

Broschüre für die Landwirtschaft



Introduction



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 with 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.



GroLine

HI98118

GroLine pH Tester

- Waterproof
- Extractable cloth junction 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)	±0.10 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/±1.0°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	HI98118 GroLine pH tester, Quick Cal calibration sachets (3), electrode cleaning solution sachet, battery, instruction manual and quality certificate.	

GroLine

HI98115

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.

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 ± 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.



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

Plastic Carrying Case

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
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	HI98115 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.	

GroLine

HI98331 Soil Test™

Soil Test

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

- One-point calibration
- Automatic calibration to 1413 $\mu\text{S/cm}$ 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.



114 mm (4.5") stainless steel penetration probe

max immersion level

recommended immersion level



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 $\mu\text{S/cm}$ 0.00 to 4.00 mS/cm (dS/m)
	Resolution	1 $\mu\text{S/cm}$ 0.01 mS/cm (dS/m)
	Accuracy (@25°C/77°F)	$\pm 50 \mu\text{S/cm}$ (0 to 2000 $\mu\text{S/cm}$) $\pm 300 \mu\text{S/cm}$ (2000 to 4000 $\mu\text{S/cm}$) $\pm 0.05 \text{ mS/cm}$ (0.00 to 2.00 mS/cm) $\pm 0.30 \text{ mS/cm}$ (2.00 to 4.00 mS/cm)
	Calibration	automatic, one-point (1.41 mS/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 (β) 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	HI98331 (Soil Test) is supplied with HI73331 penetration conductivity probe, calibration screwdriver, batteries and instructions.	

GroLine

HI981030

Soil pH Tester

with specialized probe

The HI981030 GroLine soil pH tester is an application specific designed pH tester for the measurement of soil pH. This meter offers many advanced features including the ability to clear any clogging of the reference junction, which results in a longer life than standard pH testers.

- **pH Electrode with replaceable bridge electrolyte**
 - The pH electrode has an outer junction sleeve that can be removed and cleaned. Once cleaned a small amount of supplied gel electrolyte is added and the junction is refreshed improving the pH measurement and extending the life of the meter.
- **Conical tip**
 - Allows for easy penetration into wetted soil. If stones are present or the soil is hardened then it is best to use an auger to make a hole for the pH electrode to be inserted into. If the soil is dry the use of purified water can be used to wet the soil.
- **PVDF body**
 - Polyvinylidene Fluoride (PVDF) is a food grade plastic that is resistant to most chemicals and solvents, including sodium hypochlorite that is used for disinfection. It has high abrasion resistance, mechanical strength, and resistance to ultraviolet. PVDF is also resistant to fungal growth.
- **Large LCD**
 - An enhanced LCD displays the measurement reading, stability indicator, low battery indicator, and calibration tags.
- **Automatic calibration**
 - The GroLine soil pH tester 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.
- **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 taken.
- **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 also be disabled.
- **Probe diagnostic**
 - During calibration the meter will display error (Err) message as an indicator that the probe needs to be cleaned.
- **Long battery life**
 - The GroLine soil pH tester has an exceptional battery life of approximately 1000 hours. When the battery power is running low, a low battery indicator is displayed.
- **Economical**
 - The GroLine soil pH tester is a fully featured meter at a price that is affordable for both the home gardener to professional grower.



Removable sleeve to extend probe life



Supplied complete

Supplied complete with meter, probe, calibration solutions, and cleaning solutions.

Specifications	HI981030
pH	Range 0.0 to 14.0 pH
	Resolution 0.1 pH
	Accuracy (@25°C/77°F) ±0.2 pH
	Calibration automatic, one or two-point
Additional Specifications	Battery Type / Life CR2032 Li-ion / approx. 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 51 x 151 x 21 mm (2 x 5.9 x 0.9")
	Weight 44 g (1.6 oz.)
Ordering Information	HI981030 is supplied with pH 4.01 buffer solution sachets (2), pH 7.01 buffer solution sachets (2), electrode cleaning solution sachets for deposits of soil (1) and humus (1), gelled bridge electrolyte, electrode storage solution, CR2032 3V Li-ion battery, quality certificate, and instruction manual.



GroLine

HI98318

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	HI98318 GroLine EC/TDS tester is supplied with Quick Cal calibration sachets (4), battery, storage cap, instruction manual and quality certificate.	

GroLine

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 (β).



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

GroLine

HI981421

GroLine Hydroponics Monitor

with inline multiparameter probe



24/7 Monitoring.

The HI981421 GroLine Monitor provides 24 hour continuous monitoring of pH, conductivity (EC or TDS), and temperature in hydroponic nutrients. Quick to setup and simple to use, this monitor was designed with Hydroponics, Aquaponics, and Greenhouses in mind. Make your nutrient solution easy to manage with the GroLine Monitor and combined pH/EC/Temperature probe.

Instantly See All Measurements.

The versatile display of the GroLine Monitor allows for three screen modes. The LCD can display all three essential hydroponic nutrients measurements at one time, a 3-second cycle of single measurements, or a real-time graph screen with options for measurement selection and log recall.

Monitor Changes Over Time.

Fluctuations in your hydroponic nutrient solution can have lasting effects on your plants. The GroLine Monitor automatically logs every 15 minutes for the last 30 days, and stores min, max, and average values so you can recognize when patterns arise and help prevent future problems. For review and storage, use the USB-C to easily transfer data to a flash drive or PC using a cable. Files are exported as .csv.

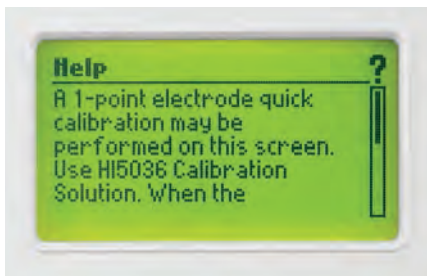
Grow With Confidence.

The GroLine Monitor frees up your time by doing the testing for you. Simply set high and low alarm levels - if your hydroponic nutrient solution moves out of range a measurement error will display. A quick look at the large display will let you know if your nutrient solution needs adjusting.

Features

- Can be integrated into a fertilizer system
- pH/EC inline probe with built-in temperature sensor
- IP65 rated enclosure designed to withstand harsh growing environments
- Selectable EC to TDS conversion factor: choice of either a 0.5 or 0.7 conversion factor
- Automatic Temperature Compensation
 - All readings are compensated for variations in temperature. Temperature displayed in °C or °F along with pH, EC or TDS reading
- Large LCD with plant-friendly green backlighting
- Ambient light sensor for automatic LCD dimming
- Quick calibration using Quick Cal solution simultaneously for pH and EC
- Calibration reminder
- Data logging for 30 days
 - Logs every 15 minutes for last 30 days, stores min, max, and average values
- Setup, Calibration and Operating parameters are stored in nonvolatile memory. All settings are retained if power is lost.
- 24 hour summary screens (plot and details)
- GLP feature calibration data for the pH and EC (up to 5 calibrations)
- Alarms feature for all parameters

On-Screen Features



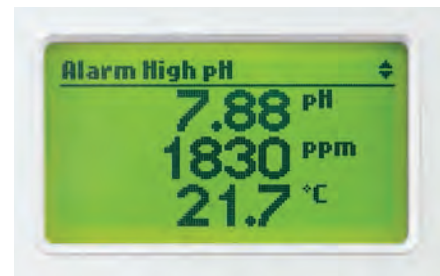
On-screen Help

Context sensitive help is available at the push of a button.



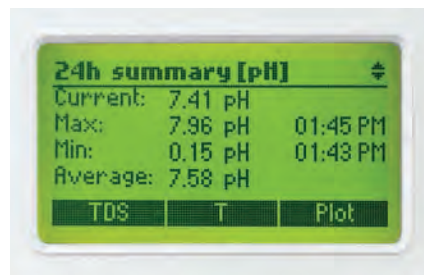
High and Low Alarms

High and Low alarms for pH, EC/TDS and Temperature. Warns when process is out of desired range by flashing display and message



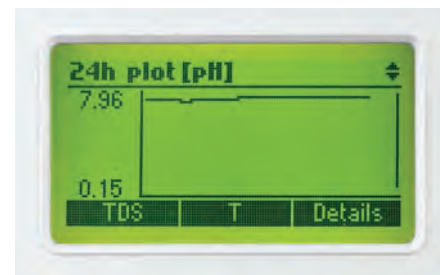
Menu

Easy to navigate menu system to access calibration, GLP, and meter setup.



Data Viewing

30 day and 24 hour summary screens can be viewed in plot or detail views. Real-time data can be viewed in plot view.



Data Transfer

Data transfer: USB-C port for easy data transfer to memory stick or PC



Calibration Timeout

Set a reminder to calibrate your probe. Reminder can be set from 1 to 30 days



GLP

The HI981421 can store calibration info from the last 5 pH and EC calibrations.



Quick Cal

Quick Cal is for use with Hanna's GroLine pH and/or EC/TDS meters. Using the Quick Cal function found in compatible meters allows for single-point calibration for pH and/or conductivity sensors.



Inline Probe

The supplied HI1285-9 multiparameter probe measures pH, EC and temperature in one convenient, rugged probe. A solid-state preamplifier is integrated into the probe to protect the pH measurement from transient electrical noise. Sources of electrical noise include ballasts used in lighting and pumps to circulate water and nutrient solutions. The HI1285-9 incorporates two graphite EC sensors for reliable conductivity readings.



Specifications

HI981421

pH	Range	0.00 to 12.00 pH, 0.0 to 12.0 pH
	Resolution	0.01 pH; 0.1 pH
	Accuracy	±0.05 pH, ±0.1pH
	Calibration	one or two-point calibration (using pH 4.01, 7.01, 10.01 buffers) using auto buffer recognition; one-point calibration using quick calibration solution
	Temperature Compensation	Automatic: 0.0 to 60.0 °C; 32.0 to 140.0 °F
EC	Range	0.00 to 10.00 mS/cm
	Resolution	0.01 mS/cm
	Accuracy	±0.1 mS/cm from 0.00 to 5.00 mS/cm; ±0.2 mS/cm from 5.00 to 10.00 mS/cm)
	Calibration	one-point at 1.41 mS/cm or 5.00 mS/cm using auto standard recognition; one-point calibration using quick calibration solution
	Temperature Compensation	automatic, with $\beta = 1.9\%/^{\circ}\text{C}$
TDS	Range	0 to 5000 ppm (0.5 TDS Factor*); 0 to 7000 ppm (0.7 TDS Factor*)
	Resolution	10 ppm (mg/L)
	Accuracy	±2%FS
	Calibration	through EC calibration
	Conversion Factor (CF)*	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
Probe	Description	HI1285-9 triple junction inline pH/EC/TDS temperature PVC body, pre-amplified multiparameter probe with internal temperature sensor, DIN connector, 3 m (9.8') cable
	Max Pressure	8 bar
	Range	0 to 12 pH
	Ingress protection	IP68 (continuous immersion up to 2 meters)
	Dimensions	187 x 25 x 25mm (7.36 x 0.98 x 0.98")
	Weight	191g (7.7oz.)
Additional Specifications	Automatic Logging	measurements (pH, EC, TDS, Temperature) min/max/average/status logged continuously at 15 minutes interval, recall graphic modes
	Data Export	export on USB-C flash drive or PC ; log files in CSV format
	Data Storage	30 days stored data at 15 minutes interval
	Display	128 x 64 pixel B/W LCD with green backlight, Automatic backlight dimming using ambient light sensor.
	GLP	Good Laboratory Practice with last 5 pH and EC calibration history.
	Monitor Waterproof Protection	IP65 (dust and low pressure water jets)
	Alarms	high and low with enable/disable option for all parameters.
	USB-C (Host/Device)	Export logged data on USB flash drive / PC
	Power Supply	12VDC adapter (included)
	Environment	0 to 50 °C (32 to 122 °F), RH max 95% non-condensing
	Dimensions	125 x 185 x 38 mm (4.92 x 7.28 x 1.49")
	Weight	333g (11.7oz.)
Ordering Information	HI981421-01 (115V) and HI981421-02 (230V) is supplied with HI1285-9 multiparameter probe, Quick Cal buffer solution sachets (2), HI700661 electrode cleaning solution sachets for agriculture (2), 12VDC power adapter, quality certificates and instruction manual.	

GroLine

HI981420

GroLine Hydroponics Monitor



24/7 Monitoring.

The HI981420 GroLine Monitor provides 24 hour continuous monitoring of pH, conductivity (EC or TDS), and temperature in hydroponic nutrients. Quick to setup and simple to use, this monitor was designed with Hydroponics, Aquaponics, and Greenhouses in mind. Make your nutrient solution easy to manage with the GroLine Monitor and combined pH/EC/Temperature probe.

Instantly See All Measurements.

The versatile display of the GroLine Monitor allows for three screen modes. The LCD can display all three essential hydroponic nutrients measurements at one time, a 3-second cycle of single measurements, or a real-time graph screen with options for measurement selection and log recall.

Monitor Changes Over Time.

Fluctuations in your hydroponic nutrient solution can have lasting effects on your plants. The GroLine Monitor automatically logs every 15 minutes for the last 30 days, and stores min, max, and average values so you can recognize when patterns arise and help prevent future problems. For review and storage, use the USB-C to easily transfer data to a flash drive or PC using a cable. Files are exported as .csv.

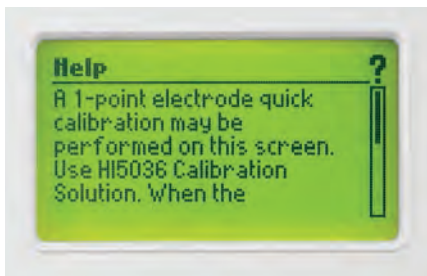
Grow With Confidence.

The GroLine Monitor frees up your time by doing the testing for you. Simply set high and low alarm levels - if your hydroponic nutrient solution moves out of range a measurement error will display. A quick look at the large display will let you know if your nutrient solution needs adjusting.

