 0 to 4000 ppm (0.7)
	Resolution	0.01 mS/cm; 10 ppm (0.5); 10 ppm (0.7)
	Accuracy (@25°C/77°F)	±2% F.S.
	Calibration	automatic, one-point (1.41 mS)
	Quick Calibration	one-point calibration using HI5036 or HI50036P Quick Cal calibration solution
	TDS Conversion Factor (CF)*	0.5 (500 ppm) or 0.7 (700 ppm)
Temperature	Range	0.0 to 50.0°C/32.0 to 122.0°F
	Resolution	0.1°C/0.1°F
	Accuracy (@25°C/77°F)	±0.5°C/±1°F
Additional Specifications	Temperature Compensation	automatic, 0.0 to 50.0°C (32 to 122°F)
	Battery Type / Life	CR2032 Li-ion (Included) / approx. 250 hours of continuous use
	Auto-off	8 minutes, 60 minutes, or can be disabled
	Environment	0 to 50°C (32 to 122°F); RH 100% max
	Dimensions	160 x 40 x 17 mm (6.3 x 1.6 x 0.7")
	Weight	75 g (2.6 oz.)
Ordering Information	<b>HI98318</b> GroLine EC/TDS tester is supplied with Quick Cal calibration sachets (4), battery, storage cap, instruction manual and quality certificate.	

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Primo

## EC/TDS Testers

- Single point automatic calibration
- Automatic temperature compensation (ATC)

The Primo series of testers provide a fast and dependable way to measure the total dissolved solids or conductivity in your water samples. It is ideally suited for the rigorous demands of water quality professionals. These meters feature Automatic Temperature Compensation (ATC) and automatic single point calibration.

Primo TDS tester is a rugged and reliable pocket-sized tester that offers quick and accurate readings. Primo is used for testing total dissolved solids (TDS) in applications such as hydroponics, drinking water, reverse osmosis systems, and aquariums.

Primo 5 EC tester is a rugged and reliable pocket-sized tester that offers quick and accurate readings. Primo 5 is used for testing low range conductivity (EC) in applications such as hydroponics, drinking water, reverse osmosis systems, boilers and cooling towers, and aquariums.

Primo 4 EC tester is a rugged and reliable pocket-sized tester with a 3 m (3.3') cable probe connection that offers quick and accurate conductivity reading (EC) in the 0.00 to 10.00 mS/cm range. Perfect for applications such as hydroponics, drinking water and aquariums.



Specifications		Primo	Primo 5	Primo 4
TDS	Range	0 to 1999 mg/L (ppm)	–	–
	Resolution	1 mg/L (ppm)	–	–
	Accuracy (@25°C/77°F)	±2% F.S.	–	–
EC	Range	–	0 to 1999 µS/cm	0.00 to 10.00 mS/cm
	Resolution	–	1 µS/cm	0.01 mS/cm
	Accuracy (@25°C/77°F)	–	±2% F.S.	±2% F.S.
Additional Specifications	Calibration	automatic, at 1382 mg/L (ppm)	automatic, at 1413 µS/cm	automatic, at 5.00 mS/cm
	Probe Connection	direct	direct	1 m (3.3') cable
	Dimensions	180 x 50 x 25 mm (7.1 x 2.0 x 1.0")	180 x 50 x 25 mm (7.1 x 2.0 x 1.0")	66 x 50 x 25 mm (2.6 x 2.0 x 1.0")
	Weight	50 g (1.8 oz.)	50 g (1.8 oz.)	115 g (4.1 oz.)
	Temperature Compensation	automatic from 0 to 60°C (32 to 140°F), β=2%/°C		
	Battery Type / Life	1.5V (2) / approximately 200 hours of continuous use; auto-off after 5 minutes of non-use		
	Environment	0 to 50°C (32 to 122°F); RH max 95%		
Ordering Information	Primo and Primo 5 are supplied with batteries and instructions. Primo 4 with 1 m (3.3') cable probe connection are supplied with batteries and instructions.			

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HI98308 · HI98309

## Water Purity Testers

The HI98308 and HI98309 use a conductometric measurement to determine the purity of water.

The HI98308 Pure Water Test (PWT) enables users to check the purity of distilled or demineralized water in laboratory or industrial environments.

The HI98309 Ultra Pure Water (UPW) is an ideal tester for high purity water, which has less conductivity.

PWT is suited for fields such as printed circuit board washing, laundry, steam cleaning, checking car battery water and all areas where distilled, demineralized or pure water is used.

UPW is the first pure water tester to measure in 1/1000ths of micro-Siemens ( $\mu\text{S}$ ) and provides fast spot checks for minute traces of water contamination.