Features

- 3 sensors combined in a single rugged probe body
 - pH electrode with renewable cloth junction, amperometric EC/TDS sensor, and an internal temperature sensor for temperature compensated readings
- IP65 rated enclosure designed to withstand harsh growing environments
- Selectable EC to TDS conversion factor: choice of either a 0.5 or 0.7 conversion factor
- Automatic Temperature Compensation
 - All readings are compensated for variations in temperature. Temperature displayed in °C or °F along with pH, EC or TDS reading
- Large LCD with plant-friendly green backlighting
- Ambient light sensor for automatic LCD dimming
- Calibration reminder
- Data logging for 30 days
 - Logs every 15 minutes for last 30 days, stores min, max, and average values

On-Screen Features



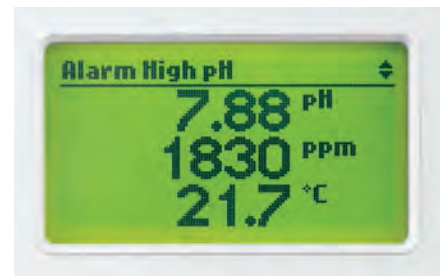
On-screen Help

Context sensitive help is available at the push of a button.



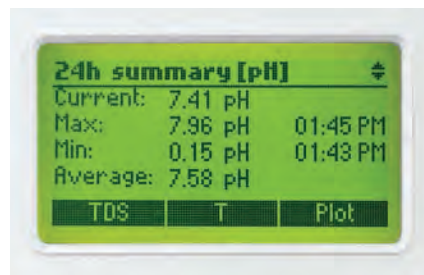
High and Low Alarms

High and Low alarms for pH, EC/TDS and Temperature. Warns when process is out of desired range by flashing display and message



Menu

Easy to navigate menu system to access calibration, GLP, and meter setup.



Data Viewing

30 day and 24 hour summary screens can be viewed in plot or detail views. Real-time data can be viewed in plot view.



Data Transfer

Data transfer: USB-C port for easy data transfer to memory stick or PC



Calibration Timeout

Set a reminder to calibrate your probe. Reminder can be set from 1 to 30 days



GLP

The HI981420 can store calibration info from the last 5 pH and EC calibrations.



Quick Cal

Quick Cal is for use with Hanna's GroLine pH and/or EC/TDS meters. Using the Quick Cal function found in compatible meters allows for single-point calibration for pH and/or conductivity sensors.



Simpler with a combination probe

The HI1285-8 is a 3-in-1 pre-amplified combination probe. This probe is built to be durable, with an extendable cloth pH junction and two graphite sensors for reliable conductivity readings. A built-in temperature sensor ensures fast, accurately compensated readings even during sudden temperature fluctuations.

Supplied Complete

HI981420 GroLine Monitor is supplied with all the tools necessary so you can start monitoring right away.



Specifications	HI981420	
pH	Range*	0.00 to 14.00 pH; 0.0 to 14.0 pH
	Resolution	0.01 pH; 0.1 pH
	Accuracy	±0.05 pH, ±0.1pH
	Calibration	one or two-point calibration (using pH 4.01, 7.01, 10.01 buffers) using auto buffer recognition; one-point calibration using quick calibration solution
	Temperature Compensation	automatic from 0.0 to 60.0°C (32.0 to 140.0°F)
EC	Range	0.00 to 10.00 mS/cm
	Resolution	0.01 mS/cm
	Accuracy	±0.1 mS/cm from 0.00 to 5.00 mS/cm; ±0.2 mS/cm from 5.00 to 10.00 mS/cm)
	Calibration	one-point at 1.41 mS/cm or 5.00 mS/cm using auto standard recognition; one-point calibration using quick calibration solution
	Temperature Compensation	automatic, with $\beta = 1.9\%/^{\circ}\text{C}$
TDS	Range	0 to 5000 ppm (0.5 TDS Factor)*; 0 to 7000 ppm (0.7 TDS Factor)*
	Resolution	10 ppm (mg/L)
	Accuracy	±2%FS
	Calibration	through EC calibration
	Conversion Factor (CF)	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
Probe	Description	HI1285-8 pH/EC/TDS/temperature polypropylene body, pre-amplified multiparameter probe with internal temperature sensor DIN connector and 2 m (6.6') cable
	Max Pressure	0.2 bar
	Range	0 to 13 pH
	Ingress protection	IP68 (continuous immersion up to 2 meters)
	Dimensions	187 x 25 x 25mm (7.36 x 0.98 x 0.98")
	Weight	191g (7.7oz.)
Additional Specifications	Automatic Logging	measurements (pH, EC, TDS, Temperature) min/max/average/status logged continuously at 15 minutes interval, recall graphic modes
	Data Export	export on USB-C flash drive or PC; log files in CSV format
	Data Storage	30 days stored data at 15 minutes interval
	Display	128 x 64 pixel B/W LCD with green backlight, Automatic backlight dimming using ambient light sensor.
	GLP	Good Laboratory Practice with last 5 pH and EC calibration history.
	Monitor Ingress Protection	IP65 (dust and low pressure water jets)
	Alarms	high and low with enable/disable option for all parameters.
	USB-C (Host/Device)	Export logged data on USB flash drive / PC
	Power Supply	12VDC adapter (included)
	Environment	0 to 50 °C (32 to 122 °F), RH max 95% non-condensing
	Dimensions	125 x 185 x 38 mm (4.92 x 7.28 x 1.49")
Weight	333g (11.7oz.)	
Ordering Information	HI981420-01 (115V) and HI981420-02 (230V) is supplied with HI1285-8 multiparameter probe, Quick Cal buffer solution sachets (2), HI700661 electrode cleaning solution sachets for agriculture (2), power adapter, quality certificates and instruction manual.	



HALO[®]

Wireless pH Meters

Take lab grade measurements
using a smart phone or tablet.

HALO is the world's first professional pH probe with Bluetooth[®] Smart technology (Bluetooth[®] 4.0). This technology is energy efficient, allowing for low power consumption to maximize the life of the replaceable battery used in the pH electrode. HALO pH probes can be used virtually anywhere: in the field, laboratory, or classroom. Their versatility and ease of use will revolutionize the way pH is measured.



One Press Connect

Connect to the Hanna Lab App at the press of a button via Bluetooth® wireless technology (10 m range (33')). Visible from a distance, the LED halo light indicates the probe is active and transmitting.



One Button Sample Tagging

Pressing the button on the HALO pH probe or the probe icon in the Hanna Lab App will tag sample data for easy reference.



Easy to Replace Battery

The HALO's CR2032 lithium ion battery is easily replaced and lasts for approximately 500 hours.

HI12922



Compatible with:
iOS
Android™
edge®/blu

Ideal for direct soil applications

The HI12922 HALO is an innovative, application specific pH electrode with Bluetooth® Smart technology that allows the use of a compatible Apple or Android smart device to be used as a pH meter. This electrode is designed for agricultural, hydroponics and greenhouse growers that need to monitor the pH of soil and soilless media in order to optimize plant growth.

- **Conic bulb**
 - Easy penetration into soft solids and semi-solids
- **Triple ceramic junction**
 - High flow rate for fast and stable response in slightly hydrated media
- **Refillable**
 - Allows the filling of the reference cell with electrolyte fill solution
- **Built-in temperature sensor**
 - High accuracy temperature compensated measurements

Conic Bulb

The conical shaped tip design allows for the easy penetration of the sensor into soft solids and semi-solids such as soil and soilless media. Soilless media includes hydroponics growing media including rockwool, coconut coir, and perlite.

Triple Ceramic Junction

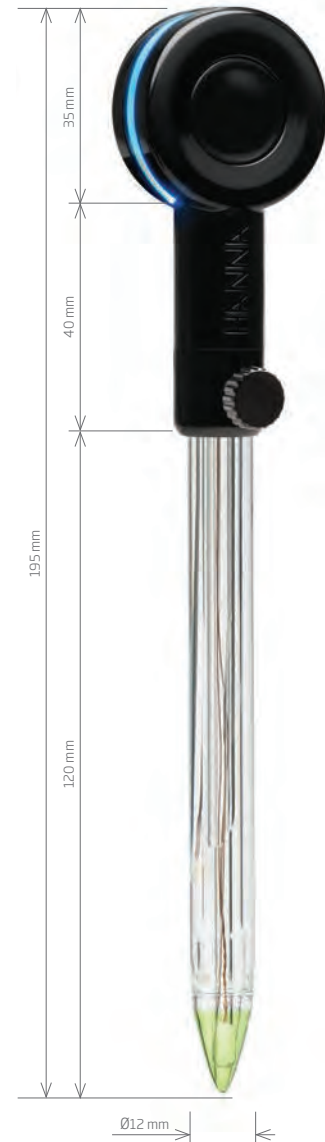
The refillable HI12922 has three ceramic junctions in the reference cell. All pH electrodes have a reference junction that provides continuity between the internal reference wire and the sample. Utilizing a triple ceramic junction design allows for a higher flow rate of fill solution which helps provide for a fast and stable response in damp soil and soilless media.

Refillable

HI12922 is a refillable pH electrode. Fill solution from the inside will diffuse through the ceramic junctions as it is used and while stored in storage solution. Electrolyte fill solution should be added to the probe when the level drops more than 1 cm (1/2") from the fill hole in order to maintain a good flow rate sustained by having adequate head pressure (optional).

Built-in Temperature Sensor

The HI12922 has a thermistor temperature sensor built into the tip of the pH electrode. A thermistor based temperature sensor provides for a high accuracy temperature while being in the tip of the electrode allows for a rapid temperature compensated measurement



Includes soil auger



HALO Specifications

HI12922

Measurement Range	0.00 to 12.00 pH
Reference Cell Type	double, Ag/AgCl
Junction Type	triple ceramic
Electrolyte	3.5M KCl (refillable)
Body Material	glass
Tip / Shape	conic
Temperature Operating Range	-5 to 70°C (23 to 158°F)
Body Length/Overall Length	120 mm / 195 mm
Temperature Sensor	integrated
Outer Diameter	12 mm (glass)
Connector Type	Bluetooth Smart (Bluetooth 4.0), 10 m (33') range
Battery Type/Life	CR2032 3V lithium ion / approximately 500 hours
Environment	0 to 50°C (23 to 122°F); electronic module is not waterproof

Ordering Information

HI12922 (HALO) is supplied with HI721319 soil auger, storage solution, cleaning solution, pH 7.01 buffer solution, pH 4.01 buffer solution, fill solution, battery, quality certificate and instruction sheet.



Hanna Lab App

Available on iOS and Android

The first app that turns a smart phone or tablet into a full-featured pH meter.

The Hanna Lab App turns a compatible smart phone or tablet into a full-featured pH meter when used with HALO®. Functions include calibration, measurement, data logging, graphing, and data sharing. Measurement and logging of pH and temperature at one second intervals start as soon as the probe is connected. Measurements can be displayed alone, with tabulated data or as a graph. The graph can be panned and zoomed with pinch-to-zoom technology.



Real-time Data

Displays updated pH and temperature every second

Views



Just the Essentials

Basic view provides measurement information in a clean, straightforward manner.



All Information on Display

Table view is able to display measurement, time and date, annotations, and alarm status in a continuously updated table.



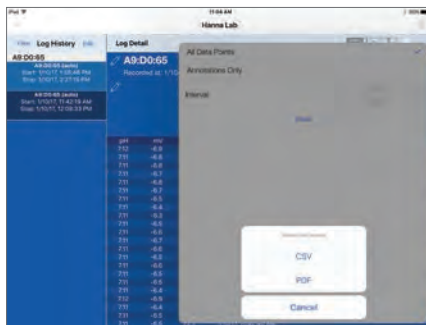
Fluid, Dynamic Graphing

Graph view provides measurement information linearly. Graph axes may be expanded using pinch-to-zoom technology for enhanced viewing



Data Logging

pH	mV	T (°C)	Date	Note	Status
7.219	-11.8	22.9	1/10/17, 2:01:01 PM		
7.211	-11.3	23.0	1/10/17, 2:01:02 PM		
7.209	-11.7	22.9	1/10/17, 2:01:03 PM		
7.207	-11.5	22.9	1/10/17, 2:01:04 PM		
7.200	-11.7	22.9	1/10/17, 2:01:05 PM		
7.200	-11.7	22.9	1/10/17, 2:01:06 PM		
7.200	-11.7	22.9	1/10/17, 2:01:07 PM		
7.200	-11.8	23.0	1/10/17, 2:01:08 PM		
7.202	-11.8	23.0	1/10/17, 2:01:09 PM		
7.203	-11.8	23.0	1/10/17, 2:01:10 PM		
7.203	-11.8	23.0	1/10/17, 2:01:11 PM		
7.203	-11.7	23.0	1/10/17, 2:01:12 PM		
7.200	-11.7	23.0	1/10/17, 2:01:13 PM		
7.200	-11.8	23.0	1/10/17, 2:01:14 PM		
7.200	-11.8	23.0	1/10/17, 2:01:15 PM		
7.200	-11.8	23.0	1/10/17, 2:01:16 PM		
7.200	-11.8	23.0	1/10/17, 2:01:17 PM		
7.200	-11.8	23.0	1/10/17, 2:01:18 PM		
7.200	-11.8	23.0	1/10/17, 2:01:19 PM		
7.200	-11.7	23.0	1/10/17, 2:01:20 PM		
7.200	-11.7	23.0	1/10/17, 2:01:21 PM		
7.200	-11.8	23.0	1/10/17, 2:01:22 PM		
7.200	-11.7	23.0	1/10/17, 2:01:23 PM		
7.200	-11.7	23.0	1/10/17, 2:01:24 PM		



Data-logging

Data is automatically saved every hour. There are four ways to save and share data: All data since last auto save, Annotations only, All data within a timed interval, and Annotations within a timed interval.

Export Data

Share data via email in PDF or CSV format.

Custom Annotations

Saved data points may be annotated with measurement specific information.

GLP (Good Laboratory Practice)



Basic GLP

Displays date and time of current calibration along with probe offset and average slope. For tablet displays, basic GLP can be also displayed in table and graph views.



Full GLP

Displays date and time of current calibration, probe offset, and average slope along with calibrated buffers, mV values, temperature and slopes between each buffer. For tablet displays, full GLP can be also displayed in table and graph views.

Hanna Lab App Specifications*

Range**	-2.000 to 16.000 pH; ±800 mV; -20.0 to 120.0°C (-4.0 to 248.0°F)
Resolution	0.1; 0.01; 0.001 pH; 1; 0.1 mV; 0.1°C (0.1°F)
Accuracy (@25°C/77°F)	±0.005 pH; ±0.3 mV; ±0.5°C (±1.0°F)
Calibration Points	up to five-point calibration with seven standard buffers (1.68, 3.00 (HI10482 only) or 4.01, 6.86, 7.01, 9.18, 10.01, 12.45 pH)
Temperature Compensation**	automatic from -5.0 to 100.0°C – 23.0 to 212.0°F
Compatibility/System Requirements	see www.hannainst.com for latest compatibility requirements

Download Information

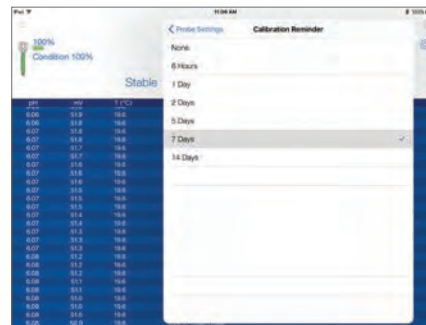


Calibration



Clear and Concise Calibration Screens

The Hanna Lab App allows for calibration of up to five points. The buffer value is automatically detected and temperature corrected to 25.0°C during calibration.



Calibration Reminder

Alerts users when HALO needs calibration.

Additional Features



Measurement Alerts

Readings that exceed user-defined alarm thresholds are highlighted in yellow on the measurement screen, graph, and table. Readings that exceed the probe specifications are highlighted in red.



Settings

Tap the gear icon in the top right corner of the measurement screen to access the Settings menu.



Help and Tutorials:

The Hanna Lab App also features demo probe mode, general app information, general HALO information, pH tutorial, maintenance tutorial, and contact information.

HI98168

pH / Temperature Meter for Soil

The HI98168 is a rugged, waterproof, portable pH meter that allows for the direct measure of soil pH. This meter is supplied with a specialized pH electrode that has a rugged conical tip for insertion in soil.

- **Waterproof**
 - IP67 rated waterproof, rugged enclosure
- **CAL Check™**
 - Alerts users to problems during calibration including dirty/broken electrode, contaminated buffer and overall probe condition
- **Automatic or manual temperature compensation**
 - pH sensors incorporate a built-in temperature sensor
- **Calibration**
 - Up to a five-point calibration with seven standard buffers and five custom buffers
- **Approximately 200 hour battery life**
 - Powered by (4) 1.5V AA batteries
- **Clear display**
 - Dot matrix display with multifunction virtual keys
- **Auto hold**
 - Automatically holds the first stable reading on the display
- **Calibration timeout**
 - Alerts when calibration is due at a specified interval
- **Connectivity**
 - PC connectivity via opto-isolated micro-USB with HI92000 software
- **GLP**
 - GLP data provides data from previous calibration to ensure Good Laboratory Practices are met
- **Intuitive keypad**
 - Important and often used functions such as GLP information, help, range, calibration and backlight have a dedicated button
- **Supplied complete**
 - Each meter is supplied complete with sensor, calibration and cleaning solutions, beakers, PC software and connection cable, instruction manual, quick start guide and batteries in a rugged, custom carrying case



Soil pH Meter

designed for agriculture professionals

Hanna 98 series quality pH meters are rugged and portable with the performance and features of a benchtop. Seven models are available in this series to measure food, milk, meat, yogurt, cheese, beer and soil. Each model is supplied with an application specific electrode and cleaning solutions. These waterproof meters comply to IP67 standards and can be easily operated with one hand.



Backlit Graphic LCD Display

These meters feature a backlit graphic LCD with on-screen help. The graphic display allows for the use of virtual keys to provide for an intuitive user interface.

Waterproof Protection

The meter is enclosed in an IP67 rated waterproof casing and can withstand immersion in water at a depth of 1 m for up to 30 minutes.

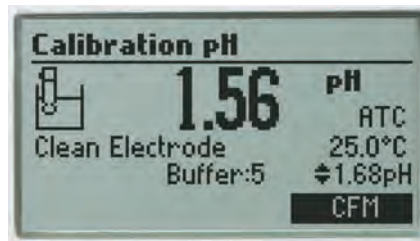


Quick Connect Probe

Each meter features an application specific pH/temperature probe with a quick connect DIN connector to make attaching and removing the probe simple and easy.

Calibration Timeout

Alerts when calibration is due at a specified interval.



pH Calibration

Choose from seven standard pH buffers and five custom values to obtain up to five point calibration and achieve high precision readings with a 0.001 pH resolution and a pH accuracy of ± 0.002 .

Enhanced Calibration

An "out of calibration range" warning can be engaged to keep the user informed of the current calibration and help to avoid performing measurements that are out of the bracketed range.



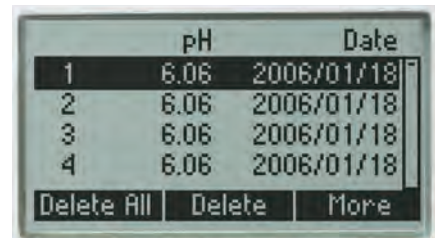
CAL Check™

Hanna's CAL Check maintains a history of past calibrations and monitors the pH electrode and buffers during subsequent calibrations for any signs of wide variances due to a dirty or broken electrode or contaminated pH buffers. During calibration, users are alerted to problems should they occur. After calibration, the electrode's overall condition is displayed as a percentage.



GLP

Comprehensive GLP functions are directly accessible by pressing the GLP key. Calibration data, including date, time and calibration values are stored with logged data for retrieval at a later time.



Data Logging

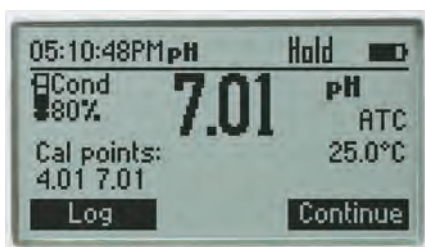
The log-on-demand feature allows users to store up to 200 samples that can be later transferred to a PC with the HI920015 USB cable and HI92000 software.

Automatic Temperature Compensation

pH sensors incorporate a built-in temperature sensor in the tip of the electrode for a fast and accurate temperature compensated value.

Intuitive Keypad

The fitted rubber keypad has dedicated keys for many important and often used functions. These meters also feature two virtual soft keys that navigate the user through setup and logging of data. The interface is intuitive for any user's level of experience.



Auto Hold

Pressing AutoEnd during measurement will automatically hold the first stable reading on the display.



Dedicated Help Key

Contextual help is always available through a dedicated "HELP" key. Clear tutorial messages and directions are available on-screen to quickly and easily guide users through setup and calibration. The help information displayed is relative to the setting/option being viewed.



Setup Screen

Our extensive setup screen features a host of configurable options such as time, date, temperature units and language for help screens and guides.



PC Connectivity

Logged data can be transferred to a Windows compatible PC with the included HI920015 micro USB cable and HI92000 software.

Long Battery Life

The display of the meter has a battery icon indicator to show the remaining power. The meter uses four 1.5V AA batteries that provide up to 200 hours of battery life.



Supplied Complete in a Rugged Custom Carrying Case

Each meter is supplied complete with sensor, calibration and cleaning solutions, beakers, PC software and connection cable, instruction manual, quick start guide and batteries in a rugged, custom carrying case. The inside compartment of the carrying case is thermoformed to securely hold and protect all of the components.

Specifications	HI98168	
pH*	Range	-2.0 to 20.0 pH; -2.00 to 20.00 pH; -2.000 to 20.000 pH
	Resolution	0.1 pH; 0.01 pH; 0.001 pH
	Accuracy	±0.1 pH; ±0.01 pH; ±0.002 pH
	Calibration	up to five-point calibration, seven standard buffers available (1.68, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45) and five custom buffers
	Temperature Compensation	automatic or manual from -20.0 to 120.0°C (-4.0 to 248.0°F)
mV	Range	±2000 mV
	Resolution	0.1 mV
	Accuracy	±0.2 mV
	Relative mV Offset Range	±2000 mV
Temperature*	Range	-20.0 to 120.0 °C (-4.0 to 248.0°F)
	Resolution	0.1°C (0.1°F)
	Accuracy	±0.4°C (±0.8°F) (excluding probe error)
Additional Specifications	pH Probe	HI12923 Glass body, conical tip, refillable pH electrode with internal temperature sensor, quick DIN connector and 1 m (3.3' cable)
	Slope Calibration	from 80 to 110%
	Log-on-demand	Up to 200 samples (100 pH, 100 mV)
	PC Connection	opto-isolated USB with HI92000 software and micro USB cable
	Input Impedance	10 ¹² Ω
	Battery Type / Life	1.5V AA batteries (4) / approximately 200 hours of continuous use without backlight (50 hours with backlight)
	Auto-off	user selectable: 5, 10, 30, 60 min, disabled
	Environment	0 to 50°C (32 to 122°F); RH 100% IP67
	Dimensions / Weight	185 x 93 x 35.2 mm (7.3 x 3.6 x 1.4") / 400 g (14.2 oz.)
Ordering Information	HI98168 is supplied with HI12923 pH electrode, HI721319 ground auger, HI7004M pH 4.01 buffer solution (230 mL), HI7007M pH 7.01 buffer solution (230 mL), HI700663 Cleaning solution sachet for soil deposits, HI700664 Cleaning solution for humus deposits, HI7051M Soil Test Solution (230 mL), 100 mL plastic beaker (2), HI92000 PC software, HI920015 micro USB cable, 1.5V AA batteries (4), quick reference guide, instruction manual, and quality certificate in a HI720161 hard carrying case with custom insert.	



- Optional shockproof silicon rubber boot
- Specially designed to protect your instrument from damage or impact

HI710035 Blue

HI12923

pH / Temperature Probe for Soil

The HI12923 pH electrode that is supplied with the meter is uniquely designed with a conical tip and a triple ceramic junction for improved performance in soils that have a low moisture content. The probe has a built in amplifier to reduce noise from humidity that can effect the probe connection to the meter. The HI12923 connects to the HI98168 with a quick-connect, waterproof DIN connector, allowing for a secure, non-threaded attachment.

Refillable

As electrolyte is lost over time it can be replenished to extend the life of the electrode.

Triple ceramic junction

The outer reference has three ceramic frits that allow electrolyte to flow at a high rate from the inside of the probe to the outside. A higher flow rate allows for a pH measurement of soil with low moisture.

Conical Tip

The conical tip is made of durable LT glass and allows for direct measurement in soils. In the case any rocks are present an auger is provided to make a hole for the probe.

Quick Connect DIN Connector

This secure waterproof connector allows for a single cable to be used for both pH and temperature measurements.



Application Importance

The measurement of pH in agricultural activities is very important due to the influence it has on the growth of the plant. Soil can be acid, neutral or alkaline, according to its pH value. Most plants prefer a pH range from 5.5 to 7.5; but some species prefer more acid or alkaline soils. Nevertheless, every plant requires a particular range of pH, for optimum growth.

Specifications	HI12923
Description	pH electrode
Reference	single, Ag/AgCl
Junction	ceramic, triple / 40-50 µL/h
Electrolyte	KCl 3.5M + AgCl
Max Pressure	0.1 bar
Range	pH: 0 to 12
Recommended Operating Temperature	-5 to 70°C (23 to 158°F) - LT
Tip /Shape	conic (12 x 12 mm)
Temperature Sensor	yes
Amplifier	yes
Body Material	glass
Cable	coaxial; 1 m (3.3')
Connection	quick connect DIN

HI99121

Direct Soil pH Meter

with Measurement Kit

- Simultaneous pH and temperature measurements on a large dual-line LCD display
- User-friendly two button design
- Application specific probe
- Durable IP67 waterproof casing
- Watertight probe connection
- Probe condition indicator
- Automatic pH calibration at one or two points within two memorized buffer sets (standard or NIST)
- On-screen calibration tags
- mV of pH measurement for electrode check
- Selectable temperature unit (°C or °F)
- Auto-off function
- Battery life indication and low battery detection
- Soil preparation solution
 - For higher degrees of accuracy, or for stony ground where the electrode may be damaged, use the included HI7051M soil preparation solution

The HI99121 is the perfect portable pH meter for soil testing. With the HI99121 and HI12923 direct soil pre-amplified pH and temperature probe, users can test both the pH of soil directly or after preparation of a soil slurry with deionized water.

The HI12923 features a conical, rugged tip that can be directly used in soil. A plastic auger is supplied to perforate and loosen the soil prior to sensor measurement. Use this tool to prevent scratching the pH sensitive glass on nutrient crystals or small pebbles.



- Optional shockproof silicon rubber boot
 - Specially designed to protect your instrument from damage or impact

HI710028 Orange
 HI710029 Blue
 HI710030 Green

Specifications	HI99121	
pH	Range*	-2.00 to 16.00 pH / -2.0 to 16.0 pH
	Resolution	0.01 pH / 0.1 pH
	Accuracy (@25°C/77°F)	±0.02 pH / ±0.1 pH
	Calibration	Automatic, one or two-point selectable bufferset standard: 4.01; 7.01; 10.01 or NIST: 4.01; 6.86; 9.18
pH-mV	Range*	±825 mV
	Resolution	1 mV
	Accuracy (@25°C/77°F)	±1 mV
Temperature	Range*	-5.0 to 105.0°C; 23.0 to 221.0°F
	Resolution	0.1°C; 0.1°F
	Accuracy(@25°C/77°F)	±0.5°C (up to 60°C), ±1.0°C (outside); ±1.0°F (up to 140°F), ±2.0°F (outside)
Additional Specifications	Temperature Compensation	automatic, from -5.0 to 105.0°C (23.0 to 221.0°F)
	Probe (included)	HI12923 glass body, pre-amplified pH electrode for soil measurement with internal temperature sensor, DIN connector and 1 m (3.3') cable
	Battery Type / Life	1.5V AAA (3) approx. 1400 hours of continuous use
	Auto-off	user selectable: after 8 min, 60 min or disabled
	Environment	0 to 50°C (32 to 122°F); RH max. 100%
	Meter Dimensions	154 x 63 x 30 mm (6.1 x 2.5 x 1.2")
	Meter Mass (with batteries)	196 g (6.91 oz.)
	Case Ingress Protection Rating	IP67
	Ordering Information	HI99121 is supplied with HI12923 pH/temperature probe with glass body and Quick Connect DIN connector with 1m (3.3') cable, pH 4.01 and 7.01 Buffer sachets, HI700663 electrode cleaning solution sachet for soil deposits, HI700664 electrode cleaning solution sachet for humus deposits, HI7051M soil preparation solution, HI721319 ground auger, 100 mL beaker, 1.5V AAA batteries (3), calibration certificate of meter, calibration certificate of probe, instruction manual and HI710142 rugged carrying case.