These testers are housed in durable casing that provides excellent protection against harsh industrial environments.



Specifications		HI98308 (PWT)	HI98309 (UPW)
EC	Range	0.0 to 99.9 $\mu\text{S}/\text{cm}$	0.000 to 1.999 $\mu\text{S}/\text{cm}$
	Resolution	0.1 $\mu\text{S}/\text{cm}$	0.001 $\mu\text{S}/\text{cm}$
	Accuracy	$\pm 2\%$ F.S.	$\pm 2\%$ F.S.
Additional Specifications	Calibration	manual, one point	factory calibrated
	Temperature Compensation	automatic from 0 to 50°C (32 to 122°F) with $\beta=2\%/^{\circ}\text{C}$ typical	–
	Battery Type / Life	1.5V (4) / approximately 250 hours of continuous use	1.5V (4) / approximately 120 hours of continuous use
	Environment	0 to 50°C (32 to 122°F); RH max 95% non condensing	
	Dimensions	175 x 41 x 23 mm (6.9 x 1.6 x 0.9")	
	Weight	95 g (3.4 oz.)	
Ordering Information		HI98308 (PWT) and HI98309 (UPW) are supplied with protective cap, calibration screwdriver (HI98308 only), batteries and instructions.	

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CODE	HI73127	HI73120	HI73311	HI1270	HI1271
Description	pH electrode	ORP electrode	EC/TDS electrode	pH electrode	pH electrode
Reference	single, Ag/AgCl	single, Ag/AgCl		single, Ag/AgCl	single, Ag/AgCl
Junction / Flow Rate	cloth	cloth		open	open
Electrolyte	gel	gel		viscolene	viscolene
Max Pressure	0.1 bar	0.1 bar		0.1 bar	0.1 bar
Range	pH: 0 to 14	ORP: $\pm 2000$ mV		pH: 0 to 13	pH: 0 to 13
Recommended Operating Temp.	-5 to 50°C (23 to 122°F) - GP	-5 to 50°C (23 to 122°F) - GP	-5 to 50°C (23 to 122°F) - GP	0 to 50°C (32 to 122°F) - GP	0 to 50°C (32 to 122°F) - GP
Tip / Shape	spheric (dia: 5.0 mm)	platinum pin		spheric (dia: 3.0 mm)	spheric (dia: 3.0 mm)
Temperature Sensor	no	no	no	no	no
Amplifier	no	no	no	no	no
Body Material	polypropylene	polypropylene	polypropylene	polypropylene	polypropylene
Cable	no	no	no	no	no
Recommended Use	general purpose, field applications	general purpose, field applications	general purpose, field applications	general purpose, field applications	general purpose, field applications
Connection	pin	pin	pin	screw cap	screw cap

# 1 Replacement Electrodes



CODE	HI1280	HI1290	HI1295	HI1286	HI1293D
Description	pH electrode	pH electrode	pH electrode	pH electrode	pH electrode
Reference	single, Ag/AgCl	single, Ag/AgCl	single, Ag/AgCl	double, Ag/AgCl	double, Ag/AgCl
Junction / Flow Rate	ceramic, single / 15-20 µL/H	ceramic, single / 15-20 µL/H	ceramic, single / 15-20 µL/H	PTFE	PTFE
Electrolyte	gel	gel	gel	polymer	polymer
Max Pressure	0.1 bar	0.1 bar	2 bar	3 bar	3 bar
Range	pH: 0 to 13	pH: 0 to 13	pH: 0 to 13	pH: 0 to 13	pH: 0 to 13
Recommended Operating Temp.	0 to 70°C (32 to 158°F) - GP	0 to 70°C (32 to 158°F) - GP	0 to 70°C (32 to 158°F) - GP	0 to 80°C (32 to 176°F) - GP	0 to 60°C (32 to 140°F)
Tip /Shape	spheric (dia: 5.0 mm)	spheric (dia: 5.0 mm)	spheric (dia: 5.0 mm)	spheric (dia: 7.5 mm)	spheric (dia: 7.5 mm)
Temperature Sensor	yes	yes	yes	no	no
Amplifier	yes	yes	yes	no	yes
Body Material	polypropylene	polypropylene	polypropylene	PEI	PEI
Cable	no	no	no	coaxial; 2 m (6.6')	5-pole; 2 m (6.6')
Recommended Use	general purpose, field applications	general purpose, field applications	general purpose, field applications	general purpose, water treatment, agriculture	hydroponics, greenhouses
Connection	multi-pin	multi-pin	multi-pin	BNC	DIN

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