Quick Cal

pH/EC Quick Cal Calibration Solution

Quick Cal is for use with Hanna's GroLine pH and/or EC/TDS meters. Using the Quick Cal function found in compatible meters allows for single-point calibration for pH and/or conductivity sensors.

- Calibration solution for Gro line pH and EC/TDS meters
- pH calibration buffer value of pH 6.86
- EC calibration standard value of 5,000 $\mu\text{S}/\text{cm}$ (5.00 mS/cm)
- Safety Data Sheets
 - Safety data sheets for all Hanna solutions are available at hannainst.com or upon request.
- Expiration date
 - The production batch number, expiration date, and temperature correlation table are reported on all Hanna calibration solutions.
- NIST traceability
 - Standardized using a pH meter calibrated by means of two standard solutions prepared from NIST standard reference materials. A conductivity meter and probe calibrated against NIST primary standard solutions or primary standard solutions prepared following NIST guidelines.

GroLine



- Air-tight bottles
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- Single use sachets
 - Light block packaging prevents oxidation from UV light that could alter the value. Every sachet is as fresh as the day it was packaged.



Quick Cal pH/EC Bottles

Code	Size	Certificate of Analysis
HI5036-050	500 mL (GroLine)	•
HI5036-023	230 mL (GroLine)	•
HI5036-012	120 mL (GroLine)	•



Quick Cal pH/EC Sachets

Code	Size	Certificate of Analysis
HI50036P	20 mL sachets, 25 pcs. (GroLine)	•

pH Buffer Solutions

- **Safety Data Sheets**
 - Safety data sheets for all Hanna solutions are available at hannainst.com or upon request.
- **Expiration date**
 - The production batch number, expiration date, and temperature correlation table are reported on all Hanna calibration solutions.
- **NIST traceability**
 - Standardized using a pH meter calibrated by means of two standard solutions prepared from NIST standard reference materials.



- **Air-tight bottles**
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- **Single use sachets**
 - Light block packaging prevents oxidation from UV light that could alter the value. Every sachet is as fresh as the day it was packaged.
- **FDA compliant bottles (HI80xx)**
 - Hanna solutions are offered in opaque, light-tight bottles that meet FDA requirements.

4.01 pH Buffer Solution

This buffer value is widely used in water purification plants, in the food industry, and wherever the pH is expected to be slightly acidic.

4.01 pH @ 25°C - Bottles

Code	Size	FDA Bottle	Certificate of Analysis
HI7004/1G	1 G (3.78 L) (color coded solution)		on request
HI7004/1L	1 L (color coded solution)		on request
HI7004L	500 mL		on request
HI7004L/C	500 mL		•
HI7004C	500 mL (color coded solution)		on request
HI7004M	230 mL		on request
HI7004-050	500 mL (GroLine)		•
HI7004-023	230 mL (GroLine)		•
HI7004-012	120 mL (GroLine)		•
HI8004L	500 mL	•	•
HI8004L/C	500 mL	•	•

4.01 pH @ 25°C - Sachets

Code	Size	Package	Certificate of Analysis
HI70004C	20 mL	25 pcs.	•
HI70004G	20 mL (GroLine)	25 pcs.	•
HI70004P	20 mL	25 pcs.	

4.01 and 7.01 pH @ 25°C - Sachets

Code	Size	Package	Certificate of Analysis
HI77400C	20 mL	10 pcs., 5 ea	•
HI77400P	20 mL	10 pcs., 5 ea	



pH Buffer Solutions



- **Safety Data Sheets**
 - Safety data sheets for all Hanna solutions are available at hannainst.com or upon request.
- **Expiration date**
 - The production batch number, expiration date, and temperature correlation table are reported on all Hanna calibration solutions.
- **NIST traceability**
 - Standardized using a pH meter calibrated by means of two standard solutions prepared from NIST standard reference materials.



7.01 pH @ 25°C - Bottles

Code	Size	FDA Bottle	Certificate of Analysis
HI70071G	1 G (3.78 L) (color coded solution)		on request
HI70071L	1 L (color coded solution)		on request
HI7007C	500 mL (color coded solution)		on request
HI7007L	500 mL		on request
HI7007L/C	500 mL	•	•
HI7007M	230 mL		on request
HI7007-050	500 mL (GroLine)		•
HI7007-023	230 mL (GroLine)		•
HI7007-012	120 mL (GroLine)		•
HI8007L	500 mL	•	•
HI8007L/C	500 mL	•	•

- **Air-tight bottles**
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- **Single use sachets**
 - Light block packaging prevents oxidation from UV light that could alter the value. Every sachet is as fresh as the day it was packaged.
- **FDA compliant bottles (HI80xx)**
 - Hanna solutions are offered in opaque, light-tight bottles that meet FDA requirements.

7.01 pH @ 25°C, and Combination Packs - Sachets

Code	Value	Size	Package	Certificate of Analysis
HI70007C	7.01 pH	20 mL	25 pcs.	•
HI70007G	7.01 pH	20 mL	25 pcs.	•
HI70007P	7.01 pH	20 mL	25 pcs.	•
HI77700P	7.01 pH	20 mL	10 pcs.	•
HI770710C	10.01 & 7.01 pH	20 mL	10 pcs., 5 ea	•
HI770710P	10.01 & 7.01 pH	20 mL	10 pcs., 5 ea	•
HI77100C	1413 µS/cm & 7.01 pH	20 mL	20 pcs., 10 ea	•
HI77100P	1413 µS/cm & 7.01 pH	20 mL	20 pcs., 10 ea	•
HI77200P	1500 mg/L (ppm) & 7.01 pH	20 mL	20 pcs., 10 ea	•
HI77400P	4.01 & 7.01 pH	20 mL	10 pcs., 5 ea	•

7.01 pH Buffer Solution

pH 7.01 is the most widely used among all buffer solutions. For this reason we have prepared it in a wider variety of sizes to meet application demand.



pH Buffer Solutions

- **Safety Data Sheets**
 - Safety data sheets for all Hanna solutions are available at hannainst.com or upon request.
- **Expiration date**
 - The production batch number, expiration date, and temperature correlation table are reported on all Hanna calibration solutions.
- **NIST traceability**
 - Standardized using a pH meter calibrated by means of two standard solutions prepared from NIST standard reference materials.



- **Air-tight bottles**
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- **Single use sachets**
 - Light block packaging prevents oxidation from UV light that could alter the value. Every sachet is as fresh as the day it was packaged.
- **FDA compliant bottles (HI80xx)**
 - Hanna solutions are offered in opaque, light-tight bottles that meet FDA requirements.

10.01 pH Buffer Solution

pH 10.01 solution is commonly used to calibrate equipment used for analyzing basic samples. pH 10.01 buffer solution is available in various sizes to best fit your needs.



10.01 pH @ 25°C - Bottles

Code	Size	FDA Bottle	Certificate of Analysis
HI7010/1G	1 G (3.78 L) (color coded bottle)		on request
HI7010/1L	1 L (color coded bottle)		on request
HI7010L	500 mL		on request
HI7010C	500 mL (color coded solution)		on request
HI7010L/C	500 mL		•
HI7010M	230 mL		on request
HI7010-050	500 mL (GroLine)		•
HI7010-023	230 mL (GroLine)		•
HI7010-012	120 mL (GroLine)		•
HI8010L	500 mL	•	•
HI8010L/C	500 mL	•	•

10.01 pH @ 25°C, and Combination Packs - Sachets

Code	pH Value	Size	Package	Certificate of Analysis
HI70010C	10.01	20 mL	25 pcs.	•
HI70010P	10.01	20 mL	25 pcs.	•
HI770710C	10.01 & 7.01	20 mL	10 pcs., 5 ea	•
HI770710P	10.01 & 7.01	20 mL	10 pcs., 5 ea	•

1.68 pH @ 25°C - Bottles

Code	Size	Certificate of Analysis
HI7001L	500 mL	on request
HI7001M	230 mL	on request

6.00 pH @ 25°C - Bottle

Code	Size	Package
HI70060M	230 mL	bottle

6.86 pH @ 25°C - Bottles

Code	Size	FDA Bottle	Certificate of Analysis
HI7006/1G	1 G (3.78 L)		on request
HI7006/1L	1 L		on request
HI7006L	500 mL		on request
HI7006L/C	500 mL		•
HI7006M	230 mL		on request
HI8006L	500 mL	•	•
HI8006L/C	500 mL	•	•

6.86 pH @ 25°C - Sachets

Code	Size	Package	Certificate of Analysis
HI70006C	20 mL	25 pcs.	•
HI70006P	20 mL	25 pcs.	

8.20 pH @ 25°C - Bottle

Code	Size	Package
HI70082M	230 mL	bottle

8.30 pH @ 25°C - Bottle

Code	Size	Package
HI70083M	230 mL	bottle

9.18 pH @ 25°C - Bottles

Code	Size	FDA Bottle	Certificate of Analysis
HI7009/1G	1 G (3.78 L)		on request
HI7009/1L	1 L		on request
HI7009L	500 mL		on request
HI7009L/C	500 mL		•
HI7009M	230 mL		on request
HI8009L/C	500 mL	•	•
HI8009L	500 mL	•	•

9.18 pH @ 25°C - Sachets

Code	Size	Package	Certificate of Analysis
HI70009C	20 mL	25 pcs.	•
HI70009P	20 mL	25 pcs.	

pH Buffer Solutions

- [Safety Data Sheets](#)
 - Safety data sheets for all Hanna solutions are available at hannainst.com or upon request.
- [Expiration date](#)
 - The production batch number, expiration date, and temperature correlation table are reported on all Hanna calibration solutions.
- [NIST traceability](#)
 - Standardized using a pH meter calibrated by means of two standard solutions prepared from NIST standard reference materials.
- [Air-tight bottles](#)
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- [Single use sachets](#)
 - Light block packaging prevents oxidation from UV light that could alter the value. Every sachet is as fresh as the day it was packaged.
- [FDA compliant bottles \(HI80xx\)](#)
 - Hanna solutions are offered in opaque, light-tight bottles that meet FDA requirements.

1.68 pH Buffer Solution

Plating bath samples, food samples and waste samples are often acidic in nature. To increase accuracy of your measurement at lower pH values, it is important to calibrate your electrode and meter at the appropriate pH. pH 1.68 buffer solution allows you to calibrate your measurement system in the acidic pH range and bracket your samples by using a second value at 4.01 pH or near 7.01 pH.

6.86 pH Buffer Solution

Many of our portable and benchtop instruments may now be calibrated with both pH 6.86 or pH 7.01 buffers.

8.20 and 8.30 pH Buffer Solution

To increase accuracy of your measurement, 8.20 and 8.30 pH buffer solution is available.

9.18 pH Buffer Solution

To increase accuracy of your measurement in an alkaline environment, it is important to calibrate your electrode and meter in that pH range and to preferably bracket your sample values. Hanna offers both pH 9.18 buffer and pH 10.01 buffer to fulfill this requirement.

ORP and Sample Preparation Solutions

- **Safety Data Sheets**
 - Safety data sheets for all Hanna solutions are available at hannainst.com or upon request.
- **Expiration date**
 - The production batch number and expiration date are reported on all Hanna calibration solutions.
- **Air-tight bottles**
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.

ORP Test and Pretreatment Solutions

ORP standard solutions allows users to test the precision of ORP electrodes. For example, by immersing the electrode in HI7021 solution, the reading should be at 240 mV (@25°C/77°F).

If the reading is outside the indicated interval, clean and condition your ORP electrode in Hanna pretreatment solution.

Use HI7092 for oxidizing or HI7091 for reducing pretreatment.

Soil Sample Preparation Solution

HI7051 Soil Sample Preparation Solution is an electrolyte solution used in the measurement of soil pH. The pH of soil is most commonly measured as either a water slurry or electrolyte slurry, where a set ratio of soil:solvent (solvent is water or electrolyte solution) is chosen; common ratios used for soil pH are 1:1, 1:2 or 1:5, where more solvent than soil is used when soils-to-be-analyzed contain high amounts of organic matter or clay. Use of an electrolyte solution is usually preferred as it is less affected by soil electrolyte concentration and provides a more consistent measurement for soils whose salt content may fluctuate as a result of seasonal conditions or crop residues.

Using the HI7051 solution prior to taking a measurement provides for a more accurate pH reading of soil samples



ORP Test and Pretreatment Solution Bottles

Code	Description	Size	Certificate of Analysis
HI7021L	240 mV ORP solution for platinum and gold electrodes	500 mL	on request
HI7021M	240 mV ORP solution for platinum and gold electrodes	230 mL	on request
HI7022L	470 mV ORP solution for platinum and gold electrodes	500 mL	on request
HI7022M	470 mV ORP solution for platinum and gold electrodes	230 mL	on request
HI7091L	reducing pretreatment solution (2 components)	500 mL + 14g (set)	
HI7092L	oxidizing pretreatment solution for ORP electrodes	500 mL	
HI7092M	oxidizing pretreatment solution for ORP electrodes	230 mL	

ORP Test and Pretreatment Solution Sachets

Code	Description	Size	Package	Certificate of Analysis
HI70022P	470 mV ORP solution for platinum and gold electrodes	20 mL	25 pcs.	•

Sample Preparation Solution Bottles

Code	Description	Size
HI7051M	soil sample preparation solution	230 mL
HI7051L	soil sample preparation solution	500 mL
HI70960	preparation solution for solid or semi-solid samples	30 mL



Electrode Storage Solutions

- Designed for storing any pH or ORP electrode.
- Special formulation
 - Special formulation to minimize microbial growth and osmotic/diffusion effects between the solution and inner reference electrolyte
- Expiration date
 - The production batch number and expiration date are reported on all Hanna calibration solutions.



- Air-tight bottles
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- Single use sachets
 - Light block packaging prevents oxidation from UV light that could alter the value. Every sachet is as fresh as the day it was packaged.
- FDA compliant bottles (HI803xx)
 - Hanna solutions are offered in opaque, light-tight bottles that meet FDA requirements.

HI70300 is a storage solution prepared with reagent grade chemicals that can be used to ensure optimum performance of your pH and ORP electrodes.

To ensure an optimum response time, the glass sensor tip and the reference junction of the pH electrode should be kept moist and not be allowed to dry out when not in use.

Placing the pH electrode in a small glass filled with storage solution or replacing the solution in the protective cap is a suitable way to store the electrode. Storage solution should also be used to rehydrate the electrode after a cleaning procedure by soaking for at least one hour before taking measurements



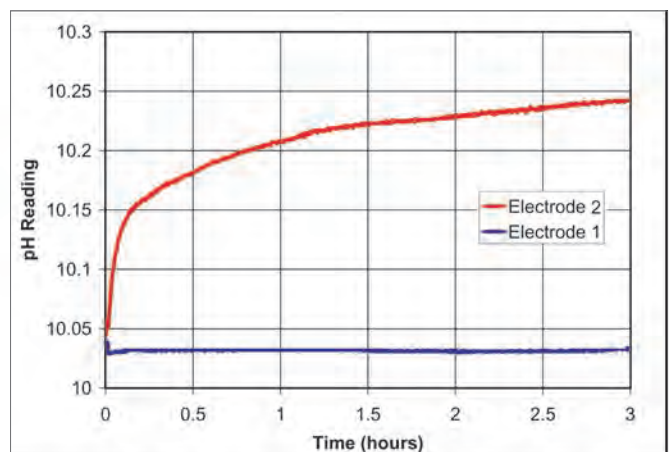
Electrode Storage Solutions

Code	Description	Package
HI70300L	storage solution for pH and ORP electrodes	500 mL bottle
HI70300M	storage solution for pH and ORP electrodes	230 mL bottle
HI70300S	storage solution for pH and ORP electrodes	30 mL bottle
HI70300G	storage solution for pH and ORP electrodes	20 mL sachet (25)
HI70300-050	storage solution for pH and ORP electrodes (GroLine)	500 mL bottle
HI70300-023	storage solution for pH and ORP electrodes (GroLine)	230 mL bottle
HI70300-012	storage solution for pH and ORP electrodes (GroLine)	120 mL bottle
HI80300L	storage solution for pH and ORP electrodes	500 mL FDA bottle
HI80300M	storage solution for pH and ORP electrodes	230 mL FDA bottle
HI5300-12	storage solution for pH and ORP electrodes	120 mL bottle



Electrode Cleaning Solutions for a Top Performing Sensor

- **Expiration date**
 - The production batch number and expiration date are reported on all Hanna calibration solutions.
- **Air-tight bottles**
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- **Single use sachets**
 - Light block packaging prevents oxidation from UV light that could alter the value. Every sachet is as fresh as the day it was packaged.
- **FDA compliant bottles (HI80xx)**
 - Hanna solutions are offered in opaque, light-tight bottles that meet FDA requirements.



Electrode 1 has been properly cleaned before calibration.
 Electrode 2 has not been properly cleaned.

Electrodes can become dirty from use and will produce inaccurate results even as they read correctly in a pH buffer. Hanna's cleaning solutions eliminate impurities and residues that are left on electrode surfaces when immersed in samples during measurement and stored incorrectly. Hanna suggests cleaning the bulb and junction of your electrode on a regular basis to ensure that the probe is always clean and prevent any clogging of the junction.

General Use Electrode Cleaning Solutions - Bottles

Code	Application	Package
HI7061L	general purpose	500 mL bottle
HI7061-050	general purpose (GroLine)	500 mL bottle
HI7061-023	general purpose (GroLine)	230 mL bottle
HI7061-012	general purpose (GroLine)	120 mL bottle
HI7073L	proteins	500 mL bottle
HI7073M	proteins	230 mL bottle
HI7074L	inorganic substances	500 mL bottle
HI7074M	inorganic substances	230 mL bottle
HI7077L	oil and fats	500 mL bottle
HI7077M	oil and fats	230 mL bottle
HI8061L	general purpose	500 mL FDA bottle
HI8073L	proteins	500 mL FDA bottle
HI8077L	oil and fats	500 mL FDA bottle



Specific Electrode Cleaning Solutions - Bottles

Code	Description	Size
HI70621L	cleaning Solution for skin grease and sebum (Cosmetic Industry)	500 mL
HI70630L	acid cleaning solution for meat grease and fats (food industry)	500 mL
HI70631L	alkaline cleaning solution for meat grease and fats (food industry)	500 mL
HI70632L	cleaning and disinfection solution for blood products	500 mL
HI70635L	cleaning solution for wine deposits (winemaking)	500 mL
HI70636L	cleaning solution for wine stains (winemaking)	500 mL
HI70640L	cleaning solution for milk deposits (food industry)	500 mL
HI70641L	cleaning and disinfection solution for dairy products (food industry)	500 mL
HI70642L	cleaning solution for cheese deposits (food industry)	500 mL
HI70643L	cleaning and disinfection solution for yogurt products (food industry)	500 mL
HI70663L	cleaning solution for soil deposits (agriculture)	500 mL
HI70664L	cleaning solution for humus deposits (agriculture)	500 mL
HI70670L	cleaning solution for salt deposits (industrial processes)	500 mL
HI70671L	cleaning and disinfection solution for algae, fungi and bacteria (industrial processes)	500 mL
HI70681L	cleaning solution for ink stains	500 mL
HI70682L	cleaning solution for brewing deposits	500 mL



General Use Electrode Cleaning Solutions - Sachets

Code	Application	Package
HI70000P	rinsing	20 mL sachet (25)
HI700601P	general purpose	20 mL sachet (25)
HI70061G	general purpose (GroLine)	20 mL sachet (25)

Specific Electrode Cleaning Solutions - Sachets

Code	Description	Qty/Size
HI700620P	cleaning Solution for skin residuals	20 mL (25)
HI700621P	cleaning Solution for skin grease and sebum (Cosmetic Industry)	20 mL (25)
HI700630P	acid cleaning solution for meat grease and fats (food industry)	20 mL (25)
HI700635P	cleaning solution for wine deposits (winemaking)	20 mL (25)
HI700636P	cleaning solution for wine stains (winemaking)	20 mL (25)
HI700640P	cleaning solution for milk deposits (food industry)	20 mL (25)
HI700641P	cleaning and disinfection solution for dairy products (food industry)	20 mL (25)
HI700642P	cleaning solution for cheese deposits (food industry)	20 mL (25)
HI700643P	cleaning and disinfection solution for yogurt products (food industry)	20 mL (25)
HI700661P	general purpose cleaning solution for agriculture	20 mL (25)
HI700663P	cleaning solution for soil deposits (agriculture)	20 mL (25)
HI700664P	cleaning solution for humus deposits (agriculture)	20 mL (25)
HI700670P	cleaning solution for salt deposits (industrial processes)	20 mL (25)
HI700671P	cleaning and disinfection solution for algae, fungi and bacteria (industrial processes)	20 mL (25)
HI700680P	cleaning solution for cellulose deposits	20 mL (25)
HI700681P	cleaning solution for ink stains	20 mL (25)
HI700682P	cleaning solution for beer and wort (beermaking)	20 mL (25)

HI993310

Direct Soil Activity and Solution Conductivity Measurement Kit

- Automatic temperature compensation (ATC)
- Battery Error Prevention System (BEPS)
 - Alerts the user when the battery is low

The HI993310 is an instrument that has been designed to address the need for fast and accurate conductivity measurements in soil and liquids. It is supplied with two probes: HI76305 with stainless steel, conical tip for direct soil measurement and HI76304 for fertilizer enriched solutions.

The HI993310 measures the soil conductivity in EC (mS/cm) as well as soil activity (g/L). The different scales can be selected through two keys on the front panel and two separate LEDs indicate which parameter is being tested. In addition, HI993310 is equipped with an alarm LED that illuminates if the soil is too dry or nutritive substances such as potassium or nitrogen are lacking. Demineralized water can be added to the soil prior to proceeding with further tests.

Direct soil measurement is facilitated by the stainless steel HI76305 probe. Once inserted into the ground, the user simply waits until the meter displays the value read by the auger-like probe.

Why this meter is so important...

Conductivity is an important factor in greenhouses and hydroponics and is measured in soil as well as in fertilizer solutions since it is an excellent indication of the presence of nutritive salts. Soil conductivity is checked before and after fertilization to establish its effectiveness as well as ensuring that the soil is not too saline or damaging to the plant roots.

Conductivity of the irrigation water and fertilizer mixes is checked to make sure values are within an acceptable range and a correct fertilizer concentration strength is being applied.



Specifications	HI993310	
EC	Range	0.00 to 19.99 mS/cm
	Resolution	0.01 mS/cm
	Accuracy (@25°C/77°F)	±2% F.S. (0 to 15.00 mS/cm; excluding probe error)
Soil Activity	Range	0.00 to 1.00 g/L
	Resolution	0.01 g/L
	Accuracy (@25°C/77°F)	±2% F.S. (0 to 15.00 mS/cm; excluding probe error)
Additional Specifications	Calibration	Conductivity: Manual, one-point through knob Soil Activity: calibrated through the conductivity range calibration
	Temperature Compensation	automatic from 0 to 50°C (32 to 122°F), β=2%/°C
	Probes	HI76305 stainless steel conductivity probe with internal temperature sensor, DIN connector and 1 m (3.3') cable for direct soil measurement (included); HI76304 conductivity probe with internal temperature sensor, DIN connector and 1 m (3.3') cable for measurement in soil slurry or water sample (included)
	Battery Type / Life	9V / approximately 100 hours of continuous use
	Environment	0 to 50°C (32 to 122°F); RH max 95% non-condensing
	Dimensions	185 x 82 x 52 mm (7.3 x 3.2 x 2.0")
	Weight	275 g (9.7 oz.)
Ordering Information	HI993310 is supplied with HI76304 conductivity probe, HI76305 direct soil conductivity probe, battery, instructions and rugged carrying case.	

EC Calibration Solutions

Quality Solutions for Laboratory Applications

- **Safety Data Sheets**
 - Safety data sheets for all Hanna solutions are available at hannainst.com or upon request.
- **Expiration date**
 - The production batch number, expiration date, and temperature correlation table are reported on all Hanna calibration solutions.
- **NIST traceability**
 - Standardized using a conductivity meter and probe calibrated against NIST primary standard solutions or primary standard solutions prepared following NIST guidelines.
- **Air-tight bottles**
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- **FDA compliant bottles (HI80xx)**
 - Hanna solutions are offered in opaque, light-tight bottles that meet FDA requirements.
- **High Accuracy Solutions (HI60xx)**
 - HI60xx high accuracy solutions are also available and are supplied with a certificate of analysis.



84 µS/cm Calibration Solution

This 84 µS/cm conductivity solution makes it possible to calibrate instruments with a conductivity scale of up to 200 µS/cm, in the measurement of pure or distilled water.

84 µS/cm Bottles

Code	EC Value @25°C	Size	Package	FDA Bottle	Certificate of Analysis
HI6033	84 µS/cm	500 mL	1 bottle		•
HI7033/1L	84 µS/cm	1 L	1 bottle		
HI7033L	84 µS/cm	500 mL	1 bottle		
HI7033M	84 µS/cm	230 mL	1 bottle		
HI5033-12	84 µS/cm	120 mL	1 bottle		
HI8033L	84 µS/cm	500 mL	1 bottle	•	•

EC Calibration Solutions

Quality Solutions for Laboratory Applications

- **Safety Data Sheets**
 - Safety data sheets for all Hanna solutions are available at hannainst.com or upon request.
- **Expiration date**
 - The production batch number, expiration date, and temperature correlation table are reported on all Hanna calibration solutions.
- **NIST traceability**
 - Standardized using a conductivity meter and probe calibrated against NIST primary standard solutions or primary standard solutions prepared following NIST guidelines.
- **Air-tight bottles**
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- **Single use sachets**
 - Light block packaging prevents oxidation from UV light that could alter the value. Every sachet is as fresh as the day it was packaged.
- **FDA compliant bottles (HI80xx)**
 - Hanna solutions are offered in opaque, light-tight bottles that meet FDA requirements.
- **High Accuracy Solutions (HI60xx)**
 - HI60xx high accuracy solutions are also available and are supplied with a certificate of analysis.



1413 µS/cm Bottles

Code	EC Value @25°C	Size	Package	FDA Bottle	Certificate of Analysis
HI6031	1413 µS/cm	500 mL	1 bottle		•
HI7031/1G	1413 µS/cm	1 G (3.78 L)	1 bottle		
HI7031/1L	1413 µS/cm	1 L	1 bottle		
HI7031L	1413 µS/cm	500 mL	1 bottle		
HI7031L/C	1413 µS/cm	500 mL	1 bottle		•
HI7031M	1413 µS/cm	230 mL	1 bottle		
HI5031-12	1413 µS/cm	120 mL	1 bottle		
HI7031-023	1.41 mS/cm	230 mL (GroLine)	1 bottle		•
HI7031-012	1.41 mS/cm	120 mL (GroLine)	1 bottle		•
HI8031L	1413 µS/cm	500 mL	1 bottle	•	•

1413 µS/cm Sachets

Code	EC Value @25°C	Size	Package	Certificate of Analysis
HI70031C	1413 µS/cm	20 mL	25 sachets	•
HI70031G	1.41 mS/cm	20 mL (GroLine)	25 sachets	•
HI70031P	1413 µS/cm	20 mL	25 sachets	
HI77100C	1413 µS/cm & pH 7.01	20 mL	20 sachets (10 ea)	•
HI77100P	1413 µS/cm & pH 7.01	20 mL	20 sachets (10 ea)	

1413 µS/cm Calibration Solution

The 1413 µS/cm calibration solution is best suited for general use. This solution is also available in combined sachet kits with Hanna pH 7 buffer for easy calibration of multiparameter instruments.



EC Calibration Solutions

Quality Solutions for Laboratory Applications

- **Safety Data Sheets**
 - Safety data sheets for all Hanna solutions are available at hannainst.com or upon request.
- **Expiration date**
 - The production batch number, expiration date, and temperature correlation table are reported on all Hanna calibration solutions.
- **NIST traceability**
 - Standardized using a conductivity meter and probe calibrated against NIST primary standard solutions or primary standard solutions prepared following NIST guidelines.
- **Air-tight bottles**
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- **Single use sachets**
 - Light block packaging prevents oxidation from UV light that could alter the value. Every sachet is as fresh as the day it was packaged.
- **FDA compliant bottles (HI80xx)**
 - Hanna solutions are offered in opaque, light-tight bottles that meet FDA requirements.



5000 µS/cm Calibration Solution

This calibration solution is ideal for applications that need to achieve higher reading accuracies in a conductivity scale between 2,000 µS/cm and 10000 µS/cm. This solution is widely used in agriculture for monitoring and preparing nutrient solutions for proper crop production.

5000 µS/cm Bottles

Code	EC Value @25°C	Size	Package	FDA Bottle	Certificate of Analysis
HI7039/1L	5000 µS/cm	1 L	1 bottle		
HI7039L	5000 µS/cm	500 mL	1 bottle		
HI7039M	5000 µS/cm	230 mL	1 bottle		
HI7039-023	5000 µS/cm	230 mL (GroLine)	1 bottle		•
HI7039-012	5000 µS/cm	120 mL (GroLine)	1 bottle		•
HI8039L	5000 µS/cm	500 mL	1 bottle	•	•



5000 µS/cm Sachets

Code	EC Value @25°C	Size	Package	Certificate of Analysis
HI70039C	5000 µS/cm	20 mL	25 sachets	•
HI70039G	5000 µS/cm	20 mL (GroLine)	25 sachets	•
HI70039P	5000 µS/cm	20 mL	25 sachets	

EC Calibration Solutions

Quality Solutions for Laboratory Applications

- **Safety Data Sheets**
 - Safety data sheets for all Hanna solutions are available at hannainst.com or upon request.
- **Expiration date**
 - The production batch number, expiration date, and temperature correlation table are reported on all Hanna calibration solutions.
- **NIST traceability**
 - Standardized using a conductivity meter and probe calibrated against NIST primary standard solutions or primary standard solutions prepared following NIST guidelines.
- **Air-tight bottles**
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- **Single use sachets**
 - Light block packaging prevents oxidation from UV light that could alter the value. Every sachet is as fresh as the day it was packaged.
- **FDA compliant bottles (HI80xx)**
 - Hanna solutions are offered in opaque, light-tight bottles that meet FDA requirements.



12880 µS/cm Bottles

Code	EC Value @25°C	Size	Package	FDA Bottle	Certificate of Analysis
HI7030/1G	12880 µS/cm	1 G (3.78 L)	1 bottle		
HI7030/1L	12880 µS/cm	1 L	1 bottle		
HI7030L	12880 µS/cm	500 mL	1 bottle		
HI7030L/C	12880 µS/cm	500 mL	1 bottle		•
HI7030M	12880 µS/cm	230 mL	1 bottle		
HI5030-12	12880 µS/cm	120 mL	1 bottle		
HI8030L	12880 µS/cm	500 mL	1 bottle	•	•

12880 µS/cm Sachets

Code	EC Value @25°C	Size	Package	Certificate of Analysis
HI70030C	12880 µS/cm	20 mL	25 sachets	•
HI70030P	12880 µS/cm	20 mL	25 sachets	

12880 µS/cm Calibration Solution

The 12880 µS/cm (12.88 mS/cm) calibration solution is widely used to assure the proper performance of conductivity meters with a scale higher than 10 mS/cm.



EC Calibration Solutions

Quality Solutions for Laboratory Applications

- **Safety Data Sheets**
 - Safety data sheets for all Hanna solutions are available at hannainst.com or upon request.
- **Expiration date**
 - The production batch number, expiration date, and temperature correlation table are reported on all Hanna calibration solutions.
- **NIST traceability**
 - Standardized using a conductivity meter and probe calibrated against NIST primary standard solutions or primary standard solutions prepared following NIST guidelines.
- **Air-tight bottles**
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- **FDA compliant bottles (HI80xx)**
 - Hanna solutions are offered in opaque, light-tight bottles that meet FDA requirements.



80000 µS/cm Calibration Solution

The 80,000 µS/cm calibration solution is needed for the proper calibration of instrumentation used to measure high conductivity samples such as wastewater, solutions with suspended solids and plating baths.

This calibration solution is also ideal for use in the agroalimentary sector.

111800 µS/cm Calibration Solution

This calibration solution is useful to calibrate instrumentation used to measure samples with conductivity higher than 100 mS/cm (100,000 µS/cm).

In fact, this solution makes it possible to calibrate instruments that perform under conditions of high salt concentrations.

This calibration solution is ideal for use in systems where phase limits have to be detected (e.g. separation of a substance from water), monitoring of bottle washing plants, beverage controls, check of acids or bases in electrodeposition processes and some plating baths.

80000 µS/cm Bottles

Code	EC Value @25°C	Size	Package	FDA Bottle	Certificate of Analysis
HI7034/1L	80000 µS/cm	1 L	1 bottle		
HI7034L	80000 µS/cm	500 mL	1 bottle		
HI7034M	80000 µS/cm	230 mL	1 bottle		
HI5034-12	80000 µS/cm	120 mL	1 bottle		
HI8034L	80000 µS/cm	500 mL	1 bottle	•	•

111800 µS/cm Bottles

Code	EC Value @25°C	Size	Package	FDA Bottle	Certificate of Analysis
HI7035/1L	111800 µS/cm	1 L	1 bottle		
HI7035L	111800 µS/cm	500 mL	1 bottle		
HI7035M	111800 µS/cm	230 mL	1 bottle		
HI8035L	111800 µS/cm	500 mL	1 bottle	•	•

TDS Calibration Solutions

Quality Solutions for Laboratory Applications

- Safety data sheets
 - Safety data sheets for all Hanna solutions are available at hannainst.com or upon request.
- Expiration date
 - The production batch number, expiration date, and temperature correlation table are reported on all Hanna calibration solutions.
- NIST traceability
 - Standardized using a conductivity meter and probe calibrated against NIST primary standard solutions or primary standard solutions prepared following NIST guidelines.
- Air-tight bottles
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- Single use sachets
 - Light block packaging prevents oxidation from UV light that could alter the value. Every sachet is as fresh as the day it was packaged.



TDS Bottles

Code	TDS Value @25°C	Size	Package	Certificate of Analysis
HI6032	1382 mg/L (ppm)	500 mL	1 bottle	•
HI7032/1L	1382 mg/L (ppm)	1 L	1 bottle	
HI7032L	1382 mg/L (ppm)	500 mL	1 bottle	
HI7032M	1382 mg/L (ppm)	230 mL	1 bottle	
HI7036/1L	12.41 g/L (ppt)	1 L	1 bottle	
HI7036L	12.41 g/L (ppt)	500 mL	1 bottle	
HI70442/1L*	1500 mg/L (ppm)	500 mL	1 bottle	
HI70442L*	1500 mg/L (ppm)	500 mL	1 bottle	
HI70442M*	1500 mg/L (ppm)	230 mL	1 bottle	

TDS Sachets

Code	TDS Value @25°C	Size	Package	Certificate of Analysis
HI70032C	1382 mg/L (ppm)	20 mL	25 sachets	•
HI70032P	1382 mg/L (ppm)	20 mL	25 sachets	
HI70038C	6.44 g/L (ppt)	20 mL	25 sachets	•
HI70038P	6.44 g/L (ppt)	20 mL	25 sachets	
HI70080C	800 mg/L (ppm)	20 mL	25 sachets	•
HI70080P	800 mg/L (ppm)	20 mL	25 sachets	
HI70442P*	1500 mg/L (ppm)	20 mL	25 sachets	
HI77200P*	1500 mg/L (ppm) & pH 7.01	20 mL	20 sachets (10 ea)	

TDS Solutions

Hanna TDS calibration solutions are prepared against a NIST traceable potassium chloride solution.

Hanna TDS solutions have the lot number and expiration date clearly marked on the label and are air tight with a tamper-proof seal to ensure the quality of the solution. Hanna's line of TDS calibration solutions have been specially formulated to have an expiration of 5 years from the date of manufacture for an unopened bottle.



Quick Cal

pH/EC Quick Cal Calibration Solution

Quick Cal is for use with Hanna's GroLine pH and/or EC/TDS meters. Using the Quick Cal function found in compatible meters allows for single-point calibration for pH and/or conductivity sensors.

- Calibration solution for Gro line pH and EC/TDS meters
- pH calibration buffer value of pH 6.86
- EC calibration standard value of 5,000 $\mu\text{S}/\text{cm}$ (5.00 mS/cm)
- Safety Data Sheets
 - Safety data sheets for all Hanna solutions are available at hannainst.com or upon request.
- Expiration date
 - The production batch number, expiration date, and temperature correlation table are reported on all Hanna calibration solutions.
- NIST traceability
 - Standardized using a pH meter calibrated by means of two standard solutions prepared from NIST standard reference materials. A conductivity meter and probe calibrated against NIST primary standard solutions or primary standard solutions prepared following NIST guidelines.
- Air-tight bottles
 - Air tight bottle with tamper-proof seal of freshness to ensure quality.
- Single use sachets
 - Light block packaging prevents oxidation from UV light that could alter the value. Every sachet is as fresh as the day it was packaged.



GroLine

Quick Cal pH/EC Bottles

Code	Size	Certificate of Analysis
HI5036-050	500 mL (GroLine)	•
HI5036-023	230 mL (GroLine)	•
HI5036-012	120 mL (GroLine)	•

Quick Cal pH/EC Sachets

Code	Size	Certificate of Analysis
HI50036P	20 mL sachets, 25 pcs. (GroLine)	-

Seawater Salinity Calibration Solutions

HI7037 is a premium quality calibration solution for seawater salinity according to the 1902 International Council for the Exploration of the Sea (ICES) percent scale. Hanna calibration solutions have the lot number and expiration date clearly marked on the label. All bottles are air tight with a tamper-proof seal to ensure the quality of the solution. Hanna's line of calibration solutions have been specially formulated to have an expiration of 5 years from the date of manufacture for an unopened bottle.

- NaCl calibration solution for % readings of salinity.
- Air tight bottle with tamper-proof seal to ensure quality.
- Lot number and expiration date printed on each label.



Salinity Bottles

Code	Description	Size	Package
HI7037L	100% NaCl	500 mL	1 bottle
HI7037M	100% NaCl	230 mL	1 bottle

Salinity Sachets

Code	Description	Size	Package
HI70024P	35.00 ppt	20 mL	25 pcs

Multiparameter Photometers

with Digital pH Electrode Input

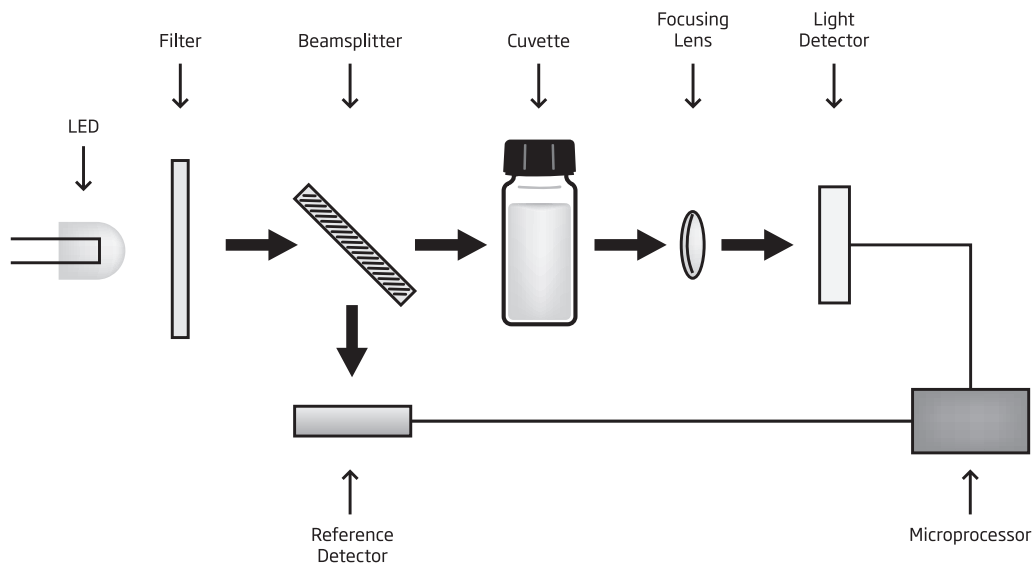


Since 1978, Hanna has introduced instruments that tailor to the needs of a specific application or industry. From this philosophy we have created Application Designed Photometers to satisfy the needs of your specific application or industry.

Aquaculture	HI83303
Boilers & Cooling Towers	HI83305
Environmental Analysis	HI83306
Laboratory Analyses	HI83300
Nutrient Analyses	HI83225
Pool and Spa Applications	HI83326
Water Conditioning	HI83308

- **Advanced optical system**
 - Innovative optical design that utilizes a reference detector and focusing lens to eliminate errors from changes in the light source and from imperfections in the glass cuvette.
- **Up to 73 different programmed methods measuring 40 key water and wastewater quality parameters.**
- **Absorbance mode**
 - Absorbance measurement mode for performance verification and can also be used to plot a custom concentration versus absorbance curve useful for user-supplied chemistry and for teaching students about photometry.
- **High performance pH meter** that uses advanced digital pH/temperature electrodes.





Improved Optical System

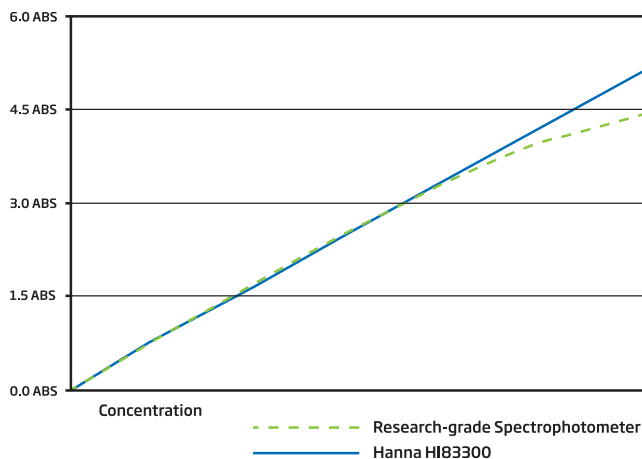
HI83300 family is designed with an innovative optical system that incorporates a beam splitter so that light can be used for absorbance readings and for a reference detector. The reference detector monitors the intensity of light and modulates when there is drift due to power fluctuation or the heating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

High Efficiency LED Light Source

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

Quality Narrow Band Interference Filters

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



Reference Detector for a Stable Light Source

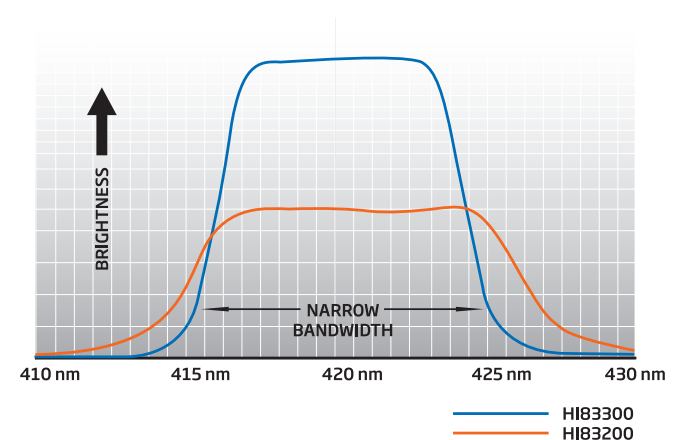
A beam splitter is used as part of the internal reference system of the HI83300 photometer. The reference detector compensates for any drift due to power fluctuations or ambient temperature changes. Now you can rely on a stable source of light.

Large Cuvette Size

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

Focusing Lens for Greater Light Yield

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



- Improved optical filters – higher wavelength accuracy and light throughput



Connectivity



① pH Connectivity

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

② Dual Power Supply

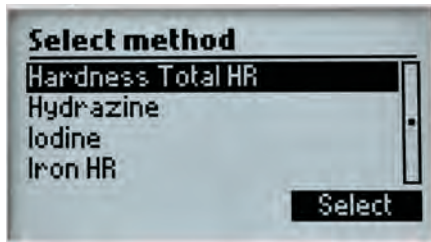
What makes the HI83300 family such versatile meters is their ability to be used as a portable or benchtop meter. Equipped with a rechargeable lithium ion battery, these meters can easily be brought on the production room floor or taken for measurements on the move. This long-

lasting battery lasts up to 500 photometer measurements or 50 hours of continuous pH measurements. To further preserve battery life, the auto-off feature automatically shuts off the meter after 15 minutes of inactivity. If being used on a benchtop, a power supply can be plugged into the micro USB port at the back of the meter.

② ③ USB Connectivity

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

Photometer Capabilities



Concentration Measurement Function

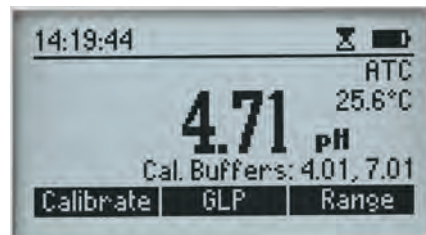
Users can access the menu of measurement methods with the simple press of a button. Low, medium, and high range methods of several parameters are available for users to obtain a high accuracy reading. Each method is assigned a concentration unit of measure. Parameters can be expressed in different chemical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

CAL Check™ Functionality

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

Built-in Reaction Timer

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



pH Measurement

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



Large Cuvettes

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

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



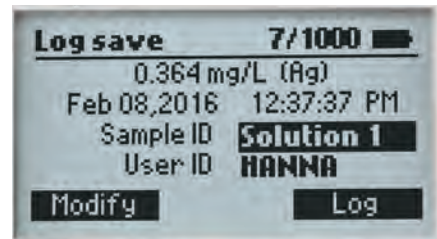
Absorbance Measurement Mode

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

Data Management Capabilities

User ID and Sample ID

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



Data Management

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

USB for Data Transfer

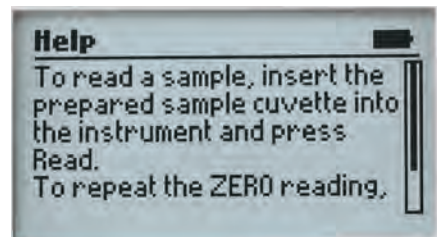
Two USB ports are provided for transferring data. One port allows the data to be transferred to a flash drive while the other USB is used for direct connection to a computer. All data is transferred as a .csv file that can be used with many spreadsheet programs for documentation.

Display Features



Backlit Graphic LCD Display

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



Intuitive Display

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



General Specifications for all Models

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

General Accessories



HI83300-100 sample preparation kit consisting of activated carbon for 50 tests, demineralizer for preparation of 10 L deionized water (100 g), 170 mL graduated beaker, 100 mL beaker, 3 mL pipette, 60 mL syringe, 5 mL syringe, graduated cylinder, spoon, funnel, paper filters (25)



HI72083300 carrying case for HI83300 family



HI920015 USB to micro USB cable connector



HI740224 plastic beaker 170 mL (6)



HI740225 60 mL graduated syringe



HI740226 5 mL graduated syringe



HI76404A electrode holder for HI83300 family



HI731318 cuvette cleaning cloth (4)



HI731331 cuvette (4)
HI731335N caps for cuvette (4)



HI93703-55 activated carbon for 50 tests



HI11310 digital combination pH electrode



HI740036P beaker, plastic 100 mL (10)
HI740034P cap for 100 mL plastic beaker (10)



HI75110/230 USB power supply

HI83325

Multiparameter Photometer

with Digital pH Electrode Input
for Nutrient Analysis



The HI83325 benchtop photometer measures 8 different key water quality parameters using 9 different methods. This photometer features an innovative optical system that uses LEDs, narrow band interference filters, focusing lens and both a silicon photodetector for absorbance measurement and a reference detector to maintain a consistent light source ensures accurate and repeatable photometric readings every time.

Consistent and thorough monitoring of plant nutrients is essential to maintaining healthy growth and reproduction. This is easy with the HI83325, a comprehensive way to monitor vital plant nutrients such as potassium, calcium and magnesium. Required in large quantities, potassium plays a vital role in water uptake and enzyme regulation. Calcium helps to strengthen plant cell walls protecting against heat stress while magnesium helps build a strong immune system.

• Advanced optical system

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

• Backlit 128 x 64 Pixel Graphic LCD Display

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

• Built-in Reaction Timer for Photometric Measurements

- The measurement is taken after the countdown timer expires.
- Countdown timer ensures that all readings are taken at the appropriate reaction intervals regardless of user for better consistency in measurements

• Absorbance mode

- Hanna's exclusive CAL Check™ cuvettes for validation of light source and detector

- Allows for the user to plot concentration versus absorbance for a specific wavelength for use with user supplied chemistry or for teaching principles of photometry

• Units of Measure

- Appropriate unit of measure along with chemical form is displayed along with reading

• Result Conversion

- Automatically convert readings to other chemical forms with the touch of a button

• Cuvette Cover

- Aids in preventing stray light from affecting measurements

• Data Logging

- Up to 1000 photometric and pH readings can be stored by simply pressing the dedicated LOG button. Logged readings are just as easily recalled by pressing the RCL button
- Sample ID and User ID information can be added to a logged reading using alphanumeric keypad

• Connectivity

- Logged readings can be quickly and easily transferred to a flash drive using the USB-A host port or to a computer using the micro USB-B port
- Data is exported as a .CSV file for use with common spreadsheet programs

• Rechargeable Battery

- Li-polymer rechargeable battery lasts for 500 measurements or 50 hours of pH measurement

• Battery Status Indicator

- Indicates the amount of battery life left

• Error Messages

- Photometric error messages
- pH calibration messages include clean electrode, check buffer and check probe



HI83325-11

- Digital pH Electrode Input

- Measure pH and temperature with a single probe
- Good Laboratory Practice (GLP) to track calibration information including date, time, buffers used, offset and slope for traceability
- pH CAL Check™ alerts user to potential problems during the calibration process
- Space saving having a pH meter and photometer built into one meter



Supplied Complete

HI83225 is supplied with the HI83300-100 in a rugged carrying case.

Parameter	Range	Resolution	Accuracy	LED (λ nm) with Narrow Band Interference Filter	Method
Ammonia Low Range	0.00 to 3.00 mg/L (as NH ₃ -N)	0.01 mg/L	±0.04 mg/L ±4% of reading at 25 °C	@ 420 nm	Nessler
Ammonia Medium Range	0.00 to 10.00 mg/L (as NH ₃ -N)	0.01 mg/L	±0.05 mg/L ±5% of reading at 25 °C	@ 420 nm	Nessler
Ammonia High Range	0.0 to 100.0 mg/L (as NH ₃ -N)	0.1 mg/L	±0.5 mg/L ±5% of reading at 25 °C	@ 420 nm	Nessler
Calcium	0 to 400 mg/L (as Ca ²⁺)	1 mg/L	±10 mg/L ±5% of reading at 25 °C	@ 466 nm	oxalate
Magnesium	0 to 150 mg/L (as Mg ²⁺)	1 mg/L	±5 mg/L ±3% of reading at 25 °C	@ 466 nm	calmagite
Nitrate	0.0 to 30.0 mg/L (as NO ₃ ⁻ -N)	0.1 mg/L	±0.5 mg/L ±10% of reading at 25 °C	@ 525 nm	cadmium reduction
Phosphate High Range	0.0 to 30.0 mg/L (as PO ₄ ³⁻)	0.1 mg/L	±1 mg/L ±4% of reading at 25 °C	@ 525 nm	amino acid
Potassium	0.0 to 20.0 mg/L (as K)	0.1 mg/L	±3.0 mg/L ±7% of reading at 25 °C	@ 466 nm	turbidimetric tetraphenylborate
Sulfate	0 to 150 mg/L (as SO ₄ ²⁻)	1 mg/L	±5 mg/L ±3% of reading at 25 °C	@ 466 nm	turbidimetric

Ordering Information

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

Standards

HI83325-11 CAL Check Cuvette Kit for HI83325

HI83900

Suction Lysimeter

for Root Level Soil Monitoring

- The perfect companion to the HI83325
- Monitor soil nutrients at the roots

The HI83900 suction lysimeter is built with a porous ceramic cap connected to a transparent tube for soil solution extraction. A rubber capillary is inserted in the tube passing through a rubber cap and reaching the ceramic tip.

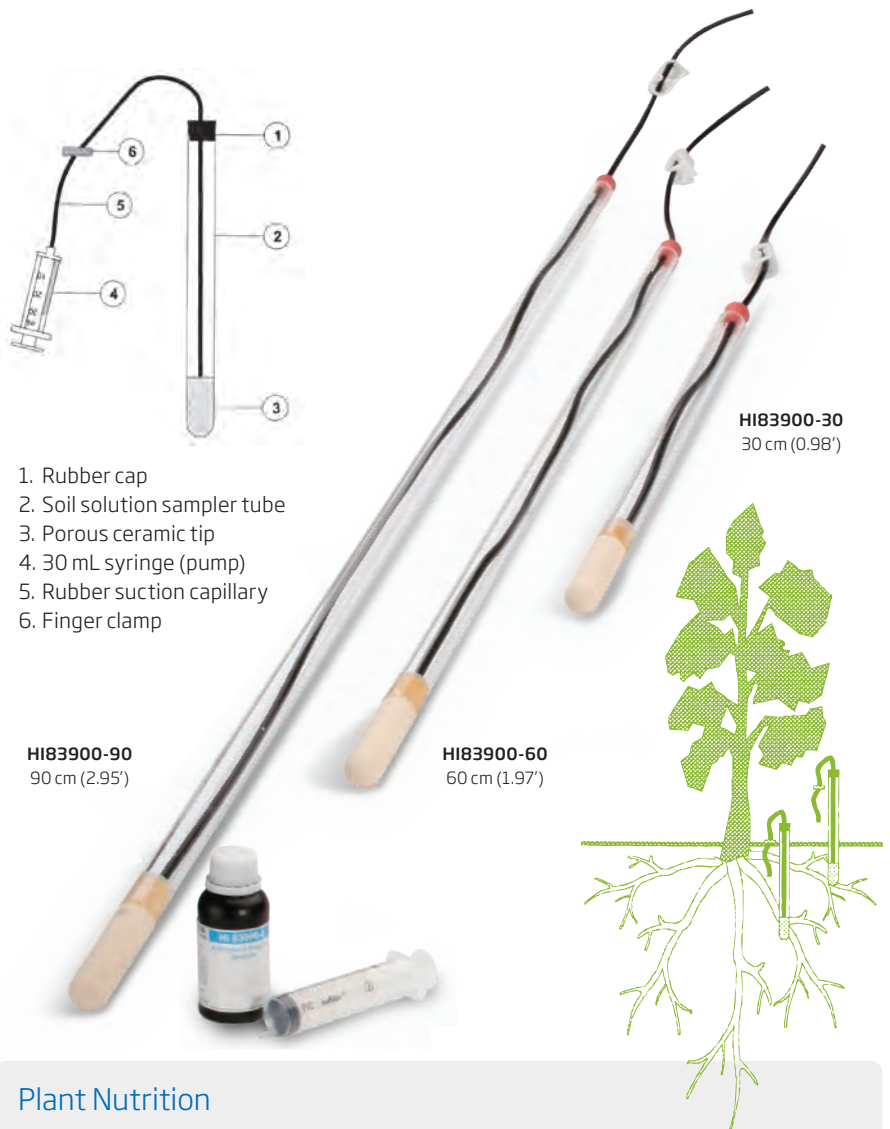
The HI83900 series lysimeter is an ideal tool for collecting soil solution samples and then performing quantitative chemical analysis. In this way, the operator can easily monitor the level of nutrients such as ammonia, nitrate, phosphorous, potassium, sulfate, calcium and magnesium.

The ceramic tip of the lysimeter can be used in all types of soil. It is made of a sinterized material that does not react with the nutrients in the soil. Therefore, the soil solution collected is not affected by the chemical composition of the ceramic cap resulting in precise and reliable tests.

The HI83900 allows the extraction of a solution from the soil by creating a vacuum inside the sampler tube, that exceeds the soil water tension. This will establish an hydraulic gradient for the solution to flow through the porous ceramic cap and into the lysimeter tube. Typically, a vacuum of about -60 cb (centibar) should be drawn.

For better monitoring of soil solution composition throughout an entire growth period of crops, at least two lysimeters should be installed in the root zone of a representative plant, one at the upper part and one in the lower part of the root zone.

For better measurement accuracy and repeatability, it is recommended to replicate installations in at least two more locations.



1. Rubber cap
2. Soil solution sampler tube
3. Porous ceramic tip
4. 30 mL syringe (pump)
5. Rubber suction capillary
6. Finger clamp

HI83900-90
90 cm (2.95')

HI83900-60
60 cm (1.97')

HI83900-30
30 cm (0.98')

Plant Nutrition

The three elements that are most needed by plants are nitrogen (N), phosphorous (P) and potassium (K).

Nitrogen is indispensable for the plant's life and is a key factor in fertilization. Nitrogen allows the development of the vegetative growth of the plant; in particular, it contributes to lengthening of trunks and sprouts and increases the production of foliage and fruits. An excess of nitrogen weakens the plants structure creating an unbalanced relationship between the leaves and the stalks. In addition, the plant becomes less resistant to diseases.

Phosphorous is an important element in the composition of DNA and RNA, the regulators of the energetic exchange (ATP and ADP), as well as the reserve substances in seeds and bulbs. It contributes to the formation of buds, roots, blooming, and lignification. A lack of phosphorous results in: stifling of plants, slow growth, a reduction of production, smaller fruits and a lower expansion of the roots.

Even though potassium is not a constituent of important compounds, it plays a remarkable role in many physiological activities in plants like the control of cellular turgor and the accumulation of carbohydrates. It increases the size of fruits, their flavor, as well as yielding a positive effect on the color and fragrance of flowers. Potassium also makes plants more resistant to disease.

Ordering Information

Accessories

All include capillary rubber tube with rubber cap and finger clamp, cleaning solution starter kit (120 mL), 30 mL syringe and instructions

HI83900-30 is comprised of 30 cm (0.98') sampler tube ending with porous ceramic tip.

HI83900-60 is comprised of 60 cm (1.97') sampler tube ending with porous ceramic tip.

HI83900-90 is comprised of 90 cm (2.95') sampler tube ending with porous ceramic tip.

HI83900-25 cleaning solution kit, 500 mL

HI3896

Hanna Soil Test Kit

The chemical composition of soil includes pH and chemical elements. Soil analysis is necessary for better management of fertilization and to know the residues of fertilizers in relation to the crop, tillage and the most suitable plant choice for soil composition. An analysis can highlight shortages and help the understanding of the causes of an abnormal growth. By using the Hanna soil test, it is possible to measure pH and the most important elements for plant growth: nitrogen (N), phosphorus (P) and potassium (K).

Testing the soil during each crop cycle and comparing the results with plant growth can be a useful information for subsequent cultivations.



Specifications	HI3896 Professional Agriculture Test Kit				
Test	Type	Range	Smallest Increment	Method	Number of Tests
Nitrogen	colorimetric	traces, low, medium, high	–	Ned	25 avg.
Phosphorus	colorimetric	traces, low, medium, high	–	ascorbic acid	25 avg.
pH	colorimetric	4 to 9 pH; 1 pH	–	pH indicator	25 avg.
Potassium	turbidimetric	traces, low, medium, high	–	tetraphenyl-borate	25 avg.
Ordering Information	HI3896 test kit includes 120 mL extraction solution (2), 70 mL pH indicator, 75 powder packets (25 each for N, P & K), 1 mL pipettes (3), test tubes (5), test tube stand, spoon, brush, color cards (4), graduated card and handbook.				
Reagents	HI3896-025 nitrogen, phosphorus, potassium and pH, 25 tests each				

HI3895

Quick Soil Test Kit

Hanna's quick soil test kit provides growers with an economical way to quickly test pH as well as the three basic elements needed for a healthier plant: nitrogen (N), phosphorus (P) and potassium (K).



Specifications	HI3895 Basic Agriculture Test Kit				
Test	Type	Range	Smallest Increment	Method	Number of Tests
Nitrogen	colorimetric	traces, low, medium, high	–	Ned	10 avg.
Phosphorus	colorimetric	traces, low, medium, high	–	ascorbic acid	10 avg.
pH	colorimetric	4 to 9 pH; 1 pH	–	pH indicator	10 avg.
Potassium	turbidimetric	traces, low, medium, high	–	tetraphenyl-borate	10 avg.
Ordering Information	HI3895 test kit includes 40 powder packets (10 each for pH, N, P & K), 1 mL plastic pipette, test tubes (4), color cards (4) and one graduated card.				
Reagents	HI3895-010 nitrogen, phosphorus, potassium and pH, 10 tests each				

T-Logger with Locking Wall Cradle



HI144002 USB docking cradle included with HI144-10

wall cradle

- Compact waterproof data logger
 - LCD displays temperature, high and low alarms, logging status and battery indicator
 - Wall mount with lock
 - USB docking cradle for programming and transferring of data (HI144-10)
- Programming options
 - Choice of start: From the PC, a specific date/time, or push button on T-Logger
 - Choice of measurement units: °C or °F to display on LCD
 - High and low alarm set points with indicators on LCD
 - Selectable logging interval in minutes and hours
 - Choice of data management: Store until full, fixed number or wrap around
- Instrument status review:
 - Battery life and days used
 - Serial number of device
 - Programmed device settings
- PC software (using HI144002 USB docking cradle):
 - Graphic user interface to program settings
 - Data export as an .xls file
 - Built in graphing that can be scaled with quick reference to programmed high and low alarm
- Stores up to 8,000 measurements
- 2-year battery life

The monitoring of temperature is critical through all stages in food distribution. This includes from the time it is packaged and stored to transportation to the local market or restaurant. For cold food storage it is necessary to ensure that the product is always stored properly to maintain quality and for safety to prevent bacteria growth. The HI144-10 will help to be compliant in recording temperatures as part of a HACCP monitoring program.

For building maintenance, this logger can track environmental temperatures of an office or warehouse to ensure that heating or air conditioning thermostats are programmed correctly and hot or cold air is distributed evenly.

Using the supplied PC software HI144-10 can be programmed to record the temperature in intervals from 1 minute to 24-hours and can store up to 8,000 readings.

The HI144-10 is supplied with the HI144 T-Logger, USB cradle, wall mount with lock and software. Additional HI144 T-loggers can be ordered without the cradle and software. Each T-logger has its' own unique serial number to identify individual units.

Specifications	HI144
Range	-30.0 to 70.0°C/-22.0 to 158.0°F
Resolution	0.1°C/0.1°F
Accuracy	±0.4°C (-20 to 60°C); ±0.6°C (outside); ±0.7°F (-4 to 140°C); ±1.1°F (outside)
Calibration	factory-calibrated
Data Logging	up to 8,000 samples
Logging Interval	user selectable, from 1 minute to 24 hours
PC Connectivity	HI144002 docking cradle connected to PC with USB cable and running HI92144 software
Battery Type / Life	CR2032 3V lithium ion / approximately 2 years
Environment	0 to 50°C (32 to 122°F); RH 100% (IP67)
Dimensions	60 x 37 x 17 mm (2.4 x 1.5 x 0.7")
Weight	29.4 g (1 oz.) with battery
Ordering Information	<p>HI144 is supplied with HI144 T-Logger, CR2032 lithium ion battery, wall cradle, lock, and instruction manual.</p> <p>HI144-10 is supplied with HI144 T-Logger, HI144002 USB communication cradle, USB flash drive with HI92144 Windows® compatible software, CR2032 lithium ion battery, wall cradle, lock, and instruction manual.</p>



HANNA

64.0 %RH
24.3 °C

MODE SET
HOLD

Dewpoint
Hygrometer

HI705023

HI9564 · HI9565

Thermo- hygrometers

with Dew Point and Calibration
Data-Logging Probe

- Simultaneous RH and temperature measurements on a large, dual-line LCD display
- Selectable temperature unit (°C or °F)
- HI706023 dedicated temperature and RH probe with electronic sensor



- Quick connect probe
- Battery life indication and low battery detection
- Keystroke confirmation tone
- Auto-off function
- Waterproof casing IP67
- MIN, MAX value and HOLD indicator
- Stability indicator

HI9564 and HI9565 are portable thermo-hygrometers designed to measure temperature and Relative Humidity (RH).

HI9565 presents the added advantage of being able to calculate the dew point from the temperature and RH.

To ensure maximum protection against the effects of humidity and condensation, the instruments are housed in a rugged, water-resistant casing.

The temperature and RH probe is a “smart probe” which consists of a factory calibrated electronic sensor which requires no user calibration.

Our “smart probes” will work with any of our meters without the need to recalibrate as the electronic sensor tracks the performance and stores the calibration history directly onto the probe.



Specifications	HI9564	HI9565
RH	Range	0.0 to 100.0 % RH
	Resolution	0.1 % RH
	Accuracy	±2.5 % RH (0 to 90 % RH); ±3.5 % RH (90 to 100 % RH);
Dewpoint Temperature (HI9565 only)	Range	-20.0 to 60.0°C / -4.0 to 140.0°F
	Resolution	0.1°C / 0.1°F
	Accuracy	±2°C / ±4°F (50 to 85 % RH and 15 to 40°C); ±4.5 °C / ±9 °F (outside)
Temperature	Range	-10.0 to 60.0°C / 14.0 to 140.0°F
	Resolution	0.1°C / 0.1°F
	Accuracy	±0.4 °C / ±0.8 °F
Additional Specifications	Probe	HI706023 RH/temperature probe
	Battery Type / Life	1.5V AAA / 10,000 hours of continuous use
	Auto-off	User selectable: after 8 minutes, 60 minutes or disabled
	Environment	0 to 60 °C (32 to 140 °F); 98 % RH non-condensing
	Dimensions	154 x 63 x 30 mm (6.1 x 2.5 x 1.2")
	Weight	196 g (6.91 oz.)
Ordering Information	HI9564 and HI9565 are supplied with HI706023 RH/temperature probe, 1.5V AAA batteries (3) and instruction manual.	

HI97500

Portable Lux Meter

- Three measurement ranges
- Water-resistant housing
- 200 hour battery life with battery level indicator

The HI97500, is a portable lux meter designed to perform light measurements simply and accurately. The instrument is supplied with a light sensor connected by a fixed 1.5 m coaxial cable to allow measurements to be taken from a distance without any user interference.

By simply pressing the RANGE key, users can switch among three ranges to choose the best resolution according to the environment being tested. The HI97500 lux meter has a rugged and water-resistant body for frequent outdoor use.

The HI97500 features a low battery indicator and automatic shut-off that turns the meter of after 7 minutes of non-use.

Plant Light Requirements

Light provides the energy source needed for plants to manufacture food (photosynthesis). The amount of light is commonly measured in foot-candles (ft-c) or lux. Plants differ greatly in their light intensity requirements. Indoor plants are often classified by the amount of light necessary for growth:

- Low (minimum 1.1 Klx, .8 to 2.1 preferred for good growth)
- Medium (minimum 1.1 to 1.6 Klx, 2.1 to 5.4 preferred)
- High (minimum 1.6 to 10.8 Klx, 5.4 to 10.8 preferred)
- Very high (minimum 10.8 Klx, 10.8+ preferred)

About 1.1 Klx for 12 hours per day are necessary simply to maintain plant quality for one year and at least 2.1 Klx for 12 hours per day are necessary for foliage plants to manifest any benefit from fertilization.

While lack of sufficient light results in poor plant growth, too much light can also be harmful. Shade plants cannot tolerate excessively high light levels. When a plant receives too much direct light, the leaves bleach or scald, sometimes dying. This often happens after moving a plant outdoors in direct light. Any changes in light intensity should be gradual.

The Quality of Light

Quality of light is very important in agriculture. Too little light (or luminous intensity) affects the quantity and quality of crop performance.

Luminous intensity is measured and reported in foot-candles (ft-c) or in lux (lx). One lux is equal to one lumen per square meter and one foot-candle is equal to one lumen per square foot. To convert measurements use the following formula:

$$\text{foot-candle} = \text{lux} \times 0.0929$$

$$\text{lux} = \text{foot-candle} \times 10.764$$



Specifications HI97500

Range	0.001 to 1.999 Klux 0.01 to 19.99 Klux 0.1 to 199.9 Klux
Resolution	0.001 Klux 0.01 Klux 0.1 Klux
Accuracy	±6% of reading ±2 digits
Sensor	human-eye-response silicon photodiode with 1.5 m coaxial cable (fixed)
Battery Type / Life	9V / approximately 200 hours of continuous use; auto-off after 7 minutes of non-use
Environment	0 to 50°C (32 to 122°F); RH 100%
Dimensions	164 x 76 x 45 mm (6.5 x 3.0 x 1.8")
Weight	180 g (6.3 oz.)
Ordering Information	HI97500 is supplied with battery, protective case and instructions.
Accessories	HI710015 blue shockproof rubber boot



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